DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL SUBSTATIONS

FORT VERMILION, ALTA.
FORT SMITH, N.W.T.
FORT RESOLUTION, N.W.T.
FORT PROVIDENCE, N.W.T.
SALMON ARM, B.C.
BETSIAMITES, QUE.
FORT GOOD HOPE, N.W.T.

REPORT OF THE EXPERIMENTALISTS IN CHARGE

FOR THE YEARS 1927 AND 1928

Published by authority of the Hon. W. R. Motherwell, Minister of Agriculture, Ottawa, 1929

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FORT VERMILION, ALBERTA

REPORT OF THE SUPERINTENDENT, ROBERT JONES

THE SEASONS OF 1927 AND 1928

April, 1927, was quite a cold month. Fields were bare of snow about May 7, and wheat seeding was general on the 13th. June was characterized by high temperatures and continued high winds and a precipitation much below average. Precipitation was well distributed throughout July and this combined with warm weather and considerable sunshine provided excellent growing conditions. Dry hot weather lasted throughout August and until September 11, after which the weather became cooler with frequent heavy showers. Fall work throughout the district was well in hand before the freeze-up came on October 22.

Fall-sown crops winter killed very badly throughout the district during the winter of 1927-28. Winter wheat was a total loss. This severe winter killing was due mostly to the lack of snow, which was melted by the frequent chinook winds. It was necessary to reseed a large proportion of the new 1927 series of grass, clover and alfalfa plots.

The season of 1928 was featured by high winds and a smaller amount of precipitation than usual. The result of two successive dry seasons was that the land became abnormally dry. The temperature was lower than usual throughout the whole growing season.

Wheat seeding throughout the district was not general until May 7. By the middle of May the land had become rather dry, causing a slow germination of all crops, and growth was irregular throughout the season. The yield of all grain crops was much below the average. The extremely dry weather resulted in the rapid ripening of all crops and harvest was considerably earlier than usual. Prelude wheat was cut on July 26, Reward on July 30, Garnet on August 6, and Red Fife on August 14. The first variety of oats cut was Eighty Day, on July 26. Chancellor peas were cut on July 30 and a new variety of barley, Star, was fully matured and cut on July 23, just 82 days from the time of seeding.

Corn and sunflower crops were poor and their feeding value much impaired by frost. The root crops were average. Conditions in July were very favourable for haymaking, and although the yields of grasses were low the quality was excellent.

TABLE OF METEOROLOGICAL OBSERVATIONS TAKEN AT FORT VERMILION, PEACE RIVER DISTRICT, ALBERTA FROM APRIL 1, 1927 TO MARCH 31, 1928

—	Maximum	Minimum	Range	Mean	Highest	Date	Lowest	Date	Rainfall	Snowfall	Total precipitation	Number of days precipitation	Heaviest in 24 hours	Date
	°F.	°F.	°F.	°F.	°F.		°F.		ins.	ins.	ins.		ins.	
April.....1927	41·3	14·2	27·1	27·7	62·0	12	—18·0	1	0·50	5·0	1·00	6	0·90	27
May..... "	61·5	34·1	27·4	48·8	75·9	22	19·0	2	0·31	–	0·31	4	0·17	15
June..... "	70·2	44·9	25·3	57·5	79·5	14	32·5	4	1·21	–	1·21	6	0·38	18
July..... "	75·8	50·2	25·6	63·0	93 5	24	35·0	31	1·86	–	1·86	14	0·37	8
August..... "	77·0	44·9	32·1	60·9	89·2	10	34·0	7–20	0·27	–	0·27	3	0·13	26
September..... "	58·3	34·2	24·1	46·2	79·0	10	19·0	19	1·56	–	1·56	6	0·68	12
October..... "	44·7	23·1	21·6	33·9	59·9	1	8·8	31	0·54	–	0·54	7	0·25	20
November..... "	3·6	—15·2	18·8	— 3·9	32·2	2	—43·8	30	–	2·5	0·25	2	0·20	25
December..... "	— 5·3	—26·9	21·6	—16·1	16·0	18	—59·0	31	–	7·0	0·70	7	0·30	23
January.....1928	14·0	—11·9	25·9	— 0·3	46·0	7	—56·4	1	–	3·2	0·32	4	0·10	4
February..... "	25·0	— 8·8	33·8	8·3	44·0	17	—38·5	21	–	2·5	0·25	2	0·15	13
March..... "	28·7	0·8	27·9	15·0	62·0	18	—33·9	7	–	4·5	0·45	5	0·25	23
									6·25	24·70	8·72	66		

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

April 1927–March 31, 1928	Mean temperature	Highest temperature	Lowest temperature	Total precipitation	Heaviest in 24 hours	Total hours sunshine	Average sunshine per day
	°F.	°F.	°F.	ins.	ins.		
April—							
Ottawa	42·7	79	17	0·85	0·34	248·2	8·27
Fort Vermilion	27·7	62·0	−18·0	1·90	0·90	179·0	5·9
May—							
Ottawa	53·0	86	28	5·05	1·03	169·5	5·47
Fort Vermilion	47·8	75·9	19·0	0·31	0·17	292·2	9·4
June—							
Ottawa	60·1	87	37	4·37	1·23	298·9	9·9
Fort Vermilion	57·5	79·5	32·5	1·21	0·38	247·0	8·2
July—							
Ottawa	67·2	84	46	4·76	1·65	269·1	8·68
Fort Vermilion	63·0	93·5	35·0	1·86	0·37	273·3	8·8
August—							
Ottawa	63·0	83	42	2·44	0·74	247·7	8·25
Fort Vermilion	60·9	89·2	34·0	0·27	0·13	310·2	10·0
September—							
Ottawa	59·2	80	34	1·62	0·68	180·3	6·3
Fort Vermilion	46·2	79·0	19·0	1·56	0·68	157·7	5·2
October—							
Ottawa	49·3	79	24	1·95	0·50	136·3	4·3
Fort Vermilion	33·9	59·9	8·5	0·54	0·25	116·2	3·7
November—							
Ottawa	34·8	67	13	7·76	1·42	41·7	1·39
Fort Vermilion	5·8	32·2	−43·5	0·25	0·20	81·5	2·7
December—							
Ottawa	21·1	45	− 6	3·09	1·07	68·7	2·21
Fort Vermilion	−15·9	16·0	−59·0	0·70	0·30	57·1	1·8
January—							
Ottawa	14·2	39	−20	3·78	1·30	70·1	2·26
Fort Vermilion	1·0	46·0	−56·4	0·32	0·10	71·0	2·2
February—							
Ottawa	13·1	38	−25	1·51	0·58	114·1	3·93
Fort Vermilion	8·1	44·0	−38·5	0·25	0·15	113·8	3·9
March—							
Ottawa	23·5	49	−10	2·49	0·46	148·7	4·79
Fort Vermilion	14·7	62·0	−33·9	0·45	0·25	143·7	4·6

RECORD OF SUNSHINE AT FORT VERMILION, PEACE RIVER DISTRICT, ALBERTA, FROM APRIL 1, 1927 TO MARCH 31, 1928

Months	Days with sunshine	Days without sunshine	Total hours sunshine	Average sunshine per day
				hours
1927				
April	25	5	179·0	5·9
May	31	0	292·2	9·4
June	26	4	247·0	8·2
July	28	3	273·3	8·8
August	31	0	310·2	10·0
September	22	8	157·7	5·2
October	25	6	116·2	3·7
November	23	7	81·5	2·7
December	16	15	57·1	1·8
1928				
January	22	9	71·0	2·2
February	22	7	113·8	3·9
March	26	5	143·7	4·6

HORTICULTURE

The season of 1927 was unfavourable for horticultural work, the spring being very late and cold and the summer too dry. All fruit trees, small fruit bushes and strawberries suffered greatly from the severe winter cold and lack of snow protection, and there was a light setting of fruit blooms. The light showers in July were not very beneficial and August was extremely dry. The yields of vegetables were consequently poor. For the first time in many years, grasshoppers caused much damage on the Station.

Weather conditions in 1928 were not favourable, a dull cold spring being followed by a comparatively short and extremely dry summer. Early and severe autumn frosts made it impossible to gather seed from many varieties of vegetables or flowers. The only success in gardening in 1928 was obtained on land summer-fallowed the previous season.

VEGETABLES

ASPARAGUS

This early vegetable succeeds very well under these northern conditions. Each autumn the rows are covered with one foot of well-rotted barnyard manure which is worked into the soil in the spring. After the first cultivation in the spring a fairly liberal application of salt is placed along the rows. Conovers Colossal is the main variety grown. In 1928 cuttings were made from May 22 to June 30.

BEANS

Ten varieties and strains of beans were grown in 1927 and thirteen in 1928. In 1928 a severe frost occurred on August 19, after which no further growth of beans was made. The following table gives the results obtained in the two years:—

BEANS—RESULTS OF VARIETY TESTS

Varieties and source	Date ready for use		Yield of ripe seed from 33 foot row in 1927	Yield of green pods from 33 foot row in 1928
	1927	1928		
			lb.	lb.
Davis White Wax 0.2772	July 14	July 26	2·0	6·0
Wardwell Kidney Wax 0.2823	" 18	" 27	1·5	7·5
Plentiful French 0.2824	" 30	" 25	0·75	6·75
Stringless Green Pod 0.2747	.....	" 30	.....	7·0
Princess of Artois 0.9388	July 18	Aug. 3	1·50	3·5
Masterpiece 0.2746	.....	July 27	.....	7·5
Extra Early Red Valentine 0.1479	July 20	Aug. 1	1·25	8·0
Improved Golden Wax	.....	" 10	.....	4·5
Round Pod Kidney Wax 0.5232	.....	July 27	.....	8·0
May Queen 0.8954	.....	Aug. 6	.....	5·0
Round Pod Kidney Wax 0.1638	July 20	July 25	2·5	4·5
Stringless Green Pod 0.5405	.....	Aug. 6	.....	6·0
Yellow Eye Yellow Pod 0.2821	July 17	July 29	1·75	5·0
Bountiful Bush 0.2825	Aug. 10	.....	0·0	.....
Challenge Black Wax 0.592	July 29	.....	0·75	.....
No. 1 Pole Bean 0.5964	" 27	.....	0·75	.....

Extra Early Red Valentine and Davis White Wax are good varieties for this district.

BEANS—CULTURAL TEST

An experiment to determine the best distance apart to plant beans in the rows has been conducted for several years. Two varieties were used in the experiment in 1927 and four in 1928, the seed being spaced 2, 4 and 6 inches

apart. In 1927, the four-inch spacing gave the best results while in 1928 the heaviest yields were from the 2-inch spacing. In 1927 Stringless Green Pod ripened. In 1928 the seed was planted on May 15, but none of the varieties used reached maturity. There was, however, an abundant yield of green pods.

BROAD BEANS

In 1927 eleven varieties were used. Germination was good, and growth strong until midsummer when grasshoppers caused considerable damage, reducing the yields. All the varieties were harvested, fully matured, on September 6.

In 1928 the beans were planted on May 18. Growth was vigorous, and a large quantity of green beans were picked from July 26 to August 19. A severe frost on the latter date stopped all further growth. The results in 1927 are given in the following table:—

BROAD BEANS—RESULTS IN 1927

Varieties	Date ready for use	Yield of ripe seed from two 33 foot rows
		lb.
Sharpe Conqueror	Aug. 1	12·0
Giant Four Seeded	" 1	9·5
Dwarf or Cluster	" 1	10·0
Green Windsor	" 2	11·5
Taylor Windsor	" 3	13·0
Windsor Common	" 1	8·75
Early Mazagan	" 1	10·5
Mammoth Broad Windsor	July 30	12·75
Harlington	" 30	9·75
Broad Windsor	Aug. 1	13·0
Long Green Pod	" 2	12·5

All of the above varieties are quite hardy, and very suitable for this northern district.

GARDEN BEETS

Seven varieties of table beets were grown in 1927. Germination was good and growth was satisfactory throughout the season. Some fairly heavy yields were obtained.

In 1928 four varieties were sown on May 14, and growth was good throughout the season. The plots were thinned on July 4 to 4, 6 and 8 inches, with one plot left unthinned. All the yields were very good, but the roots obtained from the 4-inch spacing and from the unthinned plot were much superior in quality to those from the wider-spaced plots.

