DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

LENNOXVILLE, QUE.

REPORT OF THE SUPERINTENDENT

J. A. McCLARY

FOR THE YEAR 1927

A heavy crop of mixed clover hay at the Dominion Experimental Station, Lennoxville, Que.

Printed by Authority of Hon. W. R. Motherwell, Minister of Agriculture
Ottawa, 1928

TABLE OF CONTENTS

DOMINION EXPERIMENTAL STATION, LENNOXVILLE, QUE.

REPORT OF THE SUPERINTENDENT, J. A. McCLARY

THE SEASON

The weather during the months of January, February and March was unusually mild with a moderate amount of snow. The ice went out of the St. Francis river on March 18, thirty-six days earlier than in 1926. The first seeding was done on April 19, twenty-six days earlier than the previous spring, but the cold, wet weather throughout May and June checked growth, especially of the corn crop. The weather was more favourable in July and the hay, grain and root crops made good growth. Haying was started later than usual but was an excellent crop. The fine warm weather in September enabled farmers to harvest late grain in good condition, and was very beneficial for corn, which was an average crop when harvested. October was fine; roots were harvested October 22, and fall ploughing was well finished by the end of the month. November was mild and very wet. The precipitation totalled 10·08 inches, being 6·20 inches in excess of any precipitation in November since the Station was established thirteen years ago. The total precipitation for December was 4·38 inches and the weather was very mild. The St. Francis river, which runs through the farm, was still open on the first of January.

METEOROLOGICAL RECORDS AT LENNOXVILLE, QUE., 1927

Month	Temperature, °F.						Precipitation				Sunshine	
	Mean		Maximum		Minimum		Rain	Snow	Total precipitation			
	1927	Average 13 years	Highest	Mean Maximum	Lowest	Mean Minimum			1927	Average 13 years	1927	Average 13 years
							inches	inches	inches	inches	hours	hours
January	15·32	11·05	41	24·93	−22	5·71	0·46	13·00	1·76	2·80	48·0	76·6
February	15·61	12·61	49	26·75	−33	4·47	.....	28·00	2·80	1·89	66·5	93·9
March	30·29	25·25	63	41·03	−10	19·55	2·05	2·50	2·30	2·52	158·1	146·3
April	40·18	39·70	83	52·83	14	27·53	1·48	1·06	1·59	2·50	236·9	162·7
May	49·13	50·71	75	59·39	23	38·87	4·36	0·20	4·38	2·35	123·9	196·9
June	57·95	59·70	88	70·70	31	45·20	3·77	.....	3·77	3·92	215·1	208·5
July	66·11	65·85	88	78·09	37	54·13	2·15	.....	2·15	3·91	187·1	230·6
August	61·85	63·35	82	74·55	38	49·16	4·05	.....	4·05	4·09	213·0	217·7
September	56·35	55·36	80	68·57	32	44·13	1·84	.....	1·84	3·98	165·6	160·1
October	48·35	44·95	81	58·61	24	38·09	4·00	.....	4·00	4·17	125·9	122·6
November	37·59	32·26	70	46·16	11	29·03	9·46	6·25	10·08	3·36	46·0	63·1
December	22·09	17·65	48	52·69	−14	13·55	2·42	19·50	4·38	2·74	44·2	52·9
Total or average	41·73	39·87	88	54·52	−33	30·78	36·05	70·51	43·10	38·23	1,630·3	1,731·9

ANIMAL HUSBANDRY

BEEF CATTLE

WINTER FEEDING OF BEEF CATTLE

Eighty-six steers were purchased locally in the fall of 1926 for experimental feeeding purposes as well as to consume the hay and ensilage produced on the farm, and to supply manure to keep up the fertility of the soil.

The steers were all two- and three-year-old grade Shorthorns, and averaged 912 pounds when tied in the barn on November 13. They were sold May 6, when they averaged 1,243 pounds, thus making a gain of 331 pounds, an average daily gain of 1·90 pounds.

The feeds used consisted of clover and timothy hay, oats, peas and vetch ensilage, sown in the proportion of 2 bushels of oats, 1 bushel of peas and ½ bushel of vetches, and standard recleaned elevator screenings, cottonseed, corn and oil cake meal. The amount of meal fed to each lot and the method of feeding is given for the different experiments.

The following table gives the price at which feeds were charged in all the beef cattle experiments:—

	Per ton
Corn meal	$37 00
Cottonseed	34 50
Screenings	34 00
Oil cake	53 00
Hay	8 00
Ensilage	3 00

UNIFORM VS. GRADUALLY INCREASED FEEDING OF MEAL TO FATTEN STEERS

Object of Experiment.—To ascertain which of the two methods of feeding meal to steers is the most practical and profitable.

Plan of Experiment.—Two uniform lots of six steers each were used for this experiment. They were tied in the barn November 13, and sold May 6. The feeds used for each lot consisted of 10 pounds of clover and timothy hay and 30 pounds of oats, peas and vetch ensilage per day per steer throughout the feeding period. The meal mixture fed to both lots consisted of 60 per cent of ground, standard recleaned elevator screenings and 40 per cent of cottonseed meal. Grain-feeding was started January 1 with both lots. Lot 1 received 5 pounds per head per day to May 6. Lot 11 was started on 3 pounds per head per day and increased 1 pound per day the first of each month to April 1, when they were eating 6 pounds per head per day and this amount was fed until May 6.

UNIFORM VS. GRADUALLY INCREASED FEEDING OF MEAL TO FATTEN STEERS

—		1927		Average for two years	
		Lot 1 Meal mixture, 5 pounds per day from January 1 to May 6	Lot 2 Meal mixture, 3 pounds per day January 1 and increased 1 pound the first of each month to May 6	Lot 1 Meal mixture, 5 pounds per day from January 1 to finish of experiment	Lot 2 Meal mixture, 3 pounds per day January 1 and increased 1 pound the first of each month to finish of experiment
Number of steers in each lot	No.	6	6	6	6
Total initial weight	lb.	6,290	5,352	5,935	5,716
Average initial weight	"	1,048·3	892	989·1	952·7
Total finished weight	"	8,470	7,435	7,856	7,554·5
Average finished weight	"	1,411·7	1,239·2	1,309·3	1,259·08
Number of days on test	days	174	174	187	1'7
Total gain per lot	lb.	2,180	2,083	1,921	1,838·5
Average gain per steer	"	363·3	347·2	320·1	306·4
Average daily gain per steer	"	2·09	1·99	1·71	1·64
Total meal consumed	"	3,780	3,456	3,990	3,768
Total hay consumed	"	10,440	10,440	11,250	11,250
Total ensilage consumed	"	31,320	31,320	33,750	33,750
Pounds of meal eaten per pound of gain	"	1·73	1·66	2·08	2·05
Pounds of hay eaten per pound gain	"	4·79	5·01	5·85	6·12
Pounds of ensilage eaten per pound gain	"	14·37	15·04	17·57	18·36
Total cost of feed	$	153·38	147·83	167·00	163·11
Cost of feed per head	$	25·56	24·64	27·83	27·18
Cost of feed per head per day	cts.	14·69	14·16	14·88	14·53
Cost of feed per pound gain	"	7·03	7·10	8·69	8·87

Deductions.—It will be noted from the table that Lot 1, fed 5 pounds of meal per day from January 1 to May 6, made a daily gain of ·10 of a pound more than lot 2, at a cost of ·07 of a cent less per pound of gain. This experiment has been conducted two years and the results of a two-year average show that slightly larger and cheaper gains were also made by the lot consuming a uniform amount of meal throughout the feeding period.

ELEVATOR SCREENINGS VS. COTTONSEED MEAL FOR STEER FEEDING

Object of Experiment.—To ascertain the relative value of standard recleaned elevator screenings compared with cottonseed meal, taking into account the gain and finish of beef steers.

Plan of Experiment.—Twelve steers were divided into two lots of six each for this experiment. Lot 1 was fed 10 pounds of clover and timothy hay and 30 pounds of oats, peas and vetch ensilage per day per steer during the feeding period. Commencing January 1, lot 1 was fed 3 pounds of clear screenings per head per day and this was increased 1 pound per day the first of each month until April 1, when they were eating 6 pounds per day and continued with this amount until May 6. Lot 2 was fed the same in every way excepting that they had clear cottonseed meal instead of screenings.

ELEVATOR SCREENINGS VS. COTTONSEED MEAL FOR STEER FEEDING

—		Lot 1	Lot 2
		Screenings	Cottonseed
Number of steers in each lot	No.	6	6
Total initial weight	lb.	5,634	5,570
Average initial weight	"	939	928·3
Total finished weight	"	7,575	7,490
Average finished weight	"	1,262·5	1,248·3
Number of days on test	days	174	174
Total gain per lot	lb.	1,941	1,920
Average gain per steer	"	323·5	320
Average daily gain per steer	"	1·86	1·84
Total screenings consumed	"	3,456	.....
Total cottonseed consumed	"	.....	3,456
Total hay consumed	"	10,440	10,440
Total ensilage consumed	"	31,320	31,320
Pounds of screenings eaten per pound of gain	"	1·78	.....
Pounds of cottonseed eaten per pound of gain	"	.....	1·80
Pounds of hay eaten per pound of gain	"	5·38	5·44
Pounds of ensilage eaten per pound of gain	"	16·14	16·31
Total cost of feed	$	147 49	148 36
Cost of feed per head	$	24 58	24 73
Cost of feed per head per day	cts.	14 13	14 21
Cost of feed per pound of gain	"	7·60	7 73

Deductions.—There was very little difference in the finished quality or cost per pound of gain of the two lots, as the lot fed screenings cost 7·60 cents per pound of gain, and the lot receiving cottonseed 7·73 cents per pound of gain. This experiment was tried out when cottonseed was very cheap in the autumn of 1926, costing only 50 cents per ton more than screenings.

STANDARD ELEVATOR SCREENINGS VS. MEAL MIXTURE

Object of Experiment.—To ascertain the value of ground standard recleaned elevator screenings compared with a meal mixture as a feed for fattening steers, taking into consideration the gain, cost of feed per pound of gain and the quality of finish.

Plan of Experiment.—Sixteen steers were divided into two equal lots and were fed 10 pounds of hay and 30 pounds of oats, peas, and vetch ensilage each per day. Each lot was fed the same number of pounds of meal for the period. Lot 1 was fed clear ground elevator screenings and lot 2 a meal mixture consisting of 60 per cent of screenings and 40 per cent ground corn. Grain-feeding was commenced January 1, when they were fed 3 pounds of meal per steer per day and this was increased 1 pound per day the first of each month until April 1, when they were eating 6 pounds each per day, which was continued until they were sold May 6.

STANDARD ELEVATOR SCREENINGS VS. MEAL MIXTURE

—		1927		Average for six years	
		Lot 1 Screenings	Lot 2 Meal mixture	Lot 1 Screenings	Lot 2 Meal mixture
Number of steers in each lot	No.	8	8	8	8
Total initial weight	lb.	7,512	7,234·4	7,808	7,919
Average initial weight	"	939	904·3	976	989·9
Total finished weight	"	10,100	9,792·8	9,764	9,869
Average finished weight	"	1,262·5	1,224·1	1,220·5	1,233·7
Number of days on test	days	174	174	187	187
Total gain per lot	lb.	2,588	2,558·4	1,956	1,950
Average gain per steer	"	323·5	319·8	244·5	243·7
Average daily gain per steer	"	1·86	1·84	1·31	1·30
Total meal consumed	"	4,608	4,608	6,008	6,008
Total hay consumed	"	13,920	13,920	14,967	14,967
Total ensilage consumed	"	41,760	41,760	42,736	42,736
Pounds of meal eaten per pound of gain	"	1·78	1·80	3·07	3·08
Pounds of hay eaten per pound of gain	"	5·38	5·44	7·65	7·67
Pounds of ensilage eaten per pound of gain	"	16·14	16·32	21·85	21·91
Total cost of feed	$	196 66	199 44	215 37	234 73
Cost of feed per head	$	24 58	24 93	26 92	29 34
Cost of feed per head per day	cts.	14·13	14·32	14·39	15·69
Cost of feed per pound of gain	"	7·60	7 79	11·01	12·04

Deductions.—Lot 1, which was fed screenings, made an average daily gain of 1·86 pounds at a cost of 7·60 cents per pound of gain. Lot 2, fed a meal mixture, averaged 1·84 pounds of gain per steer per day at a cost of 7·79 cents. In the six-year average there is a difference of over one cent per pound in favour of screenings. The reason for this is that six years ago, when this experiment was started, corn was worth $10 per ton more than screenings. At the present time the price of these two feeds is about equal, which does not justify the use of screenings alone as a feed for steers, but it makes a good combination with corn and oil cake.

STANDARD ELEVATOR SCREENINGS VS. DIFFERENT MEAL MIXTURES

Object of Experiment.—To ascertain the value of standard recleaned elevator screenings compared with different meal mixtures as a feed for fattening steers, taking into consideration the cost of feed per pound of gain and quality of finish.

Plan of Experiment.—Twenty-four steers were divided into four lots as uniform in size, weight and conformation as possible. They were fed 10 pounds of mixed clover and timothy hay each per day from the time they were tied in the barn, November 13, until they were sold on May 6, making 174 days on test. They also consumed 30 pounds of oats, peas, and vetch ensilage each per day for the same period. Commencing January 1, they were fed 3 pounds of meal per steer per day and this was increased 1 pound per day the first of each month until April 1, when they were eating 6 pounds each per day, which was continued until May 6, when they were sold. The following table gives

the different meal mixtures and the percentage of each kind of meal consumed. The steers in each of the four lots ate the same number of pounds of the mixture during the feeding period.