In 1927 Crimson Globe, Crosby Egyptian and Early Flat Red gave the highest yields. The yields in 1928 were as follows:—

GARDEN BEETS—RESULTS IN 1928

Varieties and source	Distance apart	Size when harvested	Quality	Yield per acre
	in.			tons lb.
Early Eclipse (Firth)	4	Very large..	Medium....	26 800
Crimson Globe (Graham)	6	Extra large.	Coarse.....	29 200
Crosby Egyptian (Steele Briggs)	8	"	Medium....	27 1,800
Detroit Dark Red (Rennie)	Unthinned..	Medium....	Fair.....	20 1,680

Detroit Dark Red, Crosby Egyptian and Crimson Globe are recommended for the district.

BRUSSELS SPROUTS

One variety of Brussels sprouts, New Giant (Rennie), was tested in 1928. The plants were set out from the hotbeds on June 1, and the crop was harvested on September 20. While the sprouts were small, they were solid and of a very good quality.

TABLE CARROTS

Eight varieties or strains of table carrots were sown in 1927, on May 10, 14 and 23. Growth was good and fair yields were harvested on September 14. Some of the carrots sown on May 10 were ready for use as early as July 4.

In 1928 carrot seed was sown on May 14. The different varieties were ready for table use on July 12 and 14 when the plants were thinned to 3 inches apart. Splendid crops were obtained on September 13. The details for 1928 are given in the following table:—

TABLE CARROTS—RESULTS OF VARIETY TEST IN 1928

Varieties and source	Size when harvested	Quality	Yield per acre	
			tons	lb.
Nantes Half Long (Rennie)	Very large	Good	24	1,200
Chantenay Ott. 8932	Quite large	Very good	24	—
Selected Chantenay (McDonald)	Fair	Good	22	1,000
Oxheart (McDonald)	Medium	Very fine	21	240
Danvers Half Long (Rennie)	Small	Excellent	17	1,760
Champion Scarlet Horn (Patmore)	Medium	Very good	19	1,240
Favourite (Patmore)	Medium	Very good	18	600

Chantenay, Half Long Danvers, and Nantes Scarlet Half Long are recommended for the district.

CABBAGE

The weather in 1927 was not favourable for cabbage growing and below average yields were obtained at harvest on September 5.

Weather conditions in 1928 were much more favourable for cabbage. Nine varieties or strains were sown in hotbeds on April 24, and transplanted on June 1, in drills 2½ feet apart with the plants 30 inches apart in the drills. Strong growth was maintained throughout the season and excellent yields were harvested on September 20. The details of the results in 1928 are given in the following table:—

CABBAGE—TEST OF VARIETIES

Varieties and source of seed	Date ready for table use	Size	Number used during the season	Number harvested	Average weight	Quality
					lb.	
Early Paris Market (McDonald)	July 19	Fair	45	3	7	Very good.
Early Jersey Wakefield (McDonald)	" 20	Medium	40	8	6	Very fine.
Dala (McDonald)	Aug. 1	Fair	None	48	10	Very solid, good.
Danish Ballhead (Steele Briggs)	" 3	Medium	None	48	9	Very firm.
Brandon Market (McKenzie)	" 3	Large	None	48	12	Very solid.
Copenhagen Market (Graham)	" 2	Medium	None	48	14	Very large, good.
Express (Bruce)	July 22	Small	35	13	5	Medium.
Kildonian (Steele Briggs)	Aug. 2	Medium	None	48	13	Very good.
Mammoth Red Rock (Rennie)	" 15	Small	20	28	2	Poor.

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Jersey Wakefield and Early Paris Market gave very good yields for early maturing varieties, and were of a good quality, while the Copenhagen Market is a medium early variety, a heavy yielder, and an excellent keeper.

Both Dala and Kildonan are main crop varieties, and both possess excellent keeping qualities, while the variety Danish Ballhead was not quite up to its usual size, its quality was of the best.

CABBAGE—OUTSIDE PLANTING

An experiment to compare hotbed with outside seeding of cabbage has been conducted at this Station for a number of years. In 1927 the season was unfavourable and the results much in favour of the hotbed seeding, even considering the higher cost of production.

In 1928, thirteen varieties of cabbage were sown direct on the open ground on May 15 in drills 24 inches apart, and the plants were thinned to 20 inches apart in the rows on June 19. The 1928 season proved to be particularly favourable for the cabbage sown in the open, and the yields almost equalled those of the hotbed sowings. Sowing cabbage in the open, however, is not recommended for this north land on account of the danger from late spring frosts.

CHINESE CABBAGE

In 1927 two varieties of Chinese cabbage, Pe-Tsai (Ewing) and Wong-Bok (McDonald) were sown on May 10. The former was ready for use on June 3 and the latter on June 5. While germination was good, the plants did not make the usual strong growth and were inclined to run to seed early.

In 1928 these cabbages were ready for use on June 12 and provided green vegetables when other vegetables were scarc.

CAULIFLOWER

Two varities of cauliflower were tested in 1927, but on account of weather conditions and damage from grasshoppers the yields were much below the average.

In 1928 four varieties were sown under glass on April 24 and transplanted on June 1. An excellent stand was obtained and growth was good. While the size of the heads was only medium, they were very compact and of excellent quality. The following table gives the results for 1928:—

CAULIFLOWER—RESULTS OF VARIETY TEST IN 1928.

Varieties and Source	Ready for use	Weight when ready for use	Number used during season	Number harvested	Average weight when harvested	Quality
		lb.			lb.	
Extra Early Dwarf Erfurt (McDonald)	July 20...	3·0	40	8	7	Very finest.
Dwarf Snowball (Madson)	" 18...	1·5	35	13	5	Very good.
Early Snowball (Graham)	" 19...	3·0	30	8	7	Excellent.
Danish Perfection (Madson)	" 20...	2·0	32	16	5	Exceedingly good.

CAULIFLOWERS—OUTSIDE SEEDING

In 1928, for the first time, cauliflowers were sown outside. The sowing was done on May 15, and the plants thinned to 20 inches apart on June 19. The variety used was Danish Perfection, and the heads were ready for table use on August 1. Their quality was fair.

CELERY

In 1927 the celery seed was sown in hotbeds on April 1 and transplanting was done on May 20. Owing to lack of moisture and damage by grasshoppers, the crop was light. Three methods of blanching were tested in 1927: hilling up with earth; wrapping the stocks with paper; and putting boards alongside of the rows of plants. In this season, which was a very dry one, the best blanched celery was obtained from the plants hilled up with earth. There was very little difference in the results obtained from the other two methods. The hilling up method is a protection from the sun and from early fall frosts.

Seven varieties or strains of celery and one of celeriac were tested in 1928. As usual the hilling up method resulted in the best celery. The details for the two years are given in the following table:—

CELERY—RESULTS OF VARIETY TEST

Varieties and sources	Ready for use		Weight per dozen plants		Length of plants		Quality	
	1927	1928	1927	1928	1927	1928	1927	1928
			lb.	lb.	ins.	ins.		
Golden Self Blanching Ott. 3410...	Aug. 23	Aug. 5	12	10	10	15	Good	Well blanchsd.
Fordhook Emperor (Schell).....	"	" 5	.....	10	.....	14	"	"
Golden Plume (Graham).....	"	" 5	.....	12	.....	15		Fine.
Giant Pascal (Graham).....	" 29	" 10	14	14	13	16	Very good	Fair..
Easy Blanching (McDonald).....	"	" 7	.....	11	.....	13	.....	Good.
Paris Golden Yellow (D & F).....	"	" 7	.....	13	.....	9	.....	Well blanched.
Rose Ribbed (Bruce).....	"	" 10	.....	13	.....	17	.....	"
Paris Ross Red (McDonald).....	Sept. 1	.....	11	.....	12	.....	Fair	
Garr Easy Blanching (Graham)...	Aug. 30	.....	12	.....	15	.....	Good.	
Celeriac, Early Smooth.....	.....	Aug. 15	.....	9	.....	12	.....	Fair.
Celeriac, Large Smooth.....	Aug. 28	.....	15	.....	14	.....	Very good.	

GARDEN CORN

Twenty-four varieties or strains of garden corn were tested in 1927 and twenty in 1928. The land used in 1927 had carried a root crop the previous season. Planting was done from May 18 to 20. Growth was fair throughout the season, weather conditions, apart from precipitation, being favourable. All varieties matured sufficiently for table use, and the crop was harvested on September 6.

The land used in 1928 was a heavy dark loam three feet deep that had been summer-fallowed the previous season and on which twenty large wagon loads of well-rotted manure had been applied in June, 1927, previous to ploughing. This fertilizer was thoroughly incorporated with the soil by the liberal use of the spring tooth harrow. Germination of the corn in the spring of 1928 was good, but owing to the extremely dry season growth was retarded and less vigorous than usual. Only ten varieties were ready for table use on August 28. Suckering did not result in any apparent advantage.

The data for the two years are given in the following tables:—

GARDEN CORN, RESULTS OF TESTS OF VARIETIES, 1927

Variety and source of seed	Date planted	Date of emergence	Percent germination	Date in tassel	Date in silk	Date ready for use	Length of stalk	Yield fodder per acre
							ins.	tons lb.
Alpha (Ferry)	May 18	May 31	90	July 27	Aug. 4	Sept. 4	52	11 800
Alpha (Harris)	" 18	" 30	90	" 28	" 3	" 1	51	5 800
Assinaboine (Wills)	" 18	" 25	100	" 27	" 8	Aug. 24	50	18 -
Extra Early Adams (Ferry)	" 18	June 2	75	" 23	July 26	" 24	54	4 100
Golden Bantam (Moore)	" 18	" 2	80	" 28	Aug. 10	" 18	54	15 360
Golden Bantam (McDonald)	" 18	" 2	75	" 28	" 11	" 28	62	12 -
Early June (Wills)	" 18	" 1	75	" 27	" 11	" 21	52	10 1,000
Early Mayflower (McDonald)	" 18	May 26	100	" 27	" 7	" 30	51	4 400
Imp. Early Dakota (Wills)	" 19	" 28	100	" 26	" 4	" 31	50	11 1,460
Improved Squaw (Wills)	" 19	" 28	100	" 26	" 5	Sept. 2	52	6 80
Gehu (Wills)	" 19	" 28	100	" 25	" 8	" 3	64	10 1,540
Golden Tom Thumb (Wills)	" 19	" 28	85	" 22	July 27	Aug. 19	50	4 1,500
Sixty Day Makegood (Childs)	" 19	June 1	90	" 25	Aug. 8	" 20	56	6 1,200
Malakoff (Vaughan)	" 19	" 2	75	" 27	" 14	" 29	45	10 400
Whipple Early (Harris)	" 19	May 31	80	Aug. 2	" 16	Sept. 6	60	6 800
Early Cory (Graham)	" 20	June 8	80	" 5	" 12	" 2	76	16 1,000
Early Cory (McDonald)	" 20	" 6	75	" 3	" 12	" 4	68	13 1,200
Early Cory (Moore)	" 20	" 6	75	" 1	" 10	" 19	52	9 380
Peep-O-Day (Schell)	" 20	May 26	100	July 3	" 6	Sept. 6	52	4 1,000
Early Malcolm, 0-8988-9006	" 20	June 3	85	" 27	" 8	" 6	52	5 1,400
Banting, O. 1926 strain	" 20	May 31	80	" 23	July 27	" 1	38	6 1,360
Pickaninny 0-6579-1926 strain	" 20	" 30	85	" 22	" 25	Aug. 22	36	2 1,150
Native Squaw (McKenzie)	" 20	" 25	100	" 15	" 22	Sept. 6	60	10 1,000
Mixed Garden Varieties	" 20	" 29	100	" 20	Aug. 6	" 6	52	9 240