STANDARD ELEVATOR SCREENINGS VS. DIFFERENT MEAL MIXTURES

—		Lot 1	Lot 2	Lot 3	Lot 4
		Screenings	Screenings, 60 per cent; Corn, 40 per cent	Screenings, 60 per cent; Cottonseed, 40 per cent	Screenings, 60 per cent; Oil cake, 40 per cent
Number of steers in each lot	No.	6	6	6	6
Total initial weight	lb.	5,634	5,426	5,352	5,520
Average initial weight	"	939	904·3	892	920
Total finished weight	"	7,575	7,345	7,435	7,730
Average finished weight	"	1,262·5	1,224·1	1,239·2	1,288·3
Number of days on test	days	174	174	174	174
Total gain per lot	lb.	1,941	1,919	2,083	2,210
Average gain per steer	"	323·5	319·8	347·2	368·3
Average daily gain per steer	"	1·86	1·84	1·99	2·12
Total screenings consumed	"	3,456	.....	.....	.....
Total meal mixture consumed	"	.....	3,456	3,456	3,456
Total hay consumed	"	10,440	10,440	10,440	10,440
Total ensilage consumed	"	31,320	31,320	31,320	31,320
Pounds of screenings eaten per pound of gain	"	1·78	.....	.....	.....
Pounds of meal mixture eaten per pound of gain	"	.....	1·80	1·66	1·56
Pounds of hay eaten per pound of gain	"	5·38	5·44	5·01	4·72
Pounds of ensilage eaten per pound of gain	"	16·14	16·32	15·04	14·17
Total cost of feed	$	147 49	149 56	147 83	160 61
Cost of feed per head	$	24 58	24 93	24 64	26 77
Cost of feed per head per day	cts.	14·13	14·32	14·16	15·38
Cost of feed per pound of gain	"	7·60	7·79	7·10	7·27

Deductions.—As will be observed from the table, Lot 1, fed clear screenings, was used for comparison, and screenings were also used as a base for the other mixtures which contained 60 per cent of screenings and 40 per cent of the other feeds. Lot 1 made an average daily gain of 1·86 pounds at a cost of 7·60 cents per pound of gain. As screenings cost nearly as much as cottonseed this year, it brought the cost per pound of gain a little higher than some of the other mixtures. Lot 2, fed screenings and corn, made the lowest gains of the four lots, and at the highest price per pound of gain. Lot 3, fed screenings and cottonseed, made better gains than either lots 1 or 2 at the least cost of the four lots per pound of gain. The average gain was 1·99 pounds per day, which cost 7·10 cents per pound. Lot 4, which had screenings and oil cake, gained an average of 2·12 pounds per steer per day, making the highest gain of the four lots, but the cost was a little above that of lot 3, on account of the higher price of oil cake. When the finish of the steers in lot 4 is taken into consideration, which is estimated at one-half cent per pound in value above the other lots, the results will show that a mixture of screenings and oil cake makes one of the most satisfactory meal mixtures for steer feeding.

WINTER FEEDING OF STEERS IN PENS VS. TIED

Object of Experiment.—To determine the relative merits of the two methods of housing steers for winter feeding, namely, loose in a large pen or tied in the stable.

Plan of Experiment.—Two uniform lots of ten steers each were compared. Both lots were put into the barn November 13, and fed 10 pounds of clover and timothy hay and 30 pounds of oats, peas and vetch ensilage per steer per day until May 6, when they were marketed. Commencing January 1, both lots received an average per steer of 3 pounds of meal per day, which was increased 1 pound per day the first of each month until April 1, when they were eating

6 pounds per day, and this amount was fed until May 6. The meal mixture consisted of 60 per cent of screenings and 40 per cent of cottonseed meal.

WINTER FEEDING OF STEERS IN PENS VS. TIED

—		1927		Average for nine years	
		Lot 1 Loose	Lot 2 Tied	Lot 1 Loose	Lot 2 Tied
Number of steers in each lot	No.	10	10	10	10
Total initial weight	lb.	8,180	8,920	8,552	9,590
Average initial weight	"	818	892	855·2	959
Total finished weight	"	11,225	12,392	11,100·6	12,057
Average finished weight	"	1,122·5	1,239·2	1,110·0	1,205·7
Number of days on test	days	174	174	185	185
Total gain per lot	lb.	3,045	3,472	2,548·6	2,467
Average gain per steer	"	304·5	347·2	254·8	246·7
Average daily gain per steer	"	1·75	1·99	1·38	1·33
Total meal consumed	"	5,760	5,760	7,489	7,489
Total hay consumed	"	17,400	17,400	18,467	18,467
Total ensilage consumed	"	52,200	52,200	55,400	55,400
Pounds of meal eaten per pound of gain	"	1·89	1·66	2·94	3·03
Pounds of hay eaten per pound of gain	"	5·71	5·01	7·24	7·48
Pounds of ensilage eaten per pound of gain	"	17·14	15·03	21·74	22·46
Total cost of feed	$	246 40	246 40	301 55	301 55
Cost of feed per head	$	24 64	24 64	30 15	30 15
Cost of feed per head per day	cts.	14·16	14·16	16·30	16·30
Cost of feed per pound of gain	"	8·09	7·10	11·83	12·22

Deductions.—From the foregoing table it will be noticed that lot 1, which was run loose in a pen, gained 1·75 pounds per steer per day at a cost of 8·09 cents per pound of gain. Lot 2, tied, gained 1·99 pounds per steer per day at a cost of 7·10 cents per pound of gain, which makes a difference of practically one cent per pound in favour of lot 2. This is the second time in nine years that the steers which were tied made the largest and cheapest gains. This experiment has been conducted for nine years and seven years out of this period the steers run loose in a pen made the largest gains, and the average cost per pound gain for the lot which was tied was 12·22 cents. This shows quite conclusively that it is more economical to feed steers loose in pens.

DUAL-PURPOSE SHORTHORNS

The Shorthorn herd numbered 28 head on December 31, 1927, consisting of the herd bull, 5 male and 5 female calves born during the year, 6 heifers and 11 cows. The herd sire "Kentville Major 2nd"—172627— was bred at the Kentville Experimental Station, Kentville, N.S., and comes from ancestors with good milk-records. There are seven heifers milking at present, which were sired by the old herd bull "Weldwood Lassie's Lad" —135100— who had excellent milk-records behind him. It is expected these heifers will develop into good general-purpose Shorthorn cows.

The average milk production of the Shorthorn herd, pounds of butter-fat, feed cost to produce one hundred pounds of milk and cost of feed for seven cows which finished a lactation period during the year, will be found in the individual milk-record table at the end of the dairy cattle section of the animal husbandry report.

FEED COST OF MAINTAINING A SHORTHORN HERD BULL FOR ONE YEAR

The following table gives the amount of feed consumed and cost of feed for a Shorthorn two-year-old herd bull for one year:—

FEED COST OF MAINTAINING A SHORTHORN HERD BULL FOR ONE YEAR

1,475 pounds meal at $1.50 per cwt	$ 22 12
5,840 pounds ensilage at $3 per ton	8 76
1,120 pounds roots at $3 per ton	1 68
2,940 pounds hay at $8 per ton	11 76
Total cost of feed	44 32

DAIRY CATTLE

The breeding of Ayrshire and Jersey cattle is one of the main features of the live stock work at this Station. The work carried on with dairy cattle consists of cost of production of milk and butter-fat, cost of raising calves on different meal mixtures, cost of raising heifers to breeding age and experimental breeding work. The herd has been fully accredited since 1922.