GARDEN CORN—RESULTS OF TEST OF VARIETIES, 1928

Variety and source	How planted	Date in tassel	Date in silk	Height of plant when cut	Yield of cobs from plots	Total yield of fodder per acre
				in.	lb.	tons lb.
Banting O-6854	Hills	July 17	July 27	35		4 1,600
Banting O-6854	Drills	" 17	" 27	33		5 560
Early Malcolm (C.E.F.)	Hills	" 25	No silk	34		7 1,360
Early Malcolm (C.E.F.)	Drills	" 25	"	32		8 800
Sixty Day Makegood (Childs)	Hills	" 18	Aug. 8	42		9 720
Sixty Day Makegood (Childs)	Drills	" 18	" 8	36		11 1,040
Alpha (Harris)	Hills	" 17	July 27	32		7 1,840
Alpha (Harris)	Drills	" 17	" 27	29		11 80
Golden Bantam (McDonald)	Hills	" 24	No silk	35		9 240
Golden Bantam (McDonald)	Drills	" 24	"	44		13 880
Extra Early Cory (McDonald)	Hills	" 27	"	41		11 80
Extra Early Cory (McDonald)	Drills	" 27	"	39		13 400
Malakoff (Vaughan)	Hills	" 29	Aug. 8	41		6 1,440
Malakoff, (Vaughan)	Drills	" 29	" 8	38		12 1,920
Pickaninny, (C.E.F.)	Hills	" 16	July 26	37	176	5 560
Pickaninny, (C.E.F.)	Drills	" 16	" 26	37	136	6 480
Early Mayflower, (McDonald)	Hills	July 27	No silk	52		10 640
Early Mayflower, (McDonald)	Drills	" 27	"	52		12 1,440
Early June (Wills)	Hills	" 18	Aug. 4	40		7 880
Early June (Wills)	Drills	" 18	" 4	40		12 .....
Imp. Squaw, (Patmore)	Hills	" 16	July 27	40	96	11 1,040
Imp. Squaw, (Patmore)	Drills	" 16	" 27	39	112	15 1,680
Gills Early Market (Harris)	Hills	" 22	" 30	42	128	6 480
Gills Early Market (Harris)	Drills	" 22	" 30	42	136	9 1,200
Extra Early Adams (Ferry)	Hills	" 18	" 23	43	128	6 .....
Extra Early Adams (Ferry)	Drills	" 18	" 23	43	160	9 720
Tom Thumb Pop (Wills)	Hills	" 22	" 30	33	.....	6 960
Tom Thumb Pop (Wills)	Drills	" 22	" 30	33	.....	7 1,840
Golden Sunshine (Wills)	Hills	" 22	Aug. 6	44	.....	6 .....
Golden Sunshine (Wills)	Drills	" 22	" 6	44	.....	13 400
Gehu, (Wills)	Hills	" 22	" 7	55	.....	11 560
Gehu, (Wills)	Drills	" 22	" 7	55	.....	19 400
Assinaboine, (Wills)	Hills	July 23	Aug. 9	52	.....	12 .....
Assinaboine, (Wills)	Drills	" 23	" 9	52	.....	17 1,040
Squaw (McKenzie), Dark seed from the 1927 crop	Hills	" 17	July 26	49	.....	11 1,520
Squaw, (McKenzie) Dark seed from the 1927 crop	Drills	" 17	" 26	49	.....	15 1,200
Squaw, (McKenzie) yellow seed from the 1927 crop	Hills	" 17	" 26	52	.....	12 480
Squaw, (McKenzie) Yellow seed from the 1927 crop	Drills	" 17	" 26	52	.....	15 240
Howe Alberta Flint Seed from the 1927 crop	Hills	" 16	" 27	36	152	6 1,440
Howe Alberta Flint Seed from the the 1927 crop	Drills	" 16	" 27	36	176	14 320

CUCUMBERS

Seven varieties of cucumbers were planted on May 16, 1927. Growth was poor on account of the dry season, but a fair crop was harvested on September 5.

In 1928 weather conditions were very unfavourable for this vegetable. The crop was gathered on August 20, as all the vines had been killed by the severe frost of the previous day. Boston Pickling, Early Russian, Giant Peru, Arlington White Spine, Long Green, and Early Fortune were the varieties tested.

EGG PLANT

One variety, Black Beauty (Steel Briggs), was sown under glass on April 24, 1928, and was transplanted on June 4. A fair growth was made during the season and there was considerable fruit of a fair size when the plants were ruined by frost on August 19.

HERBS

A number of herbs were successfully grown in 1927 and 1928. While some of the varieties used are perennials, they cannot withstand the severe winter sufficiently to produce any growth in the following season. The following are the herbs tested: Sage, dill, summer savoy, caraway, sweet marjorum, catnip, balm, borage, basil sweet, fernel, thyme, hyssop, and horehound.

KOHL RABI

In 1927 the two strains of this vegetable tested made slow growth and produced small crops. In 1928 kohl rabi did very well and an exceptionally large crop of excellent quality was harvested on September 20. The yields in 1928 were: Purple Vienna, 28 tons 160 pounds per acre, and White Vienna, 26 tons 1,760 pounds.

LETTUCE

Eleven varieties and strains of lettuce were tested in 1927. They were sown on May 5, 10 and 23, the first date giving the best results.

In 1928, six varieties were sown on May 14, and a second seeding was made on June 16. From the second seeding excellent results were obtained. Grand Rapids proved to be a very reliable variety, and excellent results were obtained with Iceberg and Early Paris Market, O-380.

ONIONS

In 1927 the onion seed was sown between May 10 and 23, and the percentage of germination was very high. Growth was slow on account of lack of moisture and the yields were moderate. All varieties were harvested in excellent condition on September 13. A plot of Red Wethersfield was sown very thickly on May 23 for the production of sets. The plot was not thinned and very satisfactory results were obtained, the yield being at the rate of 280 bushels per acre.

Onion seed was sown on May 15 in 1928. Growth was slow throughout the season. The plants were thinned to 3 inches apart on July 15, when most of the varieties were ready for use as green onions. The crop was harvested on September 6.

In 1927 the highest yielding varieties were: Yellow Globe Danvers (Lethbridge), 17,400 pounds per acre; Large Red Wethersfield, 16,500 pounds; Yellow Globe Danvers (O-6693), 15,000 pounds; and Giant Yellow Prizetaker (Steel Briggs), 12,600 pounds.

In 1928, Early Flat Red (Graham), Large Red Wethersfield and Ebenezer gave the best yields.

Onion sets were planted on May 12 in 1927, 3 inches apart in the rows. They were ready for use on July 15. Red sets yielded 126 bushels per acre and yellow sets 136 bushels.

In 1928 the sets were planted on May 15. Growth was slow on account of lack of moisture and the yields disappointing.

PARSLEY

The varieties tested in 1927 were Fine Triple Curled (Steel Briggs), Perfecta (McDonald), Champion Moss Curled (McDonald), and Turnip Rooted (Steele Briggs), all of which are quite suitable for this district.

In 1928, two varieties, Moss Curled (Ewing) and Perfecta (McDonald), were sown on May 15. Both varieties produced a good growth of finely curled leaves and were ready for use on July 20.

PARSNIPS

Parsnip seeding was done in 1927 on May 10, 16 and 23, the best results being obtained from the first seeding. The varieties tested yielded as follows: Hollow Crown (Steele Briggs), 14 tons 980 pounds per acre; Guernsey (Steele Briggs), 14 tons 1,340 pounds; Elcombe Giant, 13 tons; and Hollow Crown (O-8691), 12 tons 480 pounds.

Other strains of the same four varieties were used in 1928 and despite the dry season, the yields, size and quality were quite up to the usual standard.

GARDEN PEAS—TEST OF VARIETIES

In 1927 twelve varieties of garden peas were planted. Germination was uniform and fair growth was made.

In 1928 the seed was sown on May 17. The seed used was from the 1927 crop of the Station but had been originally supplied from the Horticultural Division, Ottawa, and other sources. The data for the two years are given in the following table:—

Garden Peas—Results of Test of Varieties

Varieties and source	Ready for use		Length of vine		Length of pod		Size of peas		Yield of green peas	Yield of ripe peas	
	1927	1928	1927	1928	1927	1928	1927	1928	1927	1927	1928
			in.	in.	in.	in.			lb.	lb.	lb.
Lincoln (Invermere)	.....	July 15	.....	20	.....	2	.....	Large	.....	.....	3¾
Alaska (D & F)	July 8	" 12	23	25	2	2	Medium	Medium	6¾	3	2
Little Marvel (Rennie)	" 15	" 15	32	16	2½	2	Small	Large	6½	2¾	3
Early Morn (Gregory)	" 11	" 14	38	36	3½	2½	Small	Large	6	3	2¾
Pioneer (Gregory)	" 13	" 10	24	23	4	2¼	Large	Medium	7¾	3½	3
Gradus (O-2348)	" 15	" 15	42	27	3	2½	Small	Small	9½	4½	2¾
English Wonder (O-8511)	.....	" 13	.....	15	.....	2½	.....	Large	.....	.....	3¾
American Wonder (O-3332)	.....	" 13	.....	21	.....	1¾	.....	Medium	.....	.....	4
Gregory Surprise x English Wonder (O-8627)	.....	" 14	.....	30	.....	2	.....	Large	.....	.....	3
Gradus x American Wonder (0-8624)	.....	" 14	.....	40	.....	2	.....	Large	.....	.....	2¾
Gradus x English Wonder (0-8471-3)	.....	" 14	.....	30	.....	2	.....	Large	.....	.....	5
English Wonder (0-8622)	July 18	" 16	16	16	2½	2	Medium	Large	9½	4¾	4
Laxtonian (Graham)	" 12	" 12	23	18	3½	3	Large	Large	10¾	4¾	2½
Thomas Laxton (McDonald)	" 11	" 10	52	28	3	2	Very Large	Large	11	5½	2¾
Advancer (Harris)	" 16	" 18	20	31	2	2¾	Medium	Large	5	3¾	4
Stratagem (Graham)	" 25	" 14	28	28	3	3½	Large	Large	7½	3	3
Lincoln (Sharp)	" 27	.....	22	.....	3	.....	Large	.....	11	5½	
Prosperity (Rennie)	" 9	.....	50	.....	3½	.....	Large	.....	10½	4½	

GARDEN PEAS—CULTURAL TEST

An experiment is being conducted to determine the best distance apart in the rows to plant garden peas. In both 1927 and 1928 the difference in spacing had very little effect on the dates when the peas were ready for use, or on the dates of ripening, but slightly higher yields were obtained from the closer plantings.

In 1927, Gradus x American Wonder (0-3584), spaced 1 inch produced 7½ pounds of ripe seed in a 33-foot row, while spaced at 2 inches the yield was 6 pounds, and at 3 inches 4¾ pounds. The complete data for 1928 are given in the following table:—

GARDEN PEAS—CULTURAL TEST IN 1928—DIFFERENT DISTANCES OF PLANTING

Variety, source, and distance of spacing	Date ready for table use	Date ripe and pulled	Length of vine	Length of pod	Number and size of peas	Yield per row
			in.	in.		lb.
English Wonder C.E.F. in 1928—						
1 inch	July 16	Aug. 23	14	2	4 large	1¾
2 inches	" 16	" 23	15	2¼	5 medium	1¾
3 "	" 16	" 23	13	2¼	5 large	1¼
American Wonder C.E.F. seed 1928—						
1 inch	July 14	Aug. 23	40	2	4 very large	2½
2 inches	" 14	" 23	40	2	5 medium	2¼
3 inches	" 14	" 23	44	2	5 medium	2
Gregory Surprise x English Wonder O-8627—						
1 inch	July 12	Aug. 25	36	2	5 medium	2½
2 inches	" 12	" 25	36	2	4 large	2
3 inches	" 12	" 25	40	2	4 large	2
Gradus x English Wonder O-6471—						
1 inch	July 14	Aug. 22	29	2½	4 large	2
2 inches	" 14	" 22	31	2	4 medium	1¾
3 inches	" 14	" 22	37	2	5 small	1¾

PEPPERS

In 1928, two varieties of peppers, Harris Earliest and Neopolitan, were sown under glass on April 24 and transplanted on June 4. There was a fair amount of green peppers, but no ripe ones were produced before the plants were killed by the frost on August 19.

In 1927, Harris Earliest gave a good yield which was harvested on September 6.

POTATOES—TEST OF VARIETIES

The land used for the potato test in 1927 was a heavy loam on which cereals had been grown the previous season. It was given a very liberal application of well rotted manure in the autumn of 1926, and ploughed to a depth of 6 inches. The land was then thoroughly cultivated to incorporate the manure in the soil. In the spring of 1927 it was again thoroughly cultivated and planting was done on May 9. Lack of moisture retarded growth and no potatoes were fit for table use until towards the end of August. The crop was light.

In 1928 six named varieties of potatoes and three unnamed varieties such as are grown by the farmers in this district were tested. All the plots received liberal applications of manure, were thoroughly cultivated, and in good tilth when the potatoes were planted on May 5 and 8. Where planting was done in rows, the rows were three feet apart, and the sets twelve inches apart, large sets being used. Where the potatoes were planted in hills, these were three feet apart each way with four medium size sets to a hill.

The following table contains the detailed results for the two years:—

POTATOES—RESULTS OF VARIETY TESTS

Varieties	Date ready for use		Total yield per acre		Marketable		Unmarketable.	
	1927	1928	1927	1928	1927	1928	1927	1928
			bush.	bush.	bush.	bush.	bush.	bush.
King Edward	Aug. 22	Aug. 2	192	264	122	200	70	64
Irish Cobbler	" 28	" 3	240	192	180	162	60	30
Carman No. 1	" 30	" 5	168	216	113	176	55	40
Gold Coin	" 25	" 2	216	225	141	190	75	35
Rochester Rose	" 20	July 23	192	288	132	238	60	50
Farmers' seed resembling Gold Coin	.....	" 26	.....	306	.....	246	.....	60
Farmers' seed resembling Carman No. 1	.....	" 28	.....	180	.....	160	.....	20
Farmers' seed resembling Early Ohio	.....	" 27	.....	240	.....	200	.....	40
Early Hebron, pure seed	.....	Aug. 1	.....	150	.....	125	.....	25
Rochester Rose, pure seed	.....	July 22	.....	384	.....	314	.....	70
Early Hebron	Aug. 12	.....	175	.....	140	.....	35	.....

COST OF GROWING A POTATO CROP

In 1927, a careful record was kept of all work in connection with a one-quarter-acre field of Rochester Rose potatoes, and the following costs were recorded. The prices of the seed and labour were higher that season than usual, but corresponded with the prices for this district.

Cost of hauling and spreading by hand 8 loads of manure, one man and team 7 hours at 50 cents per hour	$ 3 50
Ploughing and cultivating ¼ acre of land in fall of 1926, one man and team 6 hours at 50 cents per hour	3 00
Cost of 5 bushels of good medium sized potatoes for seed at $1.50 per bushel	7 50
Planting and covering by hand, two men 4 hours each at 40 cents per hour	3 20
Harrowing twice during the season, one man and team 2 hours each time, 4 hours at 50 cents per hour	2 00
Cultivating twice with horse cultivator, one man 3 hours at each operation 6 hours at 45 cents per hour	2 70
Hilling up of the potatoes, one man and one horse 3 hours at 45 cents per hour	1 35
Extra hilling with hand hoes, and weeding, two men 3 hours each at 40 cents per hour	2 40
Total cost of digging and storing, 5 men and 2 teams ploughing out, picking up, and storing 2 men and 2 teams 5 hours each at 50 cents per hour	5 00
3 men 5 hours each at 40 cents per hour	6 00
Total cost	$ 36 65

Actual yield from the ¼ acre plot, 52½ bushels.
Value of the 52½ bushels at harvest time at $1.25 per bushel and a ready market at that price for all available, $75.62.
Profit over cost of production, $38.97.
Cost to produce one bushel, 70½ cents.
Profit over cost on one bushel, 54½ cents.

POTATOES—SPROUTING SEED

Two varieties, Gold Coin and Rochester Rose, were used in this experiment which was conducted for the first time in 1928. Lots were planted with sprouted and unsprouted tubers on May 8. The potatoes from sprouted tubers were ready for use 8 to 10 days earlier than the unsprouted and the yields were considerably larger.

RADISH

Eight varieties were grown in 1927. Seeding was done on May 6 and 12, the earlier date giving slightly better results than the later. In 1928, seeding was done on May 15, June 12 and 20, and a supply of radishes was available throughout the season. The varieties recommended for the district are French Breakfast, Early Scarlet Globe, and Scarlet Turnip White Tipped.

RHUBARB

The following varieties and strains came through the winter of 1926-27 in good condition: Victoria, Ottawa Roots, Ruby Red Seedling (0-45), and St. Martin's. The earliest varieties were ready for use on May 28 and continued in use until the first picking on September 6.

In 1928, five large plants were obtained from seeding of Ruby, C.E.F., and Ruby No. 10-0-45, and very fair results were obtained from a few plants of Ruby from the 1927 seeding.

SALSIFY

The variety Mammoth Sandwich Island (Rennie) was tested in 1928. Growth throughout the season was good and a yield of 225 pounds was obtained on September 20 from three rows each thirty-three feet long.

SPINACH

On account of lack of moisture the quality of this vegetable was much below standard in 1927. King of Denmark gave the best results.

In 1928, two varieties, Victoria (McDonald) and Bloomsdale (McDonald) were sown on May 15 and were ready for use on June 24. The quality of both varieties was excellent.

SQUASH AND VEGETABLE MARROWS

A number of varieties of these vegetables tested in 1928 gave good results. Two varieties of marrow, English Vegetable Marrow and Long White Bush Marrow (Steele Briggs) were sown in a hotbed on April 26, and gave excellent results.

SWISS CHARD

Two varieties, Lucullus and Spinach Beet, were tested in 1927, and both made fair growth. The same two varieties were tested in 1928 and gave an abundance of leaves throughout the season.

SUMMER TURNIPS

Five varieties of summer turnips were tested in 1927, including two strains of Golden Ball, Red Top Strap Leaf, Extra Early Purple Top Melon and Snowball. All these varieties are suitable for this district.

The same varieties were tested in 1928 and gave good results.

TOMATOES

Fourteen varieties of tomatoes were tested in 1927. The seeds were sown in hotbeds on April 20, and between May 31 and June 3, the plants were transplanted to the open field in rows four feet apart each way. Owing to the dryness of the season only moderate success was obtained, and grasshoppers caused considerable damage. The following table contains the results for the year:—

TOMATOES—RESULTS OF TEST OF VARIETIES IN 1927

Variety and source	Ready for use	Yield of fruit	
		Ripe	Green
		lb.	lb.
Pruned to single stem—			
Danish Export (Wiboltt)	Aug. 20	8	27
AlacrityO-6-61 O-5405	" 22	6	26
John Baer Novelty (Morse)	" 24	4	22
I X L Extra Early (Rennie)	" 24	10	18
Early Detroit (Ferry)	" 26	3	16
Marglobe (Stokes)	" 26	2	18
Wayahead Novelty (Bruce)	" 27	6½	23
Tow stems—			
Prosperity (Patmore)	Sept. 1	4	31
Bonny Best (Stokes)	Aug. 29	7	35
Matchless Specialty (Burpee)	" 29	8	38
North Dakota Earliana (Wedge)	" 21	24	51
Bolgiano	" 20	20	64
San Jose Canner (Moore)	Sept. 3	12	52
Sparks Earliana (Burpee)	Aug. 30	15	66

In 1928 the tomato plants were tied to stakes, and stopped at the second truss of fruit, all laterals being removed. Weather conditions were unfavourable, and the frost of August 19 stopped all growth. The fruit was picked on August 20. None of the varieties had reached maturity and a small percentage of the fruit had been damaged by the frost. The results for the season are given in the following table.

TOMATOES—RESULTS OF TEST OF VARIETIES IN 1928

Varieties and source	Yield of green fruit	Size
	lb.	
Alacrity 4-5-1-1-1. O.6559	36	Medium.
Alacrity 10-4-2-2-1B. O-6559	40	"
Alacrity 4-9-2-1-1B. O-6560	54	Large, most advanced of any.
Alacrity x Hipper 5-2-1-7-1B	47	Large, changing colour.
Alacrity x Earlibell 1-4-2-9-1. O-6570	44	Medium.
Pink No. 1.1-3-1B. O-6574	20	Very large.
Pink No. 2. 2-3-1. O-6569	34	Very large and smooth.
Alacrity O-9720 Gen. Run	25	Large.
Alacrity x Hipper O-9725 Gen. Run	46	Medium, beginning to ripen.
Alacrity x Earlibell O-9729 Gen. Run	43	Large, fine and smooth.
Pink No. 1. O-9731 Gen. Run	41	Large.
Pink No. 2. O-9730 Gen. Run	31	Very large.
No. 2. A.B.B. 11390	34	Very large.
No. 3 L.G.B.B. 11390	26	Large.

Seed of two new strains, Viking and Fargo, was furnished by Mr. A. F. Yeager, Horticulturist of the North Dakota Agricultural College. These varieties were well advanced on August 20.

FLORICULTURE

Growth of flowers in hotbeds was excellent during the season of 1927 and transplanting was done on May 16. Seeding in the open garden was carried out from May 6 to 18. Good growth was made during the early part of the season, but the flowers suffered from the lack of moisture in July and August.

In 1928, in the flower garden, both annuals and perennials made a very fair showing, there being a continuous display of bloom from early May to the end of October.

ANNUAL FLOWERS

In 1927, the seed of a large number of annual flower varieties was sown under glass and the plants transplanted to the open garden between May 16

and 20. All bloomed profusely throughout the season. Varieties sown direct to the open ground were seeded between May 6 and 18.

Ninety-five varieties were tested in 1928. The hardiest were sown in the open from May 16 to 24, and the half-hardy varieties were started in hotbeds on April 24 and transplanted between June 11 and 16. Dates of blooming were later than usual owing to the dryness of the season. Nearly all varieties survived the severe frost of August 18.

SWEET PEAS

Three lots of sweet peas were tested in 1927, and growth was fair during the early part of the season, but lack of moisture retarded development later on. There was a fair amount of bloom which lasted until September 17, when it was destroyed by frost. The varieties used were Superb Mixed Spencers (McDonald), Picture, and Margaret Atlee. Cupid sweet peas were planted around the beds of the taller growing varieties of flowers as edging with very good effect.

In 1928, forty-seven varieties and strains of sweet peas were planted on May 18 and 20, in previously prepared trenches which were 10 inches deep with 4 inches of well-rotted manure packed fairly solidly in the bottom. The manure was covered with about 4 inches of top soil. The seeds were planted about 1 inch apart and were covered with about 2 inches of good soil, the remaining soil being placed along the trench on both sides so as to form a saucer-shaped trench which would hold water and prevent it running off, as the trenches were watered during dry weather.

The showing made by sweet peas in 1928 was much below the average. The dates of coming into bloom of the different strains varied between July 1 and 31.

PERENNIALS

Most of the different varieties of perennial flowers are now well established in the borders. Very fair growth was made during the early part of the 1927 season and some varieties began to bloom early in May. The following are the dates of coming into bloom of the different varieties in 1927:—

Varieties	Date in bloom
Pansies. One year old plants, many colours	May 28
Iceland Poppies. Mixed colours from white to red	" 26
Aquilegia, Columbine	June 16
Dianthus. Many strains and colours	" 28
A collection of 12 Large June Flowering Iris, Rennie	" 29
Paeonies. The older plants, white and red	July 9
Paeonies. New plants, a collection of 12, Rennie colours, bluish white, bright-rose pink, dark crimson	" 12
Delphinium, Larkspur. 1925 plants	" 11
Delphinium, Larkspur. 1926 plants	" 11
Rudbeckia, Cone Flower	" 25
Phlox. Many strains and colours	" 22
Dicentra, Bleeding Heart. New and old plants	" 4
Dictamnus Fraxinella, Gas Plant	" 15
Hesperis, Sweet Rocket	" 20
Gaillardia. Many colours	" 15
Lychnis, Jerusalem Cross	" 22
Achillea, The Pearl	" 19
Honesty, Lunaria Biennis	" 19
Cerastium, Snow in Summer, Rock plant	" 1
A collection of Rennie's, Summer Flowering Oxalis	June 2
" " Giant Summer Hyacinth	July 27
" " Montbretia	Aug. 12
A collection of Lilies, Tigrinum Plenum McDonald & Rennie	July 25
Cooperia Drummondii, The giant fairy lily	Aug. 20

In 1928, the first perennials came into bloom on May 14, and there was a continuation of bloom from different varieties up to August 19. A number of varieties of perennial seed were sown in a nursery bed on May 22 and 23, some of the varieties being new to the Station. This bed was given attention and was watered frequently. Very good growth was made with a number of varieties coming into bloom during the latter part of the summer.

ORNAMENTAL TREES AND SHRUBS

The very heavy pruning of many of the varieties of shrubs made necessary by severe winter killing resulted in late blooming in 1927. The different strains of *Rosa Rugosa* bloomed very profusely from June 28 to the end of August.