Thre has been an increase of nine head in the two dairy herds during the year, and eleven male calves were sold to farmers for breeding purposes.

All young bulls that are eligible are entered for Advanced Registry when old enough. The Advanced Registry is a great benefit to live stock breeders in assisting them in selecting their sires, and it raises the standard of the bulls in the breeds in which this system has been adopted.

AYRSHIRES

The Ayrshire herd totalled 49 head December 31, 1927, as follows: 24 cows, 7 heifers, 12 heifer calves, 1 herd sire and 5 young bulls. The bull used at the head of the herd is "Ottawa Supreme 10th"—91809— Advanced Registry No. 21, Class AA. His sire was the imported bull "Shewalton Mains Supreme" (imp.)—83930—(22659) Advanced Registry No. 16, Class AA, one of the best breeding bulls ever owned at the Central Experimental Farm, Ottawa. His dam was "Auchenbay Mina 5th" (Imp.) —62785—, considered one of the best illustrations of a combination of type and production. The calves from this bull, of which a good percentage are heifers, look very promising and should make a valuable acquisition to the herd later on. Twenty-two calves were raised during the year, twelve females and ten males.

The average milk-production of the Ayrshire herd, pounds of butter-fat, feed cost to produce 100 pounds of milk and cost of feed of fifteen cows which finished a lactation period in 1927, are to be found in the individual milk-record table at the end of the dairy cattle section of the animal husbandry report.

FEED COST OF RAISING AYRSHIRE CALVES FROM BIRTH TO ONE YEAR

The cost of raising calves was calculated from the average cost of raising four calves. They were fed whole milk for eight weeks, when they were gradually changed to skim-milk. As soon as the calves learn to eat they are fed a little dry meal and some good clover hay, and a small amount of ensilage and roots, if available, after they are six months of age. The following table gives the amount of each kind of feed consumed during the year:—

AVERAGE FEED COST OF RAISING AYRSHIRE CALVES FROM BIRTH TO ONE YEAR

—		Amount of feed	Cost of feed
			$ cts.
Whole milk at $1.50 per cwt.	lb.	600	9 00
Skim-milk at $0.25 per cwt.	"	2,520	6 30
Meal at $1.50 per cwt.	"	457	6 85
Ensilage at $3 per ton	"	1,657	2 48
Roots at $3 per ton	"	1,310	1 96
Hay at $8 per ton	"	975	3 90
Pasture at $1.50 per month	month	1	1 50
Total cost of feed			31 99

FEED COST OF RAISING DAIRY HEIFERS FROM BIRTH TO TWENTY-SIX MONTHS OF AGE

The cost of raising dairy heifers from birth to breeding age, twenty-six months, was figured on six Ayrshire heifers which were born from December 12, 1924, to January 13, 1925.

AVERAGE FEED COST OF RAISING DAIRY HEIFERS FROM BIRTH TO TWENTY-SIX MONTHS OF AGE

—		Amount of feed	Cost of feed
			$ cts.
Whole milk at $1.50 per cwt	lb.	600	9 00
Skim-milk at $0.25 per cwt	"	2,520	6 30
Meal at $1.50 per cwt	"	950	14 25
Ensilage at $3 per ton	"	7,864	11 80
Roots at $3 per ton	"	3,382	5 07
Hay at $8 per ton	"	3,116	12 46
Pasture at $1.50 per month	month	7	10 50
Total cost of feed			69 38

FEED COST OF MAINTAINING AN AYRSHIRE HERD BULL FOR ONE YEAR

The following table gives the amount of feed consumed by an Ayrshire bull in one year and the cost of feed:—

FEED COST OF MAINTAINING AN AYRSHIRE HERD BULL FOR ONE YEAR

1,675 pounds meal at $1.50 per cwt	$ 25 13
5,260 pounds ensilage at $3 per ton	7 89
610 pounds roots at $3 per ton	0 91
3,650 pounds hay at $8 per ton	14 60
Total cost of feed	48 53

JERSEYS

At the close of the year there were on hand 22 head of Jerseys made up as follows: 1 herd sire, 1 bull calf, 10 cows, 7 heifers and 3 heifer calves. The herd sire is "Ottawa Gamboge 5th"—32116—Advanced Registry, Class A, whose sire was the imported "Castlehill Sybil's Gamboge"—12271. "Social Sybil," a half-sister, was seventeen times a grand champion cow. His dam was "Brampton Erica's Pride" (imp.)—22428—a very typey individual with good udder, teats and excellent breeding record.

The average milk production of the Jersey herd, pounds of butter-fat, feed cost to produce 100 pounds of milk and cost of feed of eight cows which finished a lactation period in 1927 are to be found in the individual milk-record table at the end of the dairy cattle section of the animal husbandry report.

FEED COST OF RAISING JERSEY CALVES FROM BIRTH TO ONE YEAR

The cost of raising calves from birth to one year was figured from the average amount and cost of feed for three calves during that period.

AVERAGE FEED COSTS OF RAISING JERSEY CALVES FROM BIRTH TO ONE YEAR

		Amount of feed	Cost of feed
			$ cts.
Whole milk at $1.50 per cwt	lb.	600	9 00
Skim-milk at $0.25 per cwt	"	2,520	6 30
Meal at $1.50 per cwt	"	487	7 30
Ensilage at $3 per ton	"	1,391	2 09
Roots at $3 per ton	"	811	1 22
Hay at $8 per ton	"	871	3 48
Pasture at $1.50 per month	month	1	1 50
Total cost of feed			30 89

CALF-FEEDING EXPERIMENT

Objects of Experiment.—1. To test out the value of a home-mixed calf meal versus a commercially mixed product to be fed as a substitute for whole milk.

2. To ascertain which is the most practical and profitable system of feeding calves, twice or three times daily.

Plan of Experiment.—Twelve calves were used for this experiment, and were divided into four lots of three calves each. They were fed whole milk for eight weeks, commencing with 8 pounds per day, which was gradually increased until they were receiving 12 pounds per day at sixty days, when they were gradually weaned from whole milk to skim-milk. Two lots were fed a meal mixture composed of 3 parts of finely ground oats, 2 parts of ground corn and 1 part of ground flaxseed. Two lots were fed a commercial calf meal called Royal Purple. These meals were made into a porridge by using boiling water and stirring the dry meal into it until it became a jelly. This was added to the skim-milk at feeding time as a substitute for the butter-fat that was lacking in the skim-milk. The experiment was conducted for three months. Lot 1 was fed 1 pound of home-mixed meal and lot 2, 1 pound of Royal Purple meal per day in conjunction with 14 pounds of skim-milk and 3 pounds of hay fed in two feeds per day. Lot 3, was fed exactly the same amount of feed as lot 1, and lot 4 the same as lot 2, the only difference being that this feed was fed three times per day instead of twice. The following table gives the cost to produce one pound of gain with the different substitutes and method of feeding.