The following is an autumn 1927 comment on the collection of shrubs and roses received in the late autumn of 1926, and which were heeled in for the winter and transplanted to a permanent location in the spring of 1927:—

12 Acer ginnala	Doing well, good growth
12 Berberis Thunbergii	Eight alive, fair growth
2 Caragana pygmaea	Failed to grow
2 Celastrus orbiculatus	Failed to grow
2 Ribes alpinum	Fair growth
2 Cornus alba variegata	Failed to grow
2 Hydrangea arborescens grandiflora	Fair growth
2 Hydrangea pan. grandiflora	Very good growth
2 Ligustrum amurense	Good growth
2 Ligustrum regelianum	Good growth
2 Lonicera tartarica	Good growth
2 Lonicera Morrowi	Very good growth
2 Niobe Weeping Willow	Excellent growth
2 Salix laurifolia	Quite good growth
2 Sambucus canadensis maxima	Fine growth
2 Caragana frutescens	Very good growth
2 Spiraea oblongfolia	Good growth
2 Syringa japonica	Good growth
2 Syringa amurensis	Good growth
2 Syringa villosa	Good growth
2 Syringa josikaea	Good growth
2 Virburnum lantana	Fine growth
2 Thuya occidentalis	Failed to grow
2 Thuya wareana	Failed to grow
2 Spiraea Van Houttei	Good growth
2 Syringa rothomagensis	Fair growth
1 Maiden Hair Tree	Doing very medium
1 Kentucky Coffee Tree	Doing very poorly
These two may not survive the winter	
2 European Mountain Ash	Fair growth
2 Lombardy Poplar	Medium growth
2 Moss Rose	One failed to grow, the other did fairly well
2 Harrison Yellow Rose	Made but scant growth
2 Grootendorst Rose	Did very well
2 Cabbage Rose, Red	Failed to grow
2 Cabbage Rose, Pink	Failed to grow

The winter of 1927-28 was very notable for its extreme low temperature and lack of sufficient snow for root protection for the different plants. These severe winter conditions along with the very changeable weather during the spring caused a greater percentage of winter-killing than in any previous winter since this Station was established.

The severe winter-killing was more noticeable with all varieties of fruit trees, and bush fruits and roses, the two crab apple trees Ott-4001 that produced such a fine crop during the season of 1927 were completely killed and were removed.

Many of the very fine collection of roses supplied by the Horticultural Division, and of a large private collection, to which the very best of attention and protection had been given, were killed, and the few that did survive the severe winter showed very low vitality and easily succumbed to the extremely dry conditions of the past summer.

With the extremely dry summer, the flowering shrubs were slow in recovering from the effects of the severe winter which had caused much killing back of the tops, consequently the dates of coming in bloom were much later than usual, and the period they remained in bloom much shorter. They also lacked the vigour and beauty of more favourable seasons.

The different varieties of Rosa Rugosa did not come into bloom until June 23 and made only a very moderate showing this season.

In the following list are given the names of the varieties of shrubs set out in a new plantation during the spring of 1927, showing those that are still alive and making any headway. The seasonal weather conditions of the past two seasons have not been such that would promote strong, healthy growth. None of the young trees came into bloom during the past season.

	Variety	Remarks As to growth in 1928
12	Acer ginnala	Fair growth
4	Berberis Thunbergii	Medium growth
2	Caragana pygmaea	Winter-killed
2	Celastrus orbiculatus	Winter-killed
2	Cornus alba variegata	Winter-killed
2	Ribes alpinum	Fair growth
2	Hydrangea arborescens grandiflora	Good growth
2	Hydrangea pan grandiflora	Very good growth
2	Ligustrum amurense	Good growth
2	Ligustrum regelianum	Good growth
2	Lonicera tartarica	Very good growth
2	Lonicera Morrowi	Very good growth
2	Niobe Weeping Willow	Very fine growth
2	Salix laurifolia	Very good growth
2	Sambucus canadensis maxima	Very fine growth
2	Caragana frutescens	Strong growth
2	Spirea oblongifolia	Good growth
2	Syringa japonica	Good growth
2	Syringa amurensis	Good growth
2	Syringa villosa	Good growth
2	Syringa josikaea	Good growth
2	Viburnum lantana	Very fine growth
2	Thuya occidentalis	Winter-killed
2	Thuya wareana	Winter-killed
2	Spirea Van Houttei	Very good growth
2	Syringa rothomagensis	Only medium
1	Maiden Hair Tree	Winter-killed
1	Kentucky Coffee Tree	Winter-killed
2	European Mountain Ash	Medium growth
2	Lombardy Poplar	Just medium
2	Moss Roses	Winter-killed
2	Harrison Yellow Rose	Winter-killed
2	Grootendotst Rose	Winter-killed
2	Cabbage Rose Red	Winter-killed
2	Cabbage Rose Pink	Winter-killed

SMALL FRUITS

There was a great deal of winter killing of small fruits during the winter of 1926-27, on account of insufficient snow protection and low temperatures. This damage and the dry summer weather resulted in an almost complete failure of raspberries and strawberries.

In the exceptionally dry season of 1928, the results obtained from the different varieties of currants were much below the average, both in size and quality.

APPLES

Many of the young apple trees were completely winter-killed in 1927. The few trees that escaped with only partial winter killing made a fair growth and some produced a small percentage of bloom. However, except for two trees of Ott-4001, none of the varieties produced any fruit.

DATES OF FARM OPERATIONS FOR THE SEASON OF 1928 AT THE FORT VERMILION EXPERIMENTAL STATION AND DISTRICT

Operation	Date of Commencing
Hot-bed seeding	April 24
Spring ploughing	May 1
Harrowing and disking fall ploughed land	" 2
Wheat seeding general	" 4
Oat seeding general	" 8
Barley seeding general	" 10
Field pea seeding	" 9
Flax seeding	" 8
Fibre flax and hemp seeding	" 14
Spring rye seeding	" 8
Speltz or early emmer seeding	" 8
Buckwheat seeding	June 17
Field and garden beans seeding	May 18
All varieties of garden vegetables seeding	" 14
Potato planting	" 14
All varieties of field roots seeding	" 12
Field corn planting	" 11
Sunflower planting	" 12
Garden corn planting	" 13
Annual fodder crop, millet seeding	June 8
Annual fodder crop, kale and rape seeding	May 21
Annual fodder crop, field peas and oat mixtures	June 7
Grass, clover and alfalfa seeding	" 26
Transplanting vegetables from hotbeds	" 1
Transplanting flowers from hotbeds	" 18
Breaking new land	" 15
Summer-fallowing	" 20
Haying became general	July 23
Wheat harvesting general	Aug. 6
Oat harvesting general	July 30
Barley harvesting general	" 25
Spring rye and speltz harvesting general	Aug. 23
Harvesting all varieties of field roots	Sept. 13
" field corn	Aug. 27
" annual fodder crops, millets	" 23
" rape and kale	" 24
" oats and pea mixtures	" 24
" field corn	" 27
" potatoes	Sept. 12
" all garden vegetables	Sept. 6
Seeding of fall rye and winter wheat	Aug. 25
Grain threshing	" 29
Fall ploughing	Sept. 1

And continued until freeze up October 19.

The last spring frost occurred on May 10, and the first autumn frost occurred on August 18, leaving a frost-free period of 102 days.

The total precipitation from May 1 to August 31 was 4·70 inches, this limited amount of precipitation after a winter with a very scant snowfall has caused the land to become very dry.

CEREALS

The experimental work with grains in 1927 included tests of varieties of spring wheat, oats, barley, peas, speltz, flax, buckwheat and beans sown in plots one-sixtieth acre in size. The wheat was treated with sulphate of copper at the rate of one pound to eight bushels.

The germination of all cereal crops was greatly retarded and very irregular in 1928 on account of lack of moisture. The cereal plots were sown on land in excellent tilth where a manured root crop had been grown the previous year.

At harvest time the two outside rows of each plot were removed as was also one foot off each end in order to remove all abnormal plants. The results for the two years are given in the following table:—

SPRING WHEAT—RESULTS OF VARIETY TESTS

Varieties	Number of days maturing		Average length of straw including head		Strength of straw on scale of 10 points		Yield of grain per acre	
	1927	1928	1927	1928	1927	1928	1927	1928
			ins.	ins.			bush.	bush.
Reward, Ott. 928	100	.....	48	.....	8	.....	56	
Renfrew, 111	106	111	52	34	10	10	54	30
Red Bobs....., 222	102	.....	45	.....	10	.....	52	
Bishop, Ott. 8	102	101	47	33	10	10	52	30
Kubanka, Ott. 37	105	107	57	36	7	10	51	19
Kitchener	103	.....	48	.....	10	.....	50	
Marquis, Ott. 15	101	101	44	30	10	10	49	14
Red Fife, Ott. 17	105	.....	46	.....	10	.....	47	
Red Bobs	99	.....	43	.....	10	.....	45	
Huron, Ott. 3	103	96	44	27	10	10	43	20
Prelude, Ott. 135	93	85	41	30	10	10	42	20
Early Triumph	98	.....	44	.....	8	.....	41	
Garnet, Ott. 652	98	.....	47	.....	10	.....	40	
Kota	100	97	44	27	8	10	40	18
Ruby, Ott. 623	100	.....	44	.....	10	.....	39	
Club	103	97	51	30	9	10	37	21

Marquis wheat for the Influence of Environment experiment conducted for the Dominion Chemist yielded at the rate of 42 bushels per acre in 1927 and 39 bushels in 1928. It took 100 days to ripen in 1927 and 105 days in 1928.

The testing of additional varieties of wheat in rod-row plots began in 1927, and was continued in 1928. Varieties and strains that are especially promising are promoted to the larger test plots as time passes. By this method it is possible to obtain preliminary information concerning a considerable number of varieties more economically. The following varieties were tested in rod-row plots in 1928: Red Bobs 222; Early Triumph; Marquis Ott. 15; Garnet Ott. 652; Kitchener; Red Fife Ott. 17; Ruby Ott. 623; Reward Ott. 928.

OATS

In 1927, ten varieties of oats were sown in duplicate test plots of one-sixtieth of an acre each. The original plots were sown on land on which roots were grown the previous season, and the duplicate plots on land summer-fallowed the previous year. This gave an opportunity to study the varieties under conditions approximately similar to those found in large fields.

Six varieties were similarly tested in 1928, but gave yields greatly below average on account of the dry season.

The results for the two years are given in the following table, the yields for 1927 being those from the plots on root land.

OATS—RESULTS OF VARIETY TESTS

Varieties	Days to mature		Average length of straw		Strength of straw		Yield per acre			
	1927	1928	1927	1928	1927	1928	1927		1928	
			ins.	ins.			bush.	lb.	bush.	lb.
Banner, Ott. 49	95	.....	52	.....	10	.....	102	12		
Victory	95	.....	55	.....	10	.....	97	2		
Gold Rain	95	86	53	30	10	10	88	28	37	2
Leader	92	101	48	40	10	10	86	16	42	12
Columbian, Ott. 78	86	.....	37	.....	10	.....	78	28		
Eighty Day, Ott. 24	78	79	37	36	10	10	66	18	42	12
Alaska	81	.....	39	.....	10	.....	65	10		
Daubeney, Ott. 47	79	83	34	29	10	10	60	0	26	16
Liberty, Ott. 480	85	95	43	34	10	10	57	8	30	0
Laurel, Ott. 477	83	95	36	31	10	10	54	24	28	8

In 1928, for the first time, oats were included in the rod-row plot system, a start being made with eight varieties. The following varieties were tested in these plots: Abundance, Banner Ott. 49, Gerlack, Columbia Ott. 78, Victory, Legacy Ott. 687, Irish Victor and Alaska.

BARLEY

Thirteen varieties and strains of barley were tested in duplicate one-sixtieth of an acre plots in 1927. On account of lack of moisture the crops were not up to their usual standard and they were further reduced by the ravages of grasshoppers.

In 1928, the plots used, being on somewhat low ground, were not so much affected as the higher land, and the yield, while below average, was quite fair considering the seasonal conditions. With the exception of Hulless White, which was sown on May 8 at the rate of 2 bushels per acre, the varieties were all sown on May 9, at the rate of 2½ bushels per acre in rows seven inches apart.

The results for the two years are given in the following table.

BARLEY—RESULTS OF VARIETY TESTS

Varieties	Days to mature		Average length of straw		Strength of straw		Yield per acre			
	1927	1928	1927	1928	1927	1928	1927		1928	
			ins.	ins.			bush.	lb.	bush.	lb.
Duckbill, Ott. 57	91	.....	45	.....	5	.....	76	12		
O.A.C. No. 21	84	.....	36	.....	5	.....	62	24		
Manchurian, Ott. 50	83	91	42	30	8	10	61	12	37	24
Barks	91	104	36	34	10	10	57	24	36	12
Eureka	85	91	33	28	9	10	56	12	35	40
Chinese, Ott. 60	82	.....	35	.....	7	.....	55	0		
Gold (Sweden)	88	91	38	29	10	10	53	36	28	36
Albert, Ott. 54	82	92	35	45	9	10	52	24	46	12
Success	81	.....	34	.....	10	.....	51	12		
Alberta Beardless	90	98	44	36	4	10	50	0	26	12
Hulless White	85	98	33	36	10	10	47	24	32	24
Charlottetown 80	89	92	34	26	8	10	46	12	31	12
Black	82	98	32	41	10	7	38	36	33	36
Success	.....	91	.....	46	.....	10	.....		48	36

The following nine varieties of barley were grown in rod-row plots: Hannchen, Bearer Ott. 475, Gold, Canadian Thorpe, Velvet, O.A.C. 21, Star, Chinese Ott. 60, and Duckbill Ott. 57.

FIELD PEAS

In 1927, eight varieties of field peas were tested. They were sown on duplicate plots on May 10 and 11. Yields were slightly below average.

In 1928, the plots were sown on May 8 and 9. On account of lack of moisture, a large percentage of the seed did not germinate early enough to produce fully matured grain. The yields were low but the quality excellent.

FIELD PEAS—TESTS OF VARIETIES

Varieties	Days to mature		Average length of vines		Yield per acre		Weight per measured bushel after cleaning
	1927	1928	1927	1928	1927	1928	1928
			in.	in.	bush.	bush.	lb.
Dashaway	92	91	58	42	38	25	61·5
Mackay, Ott. 25	94	101	62	49	36	23	63·5
Chancellor, Ott. 26	93	82	52	34	34	18	61·0
Prussian Blue	94	101	56	38	32	14	63·0
Alberly Blue	94	90	52	44	28	22	63·0
Empire Blue	94	91	48	38	26	20	62·5
Arthur, Ott. 18	94	102	64	36	25	22	61·0

SPRING RYE

Two varieties were sown in duplicate plots in 1927 on summer-fallow land. Growth was quite fair and a good yield of very good quality was produced. The variety Select Ottawa yielded 49 bushels per acre and Common 48 bushels. The rye crops seem to withstand dry weather better than do other cereals.

In 1928, the original rye plots were sown on land similar to that used for other cereals, while the duplicate plots were sown on thoroughly summer-fallowed land. On the original plots Common Select Ottawa yielded 22 bushels per acre and on summer-fallow 54 bushels while Select Ottawa yielded 19 bushels on the original plots and 51 bushels on summer-fallow. This shows that summer-fallowing is advisable during dry periods.

A variety of speltz tested in 1928 gave the fair yield of 21 bushels per acre.

WINTER WHEAT

Two varieties of winter wheat, Kharkov M.C. 22 and O.A.C. No. 104, were sown on August 9, 1926. Both were completely winter killed.

FALL RYE

Five varieties of fall rye were sown in test plots on August 9, 1926, and on August 15, a large field plot of five acres was sown. With severe freezing of the ground during the late autumn, a light winter snowfall and alternate freezing and thawing in the spring, there was a large percentage of winter killing.

The five varieties were again tested in 1928, and, despite unfavourable conditions, the results were quite fair. The plots were sown on August 22, 1927, on land that had been under summer-fallow that season and manured at the rate of 15 wagon loads per acre in June. In the autumn, emergence was slow owing to the dryness of the soil and there was only a 75 per cent germination. The per cent stand of the different varieties on May 12, 1928, was North Dakota 50, Saskatoon 80, Mammoth White 45, Rosen 35, and Common 30.

Growth was good throughout the season and the plots were all cut on August 15 when the grain was fully matured. The results are given in the following table.

FALL RYE—RESULTS OF VARIETY TESTS, 1928

Name of variety	Date of ripening	Average length of straw including head	Strength of straw on scale of 10 points	Yield of grain per acre	Weight per measured bushel after cleaning
		ins.		lb.	lb.
North Dakota	Aug. 15	49	10	2,420	56·0
Saskatoon	" 15	50	10	2,520	57·0
Mammoth White	" 15	56	10	2,280	57·0
Rosen	" 15	52	10	2,040	55·5
Common, Vermilion Seed	" 15	56	10	2,160	56·5

The five-acre field plot gave a yield of 21 bushels 36 pounds per acre.

FLAX

Three varieties of flax were sown in duplicate one-sixtieth acre plots on May 17, 1927, but, owing to the land being low and moist at time of seeding, it hardened causing a low percentage of germination. It was necessary to reseed the plots which was completed on June 1. Germination from the second seeding was timely, growth good, and fair yields were obtained on August 25. The yields of the varieties were as follows: Fibre Flax 24 bushels 24 pounds, North Dakota No. 52 (wilt resistant) 22 bushels, and Premost 21 bushels 24 pounds.

The same varieties were tested in 1928. The results were as follows:—

FLAX—TEST OF VARIETIES, 1928

Variety	Days to mature	Average length of plants	Strength of straw	Yield of seed per acre	Weight per measured bushel after cleaning
		ins.		lb.	lb.
Premost No. 25	104	23	10	600	54·0
North Dakota, No. 52	97	25	10	720	55·5
Fibre Flax	97	27	10	520	54·5

BUCKWHEAT

Two varieties were tested in 1927 on land cropped to corn the previous season. Conditions favoured buckwheat fairly well and the crops were harvested on August 25. Silverhull yielded 33 bushels 36 pounds per acre and Japanese 28 bushels 36 pounds. Both matured in 96 days.

In 1928, these two varieties were sown on summer-fallowed land on June 7. Growth was good throughout the season and gave promise of a good yield when the severe frost of August 18 completely destroyed the crop.

FORAGE CROPS

FIELD ROOTS

In 1927, 36 lots of field roots were under test. The land had been in summer-fallow the previous year, and had received a good application of barnyard manure previous to ploughing.

SUGAR BEETS

Four varieties of sugar beets were tested in 1927 and six in 1928. The yields for the two seasons were:—

SUGAR BEETS—RESULTS OF TESTS OF VARIETIES

Varieties	Yield per acre	
	1927	1928
	tons lb.	tons lb.
Scheiber & Sons	15 1,920	11 1,440
Horning	18 960	13 640
Dippe	16 1,600	13 280
Home Grown	17 440	12 1,920
Frederiksen	....	11 1,400
Buszczynski	....	9 1,440

Sample roots were forwarded to the Dominion Chemist for determination of sugar content. The results of the analyses for 1927 were as follows:—

Laboratory number	Variety	Weight per root	Sugar in juice	Coefficient of purity
		lb. oz.	%	%
90970	Dippe	1 2	19·95	85·45
90971	Horning	1 0	20·25	86·54
90972	Scheiber & Sons	1 0	19·23	86·08
90973	Home Grown	0 7	19·54	86·00

MANGELS

In 1927, the mangel varieties were sown in the test plots in drills 24 inches apart and thinned to 10 inches apart in the row. In 1928 the drills were 20 inches apart and the plants thinned to 12 inches. The following were the yields obtained:—

MANGELS—RESULTS OF TESTS OF VARIETIES

Varieties	Yield per acre	
	1927	1928
	tons lb.	tons lb.
Yellow Intermediate (C.E.F..)	26 80	13 280
Danish Sludstrup (Ewing)	30 480	19 1,600
Yellow Intermediate (Invermere)	28 1,120	....
Giant Rose Sugar (McKenzie)	21 0	....
Eclipse (McKenzie)	26 440	21 120
Gate Post (McKenzie)	19 640	....
Golden Fleshed Tankard (Steele Briggs)	24 1,560	14 1,760
Giant Yellow Intermediate	23 1,040	22 280
Mammoth Long Red (Steele Briggs)	23 200	....
Leviathan Half Rose (Rennie)	....	20 1,400
Gaint Yellow Oval (Steele Briggs)	....	23 800
Giant Rose (McKenzie)	....	19 1,240
Giant Yellow Globe (Steele Briggs)	....	21 1,200
Red Tankard (Graham)	....	23 1,520

FIELD CARROTS

Six varieties of field carrots were tested in 1927 and eight varieties in 1928. In both years the plants were thinned to 4 inches apart in the rows.

Owing to poor germination the 1928 plots of Yellow Belgian and Long Orange Belgian were reseeded on June 19. The following table contains the yields for the two years.

FIELD CARROTS—RESULTS OF TESTS OF VARIETIES

Varieties	Yield per acre			
	1927		1928	
	tons	lb.	tons	lb.
Improved Intermediate (Ewing)	17	1,280	11	1,040
Yellow Belgian (Ewing)	13	1,720	13	440
Long Orange Belgian (McKenzie)	14	560	9	1,200
Improved Half Long White (McKenzie)	17	440	....	.....
White Belgian (Steele Briggs)	16	760	....	.....
Danish Champion (C.E.F.)	15	240	13	880
White Belgian (Ewing)	....	.....	12	1,920
Mammoth Short White (Ewing)	....	.....	14	320
Mammoth White Intermediate (Bruce)	....	.....	10	160
White Belgian (Dupuy & Ferguson)	....	.....	12	0

SWEDE TURNIPS

Seed in the plots was sown on May 18 in 1927 and on May 12 in 1928. The plants were thinned to 10 inches apart in the rows in 1927 and to 12 inches in 1928. The following table gives the results for the two years.

SWEDE TURNIPS—RESULTS OF VARIETY TESTS

Varieties	Yield per acre			
	1927		1928	
	tons	lb.	tons	lb.
Ditmars (McNutt)	18	120	....	.....
Bangholm (Nappan)	18	960	22	400
Westbury (Steele Briggs)	22	200	26	200
Bangholm (Kentville)	22	1,960	21	0
Jumbo (Steele Briggs)	21	1,200	27	0
Bangholm (Charlottetown)	24	840	27	1,080
Good Luck (Steele Briggs)	22	1,000	24	0
Bangholm (Charlottetown)	....	.....	27	1,800
Selected Purple Top (C.E.F.)	....	.....	21	600
Ditmars (McNutt)	....	.....	23	320
Hartley Bronze Top (Rennie)	....	.....	23	200
Canadian Gem (Steele Briggs)	....	.....	22	1,960
Skirvings Imp. Purple Top (McDonald)	....	.....	19	280

FALL TURNIPS

Eight varieties of fall turnips were tested in each of the two seasons. In 1928 this vegetable was sown on the lower part of summer-fallowed land which was comparatively moist and growth was good throughout the season. The data for the two years are contained in the following table.

FALL TURNIPS—RESULTS OF TESTS OF VARIETIES

Varieties	Yield per acre			
	1927		1928	
	tons	lb.	tons	lb.
Green Top Yellow Aberdeen (McKenzie)	17	200	....	.....
Purple Top Mammoth (Steele Briggs)	17	1,280	....	.....
Aberdeen Purple Top (Steele Briggs)	15	1,080	25	400
Red Paragon (Sutton)	18	1,800	26	500
White Globe (McKenzie)	16	760	....	.....
Hardy Green Round (Sutton)	14	560	20	800
Pomeranian White Globe (Steele Briggs)	10	1,000	....	.....
Early Six Weeks (Sutton)	21	840	21	1,200
Greystone (Steele Briggs)	....	.....	26	1,760
Pomeranian White Globe (Sutton	....	.....	27	600
White Globe (Ewing)	....	.....	28	400
Green Top Yellow Aberdeen (Ewing)	....	.....	16	1,600

ENSILAGE CROPS

FIELD CORN

In 1927 the test lots of field corn were on land that had been in oats the previous season and was manured at the rate of 15 loads per acre. Seed was sown in drills 3 feet apart and in hills 3 feet apart each way. The corn was frequently cultivated during the dry period to conserve soil moisture but the yields were low.

In 1928 the growth of corn was extremely slow, and many varieties had not come into tassel when the severe frost of August 18 occurred.

The yields for the two years are given in the following table.

FIELD CORN—RESULTS OF VARIETY TESTS

—	Yield per acre 1927				Yield per acre 1928			
	Hills		Drills		Hills		Drills	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Northwestern Dent (Brandon)	5	1,880	....	.....	4	1,000	4	100
Burr Leaming (Carter)	8	560	12	180	4	1,600	....	.....
Longfellow (Duke)	7	1,600	10	280	4	280	....	.....
Bailey (Duke)	9	0	8	1,640	....	.....	..	.....
Howe's Alberta x Wisconsin 7	8	0	11	980	....	.....	....	.....
Howe's Alberta	3	920	12	640	....	.....	.....	
White Cap Yellow Dent (Duke)	....	.....	....	.....	5	500	....	.....
Golden Glow (Duke)	....	.....	....	.....	5	20	6	600

A COMPARISON OF SOILS DURING THE PAST DRY SEASON IN RELATION TO CROP YIELDS

Within the experimental area the soil varies greatly in depth from one foot of dark loam with a gravelly subsoil on the higher portions to a depth of three feet of dark loam with a clay subsoil on the lower portions. The latter soil has a greater moisture retaining ability and can produce fair crops under conditions such as were experienced during the past season, as compared with the low yields from all crops this season on the higher lands.