CALF-FEEDING EXPERIMENT

—		Lot 1	Lot II	Lot III	Lot IV
		Home mixture fed twice per day	Royal Purple fed twice per day	Home mixture fed three times per day	Royal Purple fed three times per day
Number of calves in experiment	No.	3	3	3	3
Length of feeding period	days	90	90	90	90
Total initial weight	lb.	356	340	396	383
Average initial weight	"	118·7	113·3	132	127·7
Total finished weight	"	850	770	780	785
Average finished weight	"	283·3	256·7	260	261·7
Total gain per group	"	494	430	384	402
Average gain per calf	"	164·7	143·3	128	134
Average daily gain per calf	"	1·83	1·59	1·42	1·49
Amount of skim-milk fed per group	"	3,780	3,780	3,780	3,780
Amount of skim-milk fed per calf	"	1,260	1,260	1,260	1,260
Amount of meal fed per group	"	270	270	270	270
Amount of meal per calf	"	90	90	90	90
Amount of hay fed per group	"	810	810	810	810
Amount of hay fed per calf	"	270	270	270	270
Cost of feed per group, milk-substitute neglected	$	12·69	12·69	12·69	12·69
Cost of milk-substitute per group	$	6·07	11·88	6·07	11·88
Total cost of feed per group	$	18·76	24·57	18·76	24·57
Cost of feed per calf	$	6·25	8·19	6·25	8·19
Cost of feed milk-substitute neglected, per pound gain	cts.	2·57	2·95	3·30	3·16
Cost of milk-substitute per pound gain	"	0·12	0·28	0·15	0·29
Cost of feed per pound gain	"	3·80	5·71	4·88	6·11

VALUATION OF FEEDS

Royal Purple	$ 4 40 per cwt.
Meal mixture	2 25 "
Skim-milk	0 25 "
Hay	8 00 per ton

Deductions.—1. The table shows that the best and most economical gains were made with lot 1, which was fed the home mixture.

2. The best gains were made on twice a day feeding, both with home-mixed and Royal Purple meal.

INDIVIDUAL MILK RECORDS COMPLETED DURING THE YEAR 1927

Ayrshire

Name of Cow	Age at beginning of lactation period	Date of dropping calf	Number of days in the lactation period	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds of butter fat produced in period	Pounds of butter produced in period	Value of butter at 40 cts. per pound	Value of skim-milk and butter-milk at 25 cts. per cwt.	Total value of product	Amount of meal eaten at $1.50 per cwt.	Amount of roots, ensilage and green feed at $3.00 per ton	Amount of hay eaten at $8.00 per ton	Months pasture at $1.50 per month	Total cost of feed	Cost to produce 100 lb. milk	Cost to produce 1 lb. butter skim-milk neglected	Profit on 1 lb. of butter, skim-milk neglected	Profit over cost of feed per cow
	y. m.															$	$	$	$	$
Lennoxville Pansy	5– 6	Feb. 14–26	564	13,451·2	23·85	3·85	519·01	610·60	244·24	32·10	276·34	3,389	17,341	3,738	7·5	103·04	0·77	16·9	23·1	173·30
Lennoxville Roxie 3rd	4– 3	Jan. 7–27	358	11,353·5	31·71	4·54	515·43	606·39	242·56	26·87	269·43	2,746	8,505	2,204	4·0	68·77	0·61	11·3	28·7	200·66
Lennoxville Roxie	9– 0	Mar. 29–26	25[illegible]	9,711·7	37·94	4·22	410·35	482·76	193·10	23·07	216·17	2,112	10,522	2,228	4·0	62·37	0·64	12·9	27·1	153·80
Highland Betsy 2nd	6– 7	Jan. 9–27	235	9,604·3	40·87	4·75	456·71	537·30	214·92	22·67	237·59	2,860	8,265	2,184	3·5	69·29	0·72	12·9	27·1	168·30
Lennoxville Duchess	3– 9	May 16–26	411	8,817·7	21·45	4·35	383·57	451·26	180·50	20·92	201·42	2,597	12,842	2,838	5·5	77·81	0·88	17·2	22·8	123·61
Lennoxville Marjorie 3rd	3–11	Mar. 15–26	292	8,381·3	28·70	3·81	319·57	375·97	150·39	20·01	170·40	2,070	9,845	1,918	4·0	59·49	0·71	15·8	24·2	110·91
Lennoxville Roxie 2nd	7– 3	Dec. 14–26	250	7,554·2	30·22	4·20	317·78	373·86	149·54	17·95	167·49	2,440	9,260	2,248	3·5	64·73	0·86	17·3	22·7	102·76
Lennoxville Bettina 2nd	3– 9	Mar. 29–26	278	7,221·2	25·98	3·43	247·99	291·75	116·70	17·32	134·02	1,848	9,824	1,896	4·0	56·04	0·78	19·2	20·8	77·98
Lennoxville Mary 3rd	6– 2	July 23–26	403	6,654·9	16·51	3·92	261·44	307·56	123·02	15·87	138·89	2,155	11,745	2,248	7·5	70·18	1·05	22·8	17·2	68·71
Lennoxville Dairymaid 2nd	7–10	Feb. 10–27	228	6,514·2	28·57	3·82	248·70	292·59	117·04	15·55	132·59	1,842	5,320	1,820	4·5	49·64	0·76	17·0	23·0	82·95
Lennoxville Susie	7– 3	June 1–26	272	6,395·9	23·51	3·73	238·82	280·96	112·38	15·29	127·67	1,732	9,918	1,983	4·0	54·79	0·86	19·5	20·5	72·88
Lennoxville Pansy 2nd	2– 9	May 21–26	313	5,030·0	16·07	4·18	210·17	247·26	98·90	11·96	110·86	1,538	11,043	2,128	4·0	54·14	1·08	21·9	18·1	56·72
Lennoxville Dairymaid 4th	5– 6	Oct. 16–26	288	5,018·9	17·43	4·03	202·35	238·00	95·20	11·95	107·15	1,933	9,725	2,248	4·5	59·32	1·18	24·9	15·1	47·83
Lennoxville Dairymaid 3rd	6– 8	Dec. 17–26	209	4,276·6	20·46	3·76	160·89	189·28	75·71	10·22	85·93	1,770	8,290	2,200	2·5	51·53	1·20	27·2	12·8	34·40
Lennoxville Bettina	10– 0	Oct. 27–26	276	3,239·6	11·74	3·06	99·32	116·85	46·74	7·81	54·55	1,377	9,340	2,248	2·5	47·40	1·46	40·0	00·0	7·15
Total for herd (15 cows)			4,633	113,225·2			4,592·10	5,402·39	2,160·94	269·56	2,430·50	32,409	151,785	34,129	65·5	948·54				1,481·96
Average for herd (15 cows			309	7,548·3	24·43	4·06	306·14	360·16	144·06	17·97	162·03	2,160	10,119	2,275	4·37	63·24	0·88	17·6	22·4	98·80