Between the yields of field varieties of corn planted on the higher land, and that of the sweet or garden varieties planted on the heavier soil, there is a great contrast, yet these higher lands in this North Land are considered the best and safest in ordinary seasons with a moderate amount of precipitation,

from the standpoint of earlier seeding, more timely germination of seed, quicker growth and earlier maturity. In most seasons this would enable the crop to escape any early autumn frost which might not be the case with crops grown on the heavier soils.

SUNFLOWERS

Despite the dry weather the test plots of sunflowers made good growth in 1927 and fair yields of excellent fodder were obtained. The weights shown in the following table were taken 48 hours after the crops were cut.

SUNFLOWERS—RESULTS OF TESTS OF VARIETIES IN 1927

Variety	Distance between rows	Maturity when cut	Yield per acre	
			tons	lb.
Ottawa, 76	36	Ripe	20	800
Ottawa, 76	30	Ripe	20	1,700
Mennonite	36	50% bloom	21	300
Mennonite	30	50% "	21	1,566
Giant Russian	36	50% "	19	1,840
Giant Russian	30	55% "	21	1,560
Ottawa, 76	30	50% ripe	15	1,200
Ottawa, 76	24	50% "	15	300
Giant Russian	24	50% bloom	17	1,280

In 1928 germination of sunflower seed was timely but growth was slow and only a few varieties came into bloom. The feeding value was much impaired by severe frosts. It will be noticed in the following table that the earlier dates of seeding gave much the largest yields. This was because the early seeded corn had the advantage of the early moisture.

SUNFLOWERS—RESULTS OF TESTS OF VARIETIES, IN 1928

Variety and source	Date sown	Height of plant when cut	Per cent in bloom	Stage of maturity when cut	Yield of comparatively dry fodder per acre	
		ins.			tons	lb.
Mammoth Russian (Disco)	May 12	64	No bloom	Quite dry	28	1,600
Mennonite (Rosthern)	" 12	53	100	Kernels firm dough	22	640
Manchurian (McKenzie)	" 21	52	No bloom	Quite dry	15	900
Ottawa, 76	" 21	42	"	"	11	1,520
Mammoth Russian (McDonald)	" 21	39	"	"	9	240
Giant Russian (Disco)	" 21	53	"	"	14	500
Mennonite (Rosthern)	" 21	48	"	"	12	480
Mixed seed from 1927 crop	" 21	45	100	Kernels firm dough	5	800

FLESHY ANNUALS

Seven lots of rape and kale were sown in duplicate plots on May 21, 1927, on land that had been summer-fallowed in 1926. The crop from one set of plots was fed as needed and the other cut for record on August 24, giving the results shown in the following table.

In 1928 six varieties of kale and two of rape were sown at the rate of 2 pounds per acre. One-half of each plot was cut on August 18 and the remaining half on August 24. Any second growth was so scant on account of the frost of

August 18 as to be of no importance. The fodder was consumed with great relish by hogs, cattle, and sheep. The following are the results for the two years:—

FLESHY ANNUALS—RESULTS OF VARIETY TESTS

Varieties	Yield of green feed per acre			
	1927		1928	
	tons	lb.	tons	lb.
Purple Marrow Stem Kale	24	1,200	18	1,260
Improved 1000 Headed Kale	24	300	21	1,320
Green Marrow Stemed Kale	23	1,240	28	1,420
1000 Headed Kale	23	200	20	500
Dwarf Essex Rape	25	400	19	1,000
Improved Dwarf Essex Rape	23	1,110	—	—
Giant Rape	.....		22	1,000
Sheep Kale	.....		19	400
Marrow Stem Kale	.....		21	1,560

PERENNIAL AND BIENNIAL HAY CROPS

In 1923 a number of hay and pasture plots were sown, which up to 1926 gave excellent returns. The winter of 1925-26 left many of these plots unfit for further use, so that most of them were ploughed and put in shape for new seeding. Some alfalfa and a few grass plots on which the winter killing did not exceed 15 per cent were left and again cut for hay in 1927, giving low yields. However, when the very adverse seasonal conditions are taken into consideration it is clear that alfalfa particularly, and some of the grasses, will produce crops under the most unfavourable conditions.

The yields of alfalfa in 1926 were as follows: sown in drills 36 inches apart, 5 tons 1,910 pounds; in drills 30 inches apart, 6 tons 1,215 pounds; drills 24 inches apart, 5 tons 830 pounds; drills 6 inches apart, 5 tons 485 pounds; and sown broadcast, 4 tons 1,325 pounds.

To repeat previous tests new seedings of grasses, clovers, and some mixtures were made in 1926 on one-sixtieth-acre plots. Seed was drilled in, in drills 7 inches apart on land that had been summer-fallowed the previous year. No nurse crop was used. Excellent stands were obtained the year sown, but winter killing was severe, and the yields in 1927 were poor. All the plots were either partially or totally winter killed.

In the winter of 1927-28 winter killing was again very severe. Nineteen plots, mostly clovers, were completely killed. The results from the plots that survived are given in the following table:—

Variety	Distance apart of drills	Date harvested	Length of plants	Per cent stand season of 1928	Total yield per acre cured hay, 1928
	ins.		ins.		tons lb.
Alfalfa Grimms	Broadcast	July 6	22	100	1 1,660
" "	8	" 6	18	85	1 880
" "	12	" 6	20	100	2 800
" "	16	" 6	20	100	3 —
" "	20	" 6	21	90	2 1,040
" "	24	" 6	20	85	1 1,360
" "	28	" 6	19	85	1 1,600
" "	30	" 6	20	100	2 560
" "	32	" 6	18	100	2 80
Sweet Clovers:—					
White Blossom	8	" 9	40	100	4 400
White Blossom	Broadcast	" 9	51	100	3 240
Yellow Blossom	8	" 9	58	100	5 560
Yellow Blossom	Broadcast	" 9	60	100	5 80
½ acre, White Blossom	Broadcast	" 9	45	75	1 800
Timothy, Boon	Broadcast	" 11	23	100	3 240
Brome grass	8	" 11	47	100	5 1,280
Western rye grass	8	" 11	33	100	5 800
Alfalfa and Brome Grass Mixture sown broadcast 1-30 acre plot:—					
Brome grass		July 11	44	80	
Alfalfa		" 11	21	20	1 1,240

ANNUAL HAY CROPS

For a number of years annual hay crops have been under test at this Station. In 1927, in addition to those which had already been under test, some cereals were tested for hay production with excellent results.

MILLETS, SUDAN AND CANARY GRASS

Six millets were tested in 1927 on land that had been in summer-fallow the previous year and was in good moisture. Growth was excellent and good yields were obtained. Both Sudan grass and the millets tillered freely. Two plots of Canary grass were sown, one for seed and the other for hay. The seed plot was sown on May 23 and when cut on August 25 yielded at the rate of 540 pounds of seed per acre. A yield of 2 tons 1,040 pounds of green hay was obtained from the plot sown on June 1 and cut on August 2.

In 1928 the different varieties of millets were sown on May 18 and germination was very poor. A second seeding on summer-fallowed land was done on June 8 and a good stand obtained. The date of seeding, however, was too late to obtain good results. The yields for 1927 and 1928 are given in the following table:—

MILLETS—SUDAN GRASS AND CANARY GRASS—TEST OF VARIETIES

Varieties	Yield per acre in 1927, after wilting 48 hours		Yield of cured hay per acre 1928	
	tons	lb.	tons	lb.
Siberian Millet	12	960	3	900
Hungarian millet	15	1,200	3	0
Hog Millet	14	80	3	480
Japanese millet	12	300	2	1,400
Common millet	12	1,200	3	600
Early Fortune millet	8	160	2	1,580
Golden millet	....	.....	2	1,100
Kursh millet	....	.....	2	860
Sudan grass	10	280	2	800
Canary grass	....	.....	4	1,000

CEREALS FOR HAY

Some cereals for hay production were sown in one-sixtieth-acre plots on May 26-30. The land had been in sod the previous year. After ploughing, 15 tons of manure per acre was applied and thoroughly worked in by repeated disk harrowing in the fall of 1926. The land was in excellent shape for seeding and the plots yielded as shown in the table following:—

TEST OF CEREALS FOR HAY PRODUCTION, 1927

Variety	Rate of seeding	Yield cured hay per acre	
	bush.	tons	lb.
Banner oats White Alberta peas	2 1	3	808
Banner oats Arthur peas	1½ 1½	2	1,750
Banner oast Prussian Blue peas	1½ 1½	2	1,910
Banner oats Mackay peas	2 1½	3	85
Banner oats Empire peas	2 2	3	120
Banner oats	3	2	1,640
Victory	2½	2	1,000
Leader	2½	2	1,695
Gold Rain	3	2	1,550
Select O-12 Spring Rye	2½	2	80
Common Spring Rye	2½	2	175

TEST OF CEREALS FOR HAY PRODUCTION, 1928

Variety	Length of plants	Stage when cut	Yield per acre	
	in.		tons	lbs.
Victory oats	33	Soft dough	4	1,720
Victory oats and Empire Field Peas	32 24	Soft dough Peas just forming	4	1,840
Gold Rain Oats	35	Soft dough	4	1,900
Gold Rain Oats and Dashaway Field Peas	30 26	Soft dough Peas well formed	5	200
Banner oats	33	Advanced dough	6	960
Banner oats and Alberta White Field Peas	32 26	Advanced dough Peas well formed	5	1,760
Leader oats	42	Advanced dough	6	480
Leader oats and Chancellor Field Peas	40 29	Advanced dough Peas well formed	6	240
Common Spring Rye	44	Firm dough	4	1,120
Common Spring Rye and Arthur Field Peas	42 33	Firm dough Peas well formed	4	1,600
Mixed Field Peas	52	Well advanced	11	500

All varieties were a strong 100 per cent stand.

FIBRE PLANTS

Experimental work as to the suitability of this district for the growing of flax and hemp for fibre was again started this season.

One variety of flax and one of hemp were sown on May 14 in duplicate plots of one-sixtieth acre, on good dark loam soil that had been summer-fallowed the previous season, and was in a high state of fertility.

These crops were harvested on August 24 after some severe frost had been experienced. The total yield from a one-sixtieth acre plot of flax and a small sample of hemp were forwarded during the autumn to the Fibre Division, Ottawa, for retting and scutching, and to determine the actual value of the fibre produced in this Peace River district. The actual results, therefore, from a fibre standpoint, will not be known until the Fibre Division have completed their investigations.

The weights shown in the following table are for absolutely dry straw. The yields are considered low and may be attributed to the exceedingly dry season.

FLAX—VARIETY TEST, 1928

Variety	Yield from plot 1/60 acre	Total yield of dry straw per acre	
	lb.	tons	lb.
J. W. S.	83	2	980
Hemp	175	5	500

FORT SMITH, N.W.T.

The weather was cold until May 8, 1927. Then followed a period of changeable weather followed by dry weather which allowed seeding to be done during the last part of May. The drought lasted throughout June and up to July 20. Frosts in the first week of August injured the potato crop. Early in September there was a blizzard followed shortly by heavy frosts. The season closed with a good spell of mild weather which lasted until late in October.

In 1928, the winter lasted until late in April. The snow disappeared slowly leaving the soil nearly dry. There was a snowstorm on May 9, and heavy frosts from the 13th to the 16th. The first part of June was very hot and dry but there was a good shower on the 10th. On the 14th, a late frost destroyed tomato and potato plants. The second half of June was warm and dry but early July showers saved the situation to some extent. The usual August frosts did not occur on account of the pall of smoke from forest fires. There was a persistent drought until late fall which dried up the natural meadows and not enough hay was cut to winter the cattle on the St. Bruno farm. For this and other reasons, that farm has been given up. September and October were exceptionally fine.