Jerseys

Maplehurst Fox's Roxanna	6– 3	Mar. 19–26	346	8,845·2	25·56	4·91	434·77	511·50	204·60	20·83	225·43	2,482	10,915	1,808	4	66·83	0·76	13·1	26·9	158·60
Sophie Magnet's Corinne	6– 9	Nov. 5–26	281	8,072·2	28·73	5·50	444·58	523·04	209·22	18·87	228·09	2,907	9,550	1,824	4	71·22	0·88	13·6	26·4	156·87
Maxwelton Sultan's Betty	2– 3	Jan. 7–26	388	7,980·1	20·57	6·54	521·97	614·08	245·63	18·41	264·04	2,416	12,350	2,072	4	69·05	0·87	11·2	28·8	194·99
Sultana of Valley View	3– 4	Sept. 1–25	577	6,973·3	12·09	7·34	511·85	602·18	240·87	15·93	256·80	2,180	20,091	2,936	6	83·58	1·20	13·9	26·1	173·22
Double Oxford Pearl	3– 4	Nov. 9–26	387	5,981·4	15·46	6·24	373·80	439·76	175·90	13·85	189·75	2,352	12,230	2,127	5·5	70·38	1·18	16·0	24·0	119·37
Kingsway's Beauty Spot	7– 2	July 11–26	324	5,449·9	16·82	5·20	283·66	333·72	133·49	12·79	146·28	1,855	10,485	1,824	3·5	55·10	1·03	16·8	23·2	90·18
Mascot Mary Belle	3– 1	Oct. 28–26	232	5,149·5	22·20	5·80	299·08	351·86	140·74	11·99	152·73	1,993	8,940	1,824	2	53·60	1·04	15·2	24·8	99·13
Premier's Pinehurst Lottie	4– 1	Nov. 23–26	311	3,454·8	11·11	6·10	211·00	248·24	99·30	8·02	107·32	1,605	10,460	1,824	5·5	55·31	1·60	22·3	17·7	52·01
Total for herd (8 cows)			2,846	51,906·4			3,080·71	3,624,38	1,449·75	120·69	1,570·44	17,790	95,021	16,239	34·5	526·07				1,044·37
Aver. for herd (8 cows)			356	6,488·3	18·23	5·93	385·09	453·05	181·22	15·09	196·30	2,224	11,878	2,030	4·31	65·76	1·02	14·5	25·5	130·55

Shorthorns

Village Ruby	10– 1	Oct. 13–26	280	6,779·2	24·21	3·80	257·82	303·32	121·33	16·19	137·52	2,519	9,700	2,248	4	67·32	0·99	22·2	17·8	70·20
Lady Hope 10th	7– 3	Nov. 5–26	360	5,612·7	15·59	3·97	223·29	262·69	105·08	13·37	118·45	2,171	11,190	2,292	5	66·01	1·18	25·1	14·9	52·44
Lady Hope 13th	2–11	Sept. 2–26	320	5,447·9	17·02	4·50	245·40	288·70	115·48	12·90	128·38	2,058	10,000	2,248	5	62·36	1·14	21·6	18·4	66·02
Autumn Rose 5th	5– 4	Jan. 25–27	270	5,295·0	19·61	4·42	234·03	275·33	110·13	12·55	122·68	1,908	9,830	2,142	4·5	58·68	1·11	21·3	18·7	64·00
Lennoxville Ruby	4– 0	Nov.17–26	257	5,171·8	20·12	4·08	211·11	248·36	99·34	12·31	111·65	2,096	8,180	2,120	2·5	55·94	1·08	22·5	17·5	55·71
Gem of Maple Grove	7–10	July 12–26	444	4,900·5	11·04	4·57	224·19	263·75	105·51	11·59	117·10	1,540	12,295	2,448	8·5	64·08	1·31	24·3	15·7	53·02
Gem of Lennoxville 2nd	4– 0	Mar.17–27	259	4,294·2	16·58	4·26	183·30	215·65	86·26	10·20	96·46	1,668	8,230	1,894	4·5	51·69	1·20	24·0	16·0	44·77
Total for herd (7 cows)	.....	.....	2,190	37,501·3	.....	.....	1,579·14	1,857,80	743·13	89·11	832·24	13,960	69,425	15,392	34	426·08	.....	.....	.....	406·16
Aver. for herd (7 cows)	.....	.....	313	5,357·3	17·12	4·22	225·59	265·40	106·16	12·73	118·89	1,994	9,918	2,199	4·9	60·87	1·14	23·0	17·0	58·02

HORSES

There are at present at the Experimental Station 19 horses, 2 yearlings, 2 two-year-old and 1 three-year-old colts, 13 work horses and 1 driver.

More horses are required to do the work in spring and summer than in winter, therefore, in winter the idle horses are turned into yards during the day to give them exercise. They are fed as economically as possible on hay, a little bran and a few roots.

COST OF HORSE LABOUR

The following table gives the cost per hour of horse labour performed at the Station and shows how it was determined.

COST OF HORSE LABOUR

Number of work horses	No.	12
Average value of each horse	$	200
Total work done during year by 12 horses	hrs.	16,664
Cost of feed for 12 horses—		
39,636 pounds oats at $2 per cwt.	$	792 72
12,743 pounds ground oats at $2.10 per cwt.	$	267 60
2,847 pounds bran at $1.60 per cwt.	$	45 55
70,080 pounds hay at $8 per ton	$	280 32
Total cost of feed for 12 horses for 12 months	$	1,386 19
Average cost of feed per horse for 12 months	$	115 51
Labour (stable attendance), 2,190 hours at 30 cents per hour	$	657 00
Interest (6 p.c. on $2.400; value of horses)	$	144 00
Shelter, $20 per horse	$	240 00
Harness (depreciation, repairs, interest), $7.50 per horse	$	90 00
Miscellaneous (shoeing, veterinary, brooms, brushes)	$	132 96
Total cost of 16,664 hours horse labour	$	2,650 15
Average cost per hour horse labour	cts.	15 90
Average cost per hour horse labour for past 7 years	"	12 79

COST OF FEED TO RAISE COLTS FROM BIRTH TO THREE YEARS

Number of colts—2.
Period—June 4, 1924, to June 4, 1927.

Kind of Feed		First year	Second year	Third year	Total
Hay	lb.	3,048	3,892	6,056	12,996
Oats	"	848	1,082	1,272	3,202
Bran	"	700	498	582	1,780
Ground oats	"	.....	628	700	1,328
Roots	"	444	880	878	2,202
Pasture	days	167	180	180	527
Statement of Cost					
Hay at $8 per ton	$	12 19	15 57	24 22	51 98
Oats at $1.80 per cwt.	$	15 26	19 48	22 90	57 64
Bran at $1.47 per cwt.	$	10 29	7 32	8 55	26 16
Ground oats at $2 per cwt.	$	.....	12 56	14 00	26 56
Roots at $3 per ton	$	0 67	1 32	1 32	3 31
Pasture at $0.75 per month first year	$	4 17	.....	.....	4 17
Pasture $1.50 per month	$	.....	9 00	9 00	18 00
Total cost of feed	$	42 58	65 25	79 99	187 82
Cost of feed per colt	$	21 29	32 62	39 99	93 91

SHEEP

The flock numbered 63 head on December 31, 1927, 27 of these being registered Oxford Down ewes, 1 registered Oxford Down ram, 28 grade Oxford Down ewes, 1 registered Shropshire ram, 1 registered Cheviot ram for cross-breeding work and 5 cross-bred Cheviot ewes.

Some cross-breeding work is being carried on to ascertain the value of these crosses as to quality and finish of market lambs. Three lots of grade Oxford Down ewes were used for this experiment. The results are given in this sheep report.

From April 15 to May 1 is considered about the right time to have lambs born for market purposes, as the weather is milder then and the ewes soon get on to grass, which is one of the best and most economical feeds to produce milk for the young lambs. The market demand is for a medium-sized lamb of good quality. The lambs are weaned the last of August and turned on to good fresh feed. This gives the ewes time to get into good condition before breeding.

The sheep and lambs are dipped before they are turned to pasture; all the lambs are docked and the ram lambs for market are castrated when ten days old.

The wool is sold through the Canadian Co-operative Wool Growers Association, which has its Provincial warehouse and grading station for Quebec at Lennoxville. It is the most practical and profitable way of marketing wool on a graded basis.

COST OF KEEPING A BREEDING FLOCK OF SHEEP

Number of ewes January 1, 1927	No.	46
Number of ewes December 31, 1927	"	43
Value of ewes January 1, 1927, at $12 each	$	552 00
Cost of feed—		
16,442 pounds of hay at $8 per ton	$	65 77
16,442 pounds of ensilage at $3 per ton	$	24 66
6,463 pounds meal at $35 per ton	$	113 10
6 months pasture at 20 cents per head per month	$	52 80
Total cost of feed	$	256 33
Interest on investment, 6 per cent of $552	$	33 12
Depreciation and replacement: 14 per cent of $552	$	77 28
Total charges against ewes	$	366 73
Average charge per ewe (46 ewes)	$	7 97
Value of wool per fleece, 7·40 pounds at 24·55 cents per pound	$	1 82
Average cost of keeping ewes (less value of fleece)	$	6 15
Average cost of feed per ewe	$	5 57

It will be noted from the above figures that the flock of ewes numbered 46 the first of January and there were 43 ewes on December 31, leaving a loss of 3 ewes during the year, which is covered by the 14 per cent charge for depreciation and replacement.

COST OF KEEPING A RAM FOR ONE YEAR

Value of ram January 1, 1927	$	50 00
Cost of feed—		
366 pounds hay at $8 per ton	$	1 46
366 pounds ensilage at $3 per ton	$	0 55
274 pounds meal at $35 per ton	$	4 79
6 months pasture at 20 cents per month	$	1 20
Total cost of feed per ram per year	$	8 00
Interest on investment, 6 per cent of $50 (value of ram)		3 00
Depreciation charge, 25 per cent of $50	$	12 50
Total charge against ram	$	23 50
Value of fleece, 12 pounds at 24·55 cents per pound	$	2 95
Cost of keeping ram (chargeable against lambs)	$	20 55

NOTE.—The depreciation charge on ram is figured at 25 per cent as a ram's usefulness is about four years' duration.

COST OF RAISING LAMBS TO MARKET AGE

Number of lambs saved for market from 46 ewes	No.	55
Average number of lambs per ewe	"	1·20
Average weight of lambs at birth	lb.	9·52
Average weight of lambs at weaning	"	75·47
Average weight of lambs when marketed	"	96 10
Average value of lambs at 10·5 cents per pound	$	10 09
Cost of keeping 46 sheep (less value of wool)	$	282 90
Cost of keeping ram (less value of wool)	$	20 55
Three months pasture for 55 lambs at 20 cents per head per month	$	33 00
Cost of extra labour at lambing time	$	15 00
Medicine	$	5 00
Total cost of raising 55 lambs to market age	$	356 45
Average cost of raising a lamb to market age	$	6 48

The results show that it cost $6.48 to raise a lamb to market age. With a production of 1.20 lambs per ewe, and each lamb worth $10.09, the profit per ewe was $4.33.

CROSS-BREEDING EXPERIMENT WITH SHEEP FOR MARKET PRODUCTION

Object of Experiment.—To ascertain the results of crossing Shropshire, Cheviot and Oxford Down rams with high-grade Oxford Down ewes for market lambs.

Plan of Experiment.—Three lots of grade Oxford Down ewes (two lots of ten and one of eight) were used for this experiment. In lot 1, ten ewes were bred to a registered Shropshire ram. Lot 2, comprising ten ewes, was bred to a registered Cheviot ram, and in lot 3 eight ewes were bred to a registered Oxford Down ram. The weight of lambs at birth, weaning and marketing, also the dressed weight, grading and percentage of the different grades per lot as well the shrinkage of the different grades in the various lots and dates of weaning and marketing will be found in the following table. The grading was done by a qualified grader from the Live Stock Branch, Ottawa.

—		Lot 1	Lot 2	Lot 3
		High-grade Oxford Down ewes bred to Shropshire ram	High-grade Oxford Down ewes bred to Cheviot ram	High-grade Oxford Down ewes bred to Oxford Down ram
Number of ewes bred	No.	10	10	8
Number of lambs raised	"	12	13	11
Total weight of lambs at birth	lb.	111·87	128·87	102·69
Average weight of lambs at birth	"	9·32	9·91	9·33
From birth to weaning—				
Number of days	days	130	133	130
Total weight of lambs at weaning	lb.	941	949	825
Average weight of lambs at weaning	"	78·42	73·0	75·0
Total gain per lot from birth to weaning	"	829·13	820·13	722·31
Average gain per lamb from birth to weaning	"	69·09	63·09	65·66
Average daily gain per lamb from birth to weaning	"	0·53	0·47	0·50
From weaning to marketing—				
Number of days	days	49	49	49
Total weight when marketed	lb.	1,193	1,190	1,072
Average weight per lamb when marketed	"	99·42	91·54	97·41
Total gain per lot from weaning to marketing	"	252	241	247
Average gain per lamb from weaning to marketing	"	21·0	18·54	22·45
Average daily gain per lamb from weaning to marketing	"	0·43	0·38	0·46
Per cent of lambs graded				
Choice	%	58	39	18
Good	%	17	31	46
Fair	%	17	15	18
Poor	%	8	15	18
Shrinkage live weight at station to dressed weight at abattoir in Montreal, Que.—				
Choice	%	50·58	49·06	51·11
Good	%	52·43	52·03	51·01
Fair	%	54·78	52·66	54·78
Poor	%	55 26	55 41	54·86