HORTICULTURE

In 1927, vegetables, with the exception of tomatoes and cucumbers, did very well. Three varieties of cabbage sown in hotbeds, Selected Jersey Wakefield, Danish Ballhead and Copenhagen Market, were transplanted to two feet apart on June 15. Some were ready for use on August 15, and the whole crop was harvested in the last week of September, the three varieties giving about equal results. Extra Early Dwarf Erfurt cauliflower also did very well.

Four varieties of tomatoes were tested in 1927, including Earliana, Alacrity, Chalk's Early Jewel, and Bonny Best. The first named proved most satisfactory. The clusters of fruit were abundant and became quite large, but August frosts prevented ripening.

Three varieties of onions, Yellow Globe Danvers, Large Red Wethersfield, and Extra Early Wethersfield, were ready for use in the latter part of August. They were small but of excellent quality.

Big Boston and Crisp as Ice lettuce were ready for use on June 18, and radishes were ready on June 15. English Wonder peas yielded abundantly and were of excellent flavour. Beets did splendidly. The varieties tested were Extra Early Egyptian, Crosby Egyptian, and Detroit Dark Red Turnip.

Two varieties of potatoes were tested in 1927. A white variety from British Columbia gave poor results. Early Rose withstood the severe weather conditions much better. Pickaninny table corn was destroyed by frost in August.

In 1928, new experiments with inside and outside hotbeds were conducted. As in former years, on account of the climatic conditions, the seeds sown in hotbeds outside did much better than those sown in boxes inside.

Sprouting Early Rose potatoes was tried in 1928. The plants from sprouted seed gained rapidly and promised an early yield, but a frost on June 24 destroyed them to the ground. They grew again, however, and yielded as much as the other plants.

Drought favoured the development of injurious insects, particularly cabbage worms, which were combated by means of calcarsen sprayings.

CEREALS

The cereal crops did better than was expected in 1927, considering the dry season and heavy August frosts. Marquis wheat yielded at the rate of four bushels to one sown. One bushel, sown as an experiment on June 1, was a

total failure, the dry weather favouring the growth of weeds which checked out the wheat. A half bushel of Garnet wheat, sown on May 21, was a failure, probably on account of the poverty of the soil.

Twenty bushels of Banner oats were sown on manured land in 1927 and yielded 80 bushels of fairly good grain when harvested late in September. A peck of flax was sown on May 21, and looked promising until about the middle of July, but weeds and August frosts ruined the crop.

The winter wheat, sown in the fall of 1927, failed entirely. The spring wheat was sown late and was completely smothered by weeds.

ORNAMENTAL GARDENING

In 1927, the perennials bloomed from the end of June until late in October, in spite of severe frosts. Annuals started in hotbeds, including varieties of asters, antirrhinum, lobelias and phlox did not make a really good display until late in August. Lilacs were in full bloom on July 1, and greatly added to the appearance of the grounds. Caraganas were in full bloom by the end of June.

In 1928, the perennials succeeded fairly well. On May 28, fifteen sorb trees and 44 ornamentals received from Edmonton were planted. The plants had evidently been damaged in transportation and many died, but it is hoped to save a few.

FORT RESOLUTION, N.W.T.

In 1927, the warm weather did not set in until May 8, when the snow began to disappear from the fields. There was almost continuous dry weather throughout June, July, and August. Potatoes and other vegetables were injured by frost late in July. Ploughing was done on May 11, and vegetable seeds were sown on the 18th.

In 1928, thawing began about the end of April and continued until the middle of May, when there was a period of cold and snow which lasted several days. The gardens were ploughed and all vegetable seeds sown during the fine warm weather period from May 4 to 15. After the few cold days, May 20 to 25, planting and seeding were completed. There were a few showers in June, July, August, and September, but they were quickly absorbed by periods of hot weather.

GRAINS AND HAY CROPS

Thirty acres seeded in 1927, to a mixture of timothy, western rye grass, and red top yielded only three tons of short dry hay. Wheat, oats and barley were failures in 1927, due partly to drought and partly to the fact that the land is sod land. To remedy the latter condition the land is being ploughed deeply.

In 1928, the quantity of hay cut was insignificant. A small crop of green oats was grown.

VEGETABLES

Vegetables did fairly well in 1927. Three varieties of carrots, Chantenay, Guerande, and Early Shorthorn, gave excellent yields. Copenhagen Market cabbage also did well. Earliana and Bonny Best tomatoes produced an abundance of fruit which was picked while green to escape the frost. Red Wethersfield and Danvers Globe onions, and American Wonder peas were failures. Pickaninny and Golden Bantam corn gave poor crops, as did the varieties of beets sown. Swede turnips, radishes and Big Boston lettuce all gave excellent results.

In 1928, 58 bags of potatoes planted yielded only 148 bags. A small plot near the house gave the fair yield of 8 to 1.

Cabbages failed to head in 1928. The tomatoes were killed by a July frost. Extra Early Egyptian and Crosby Red beets produced good crops. Turnips failed, and the corn was destroyed by frosts. American Wonder peas succeeded very well. On the whole the vegetable garden was far from being a success in 1928. For several years weather conditions have been very unfavourable. However, when this abnormal period comes to an end, better results are expected from all crops.

ORNAMENTAL PLANTS AND SMALL FRUITS

In spite of the drought, wild fruits gave abundant yields throughout the district in 1927. Raspberries produced a crop never before equalled in the district.

Ornamental plants bloomed profusely in 1927. Asters, chrysanthemums, alyssum, godetia, California poppies, stocks, and antirrhinums all did very well. Good results were also obtained with these plants in 1928.

FORT PROVIDENCE, N.W.T.

The persistent drought during the growing season of 1927, caused the failure of most of the field crops. One hundred and ten bushels of potatoes were planted and yielded only 500 bushels. Garden crops fared somewhat better on account of artificial watering. Guerande and Chantenay carrots, Crosby Egyptian beets, Danish Ballhead, and Selected Jersey Wakefield cabbage and Swede turnips all gave fair yields considering the season.

In 1928, crops were generally poor on account of the drought. The spring rains were too late and plant growth was slow.

Thirty pounds of wheat sown in 1928, yielded only 125 pounds, half of the plot producing nothing. Potatoes were a failure, 150 bushels of seed yielding only 250 bushels. Thanks to steady watering the garden gave fair results. Carrots and Swede turnips gave good yields. After bearing fine leaves and flowers, the corn was completely frozen before producing ears.

There was an abundance of fine hay in the natural meadows and about 80 tons were cut.

Poultry is a good source of revenue at this substation. Feed consists principally of fish waste and of grain from Edmonton.

In 1928, barbed wire fences were being used for the first time. A new stable to replace the old one is being built.

SALMON ARM, B.C.

The spring of 1927 was exceptionally dry, cold and windy, with the result that practically all shallow planted garden seeds failed to germinate. Growth of all crops was exceedingly slow until well on into the summer months, when they were stimulated by frequent showers of rain, which also kept the pastures in good shape.

Oats were a fair crop, having been sown deep enough to germinate and grow. There was also a fair yield of hay but the quality was poor. The potato crop was light.

The practice of ploughing under green crops to provide much-needed humus and nitrogen to the orchard soils on the bench lands was continued in 1928, as also were the variety tests with tree fruits. Cereal and vegetable crops were only fair, the season being a very dry one.

BETSIAMITES, P.Q.

The weather in 1927 remained very cold until towards the end of May, and the continual heavy rains delayed work on the land, which is very level at this Substation. Some seeding was done at the end of May but the land was so cold that the results were unsatisfactory. The early June seedings did much better. More favourable weather was experienced from June 15 onwards, and all crops made rapid growth with the exception of those planted in May which had suffered from the cold.

In 1928 the season was again very late. It was impossible to do any seeding before June 16. In the fall of 1927 the soil had been covered with old manure and ploughed. It was again ploughed in the spring of 1928 and disked several times. The land at the Substation is low lying and very moist and retains the frost late in the spring and this, with the frequent cold northeast winds, delays growth considerably.

CEREALS

In 1927 wheat ripened early in September but the yield was light. An excellent crop of oats was harvested, Banner and Alaska doing particularly well. For some unknown reason barley was practically a failure. Two varieties of flax were grown, Longstem and Premost, and each gave a very heavy yield. The stems were strong and fibrous, and there was a good yield of seed. The pea and bean crops in 1927 were the best that have yet been produced at this Substation.

In 1928 the cereal crops succeeded fairly well. The varieties of grain used were Banner, Alaska, Gold Rain, and Liberty (hulless) oats, Albert, Ottawa 54, Himalayan, Ottawa 59, and Chinese, Ottawa 60, barley, Huron, Ottawa 3, and Garnet, Ottawa 652, wheat. No variety of corn succeeded. All the varieties germinated, but very slowly, and at the end of September the plants had barely reached a height of 1½ feet, with no sign of ears. Peas and beans were destroyed by frost before maturity.

FORAGE CROPS

The hay crop was heavier than usual in 1927 and was harvested in excellent condition. On July 1, 1928, the following varieties of grasses and legumes were sown: Orchard grass No. 1, Brome grass, Canada blue grass, Grimm alfalfa No. 1, Red Top No. 1, White Blossom sweet clover, common millet, White Dutch clover No. 1, Japanese millet, sainfoin, timothy No. 1, Kentucky blue grass, red clover (Canadian grown), alsike clover No. 1, and Golden millet. All these germinated fairly well, and were harvested in September.

VEGETABLES

In 1927, tomatoes, pumpkins, and cucumbers were a failure. The seedlings developed very satisfactorily in the hotbeds but were transplanted to the open ground too early and perished from the cold. Beets did not even germinate, probably due to excessive moisture. The early varieties of cabbage, such as Copenhagen Market and Early Jersey Wakefield, developed fine large heads, some of which were used in August. In spite of the attacks of slugs some very fine specimens of these two varieties were harvested. The varieties Danish Ballhead and Golden Acre received less attention from the slugs, and the heads were smaller but very solid and of excellent quality. Some very fine specimens of the Dwarf Erfurt and Snowball varieties of cauliflower were grown. There was an excellent crop of turnips of the varieties Top Strop Leaf, Purple Milan, Snowball and Golden Ball. Spinach, radishes, lettuce, parsnips, and carrots also did well.

In 1928 vegetables did not give as good results as in the previous year. Although cabbages had a very fine appearance early in the season and succeeded fairly well they were inferior to those of 1927. Caterpillars attacked them as well as other vegetables and gave much trouble. The cabbages were saved by numerous applications of liquid Aphine, but the turnips were practically all destroyed. Mangels failed to germinate in 1928. Several varieties of tomatoes were sown early in May, planted in hotbeds on June 4, and outside on June 25. A good crop was expected as the plants looked well, but they were destroyed by frost before they had time to ripen.

FLOWERS

There was a nice display of bloom in the flower garden in 1927. Stocks, poppies, and statice bloomed profusely and made a splendid showing. The gladioli were exceptionally fine. Asters languished somewhat after transplanting and had only begun to bloom when the frosts arrived.

FORT GOOD HOPE, N.W.T.

The Roman Catholic Mission at Fort Good Hope was founded in September, 1859, and established on the present site in 1862. The missionaries began, as soon as possible, to grow vegetables and grains, and in 1866 harvested 17 barrels of potatoes from 2½ barrels of seed, 3 barrels of barley, and 7 of kohl rabi.

Potatoes is the chief crop, and it has been grown on the same land, almost without fertilizer, for over 60 years. Since 1927 a little new land has been added to the potato patch, and 124 bags were harvested in 1928.

The weather was favourable during the growing season of 1928. In May the minimum temperature of 23 degrees occurred on the 15th. June and July were warm months, the temperature going as high as 88 degrees. Frost appeared in the middle of August, when peas and tomatoes were completely frozen.

Grand Rapids lettuce was successfully grown in 1928. Radishes succeeded only when sown under storm windows. When sown in the open the plants became tough and wormy. Copenhagen Market cabbage gave good heads of from 5 to 6 pounds. Quite a good crop of early dwarf peas was grown and gathered green. Chantenay carrots grew very well and fair results were obtained with Detroit Dark Red beets. Turnips succeeded very well, but kohl rabi was not a success. Tomatoes grew fairly well but were destroyed by frost on August 19 to 21.

Potatoes were put to sprout in the house early in May and planted on May 28. The crop was dug before the middle of September and was very good, half an acre producing 124 bags. The potato seed crop has not been changed for over 30 years. Onions do not succeed in this district.

At Fort Good Hope the greatest hindrance to cultivation is the lack of fertilizers and of draft animals for ploughing, no live stock being kept at the sub-station.

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