Deductions.—The table shows that lot 1, comprising ten ewes bred to the Shropshire ram, raised twelve lambs or 1·20 per ewe. Lot 2, ten ewes bred to a Cheviot ram, raised thirteen lambs or 1.30 per ewe, and lot 3, consisting of eight ewes bred to the Oxford Down ram, raised eleven lambs or 1.37 per ewe. Fifty-eight per cent of the lambs in lot 1 graded Choice, 39 per cent in lot 2 and 18 per cent in lot 3. The shrinkage in lot 1 between the live weight at the farm and dressed weight at the abattoir in Montreal was 50.58 per cent on lambs which graded Choice and 55.26 per cent on those which graded Poor. In lot 2, the shrinkage was 49.06 per cent on the lambs which graded Choice and 55.41 per cent on the lot which graded Poor. In lot 3, the shrinkage on the lambs grading Choice was 51.11 and 54.86 on those grading Poor. A fair comparison of prices per grade would be a difference of one-half cent per pound live weight, namely, Choice 11 cents per pound, Good 10½ cents per pound, Fair 10 cents per pound and Poor 9½ cents per pound. Lot 1, with 58 per cent Choice had quite an advantage over lot 2 with 39 per cent and especially over lot 3 which had only 18 per cent Choice. The table also shows that the lots with the highest per cent of Choice grade also had the lowest per cent of shrinkage, therefore, the deduction from these figures shows a slight preference for lot 1, the Shropshire cross, over lot 2, the Cheviot cross, and lot 2 a slight preference over lot 3, the Oxford Down cross as a market lamb proposition.

An effort has been made the past few years, when making a change in the Oxford Down rams used at the Station, to procure a ram of the low-down, well-wooled, medium-sized type in order to develop early-maturing lambs of good quality for market. The results obtained have been very satisfactory.

SWINE

The Yorkshire is the only breed kept at the Station. The herd totalled 30 head December 31, 1927, and included 1 stock boar "Ottawa Beau 29"—123466—4 brood sows and 25 feeders.

In summer the sows are run in pastures well supplied with green feed and fed a small amount of grain. In winter they are kept in yards with colony houses for shelter, which face the south and are placed in the farthest side of the paddock to make the sows exercise as much as possible to get their feed. The following table shows the cost of raising spring and fall litters to weaning age, the average of both lots and the average for the past seven years.

COST OF RAISING PIGS TO WEANING AGE

The following statement is made from records kept of three brood sows. The feed consumed by the sows during the year and the feed the young pigs ate until they were weaned is charged against the sows. The meal mixture consisted of 30 per cent of bran, 25 per cent of oats, 25 per cent of screenings and 20 per cent of middlings.

VALUATION OF FEEDS

Bran	$ 1 50	per cwt.
Oats	2 00	"
Screenings	1 70	"
Middlings	2 00	"
Meal mixture	1 77	"
Skim-milk	0 25	"
Roots	3 00	per ton

COST OF RAISING PIGS TO WEANING AGE—FALL LITTERS

Number of sows	No.	3
Total number of pigs saved from 3 sows	"	26
Average number of pigs saved per sow	"	8·66
Cost of feed—		
2,419 pounds meal at $1.77 per cwt	$	42 82
9,072 pounds skim-milk at $0.25 per cwt	$	22 68
6 months pasture for 3 sows at $0.50 per sow per month	$	9 00
Total cost of feed for sows and pigs to weaning age	$	74 50
Extra labour required at farrowing time, $2 per litter	$	6 00
Cost of service of boar at $1 per litter	$	3 00
Interest on investment, $40 per sow for 6 months at 6 per cent	$	3 60
Cost to raise 26 pigs to weaning age	$	87 10
Cost to raise one pig to weaning age—fall litter	$	3 35

COST OF RAISING PIGS TO WEANING AGE—SPRING LITTERS

Number of sows	No.	3
Total number of pigs saved from 3 sows	"	25
Average number of pigs saved per sow	"	8·33
Cost of feed—		
3,577 pounds meal at $1.77 per cwt	$	63 31
11,144 pounds skim-milk at $0.25 per cwt	$	27 86
900 pounds roots at $3 per ton	$	1 35
Total cost of feed for sows and pigs to weaning age	$	92 52
Extra labour required at farrowing time, $2 per litter	$	6 00
Cost of service of boar at $1 per litter	$	3 00
Interest on investment, $40 per sow for 6 months at 6 per cent	$	3 60
Cost to raise 25 pigs to weaning age	$	105 12
Cost to raise one pig to weaning age—spring litter	$	4 20
Average cost to raise one pig to weaning age—spring and fall litters	$	3 77
Average cost to raise pigs to weaning age for the past 7 years	$	3 11

NOTE.—All costs in connection with the upkeep of the sows are charged against the young pigs, with the exception of labour and housing charges, which are considered to be offset by the value of the manure. Each sow is valued at $40 in order to arrive at the interest charges.

SKIM-MILK VS. TANKAGE FOR MARKET HOGS

Object of Experiment.—1. To determine the value of tankage as a substitute for skim-milk in feeding hogs for market.

2. To determine the quantity of skim-milk that can be fed most profitably to hogs.

3. To determine the quantity of tankage that can be fed to hogs to advantage.

PLAN OF EXPERIMENT

Lot	Breed	Number of hogs	Days on test	Meal ration	Other feeds
I	Yorkshire	9	189	Gr. oats, 2 parts; shorts, 1 part; middlings, 1 part; corn, 1 part; oil cake, ½ part.	Skim-milk, 5 lb., roots 2 lb. per pig per day.
II	Yorkshire	9	167	Same as lot I	Skim-milk 10 lb., roots 2 lb. per pig per day.
III	Yorkshire	9	167	Same as lot I	Tankage 7 p.c., roots 2 lb. per pig per day.
IV	Yorkshire	9	189	Same as lot I	Tankage 10 p.c., roots 2 lb. per pig per day.
V	Yorkshire	9	189	Same as lot I	Tankage in self-feeder, roots 2 lb. per pig per day.

Housing.—The various lots were housed in separate pens and had access to yards for a certain period each day, depending on the weather conditions.

VALUATION OF FEEDS

Mixed meal	$1 95 per cwt.
Skim-milk	0 25 "
Tankage	60 00 per ton
Roots	3 00 "

SKIM-MILK vs. TANKAGE FOR MARKET HOGS

—		Lot 1	Lot 2	Lot 3	Lot 4	Lot 5
		Skim-milk 5 lb. per day	Skim-milk 10 lb. per day	Tankage 7 per cent	Tankage 10 per cent	Tankage in self-feeder
Number of hogs in each lot	No.	9	9	9	9	9
Total initial weight	lb.	135	252	189	203	189
Average initial weight	"	15	28	21	22·5	21
Total finished weight	"	1,655	1,821	1,703	1,691	1,835
Average finished weight	"	183·9	202·3	189·2	187·9	203·9
Number of days in experiment	days	189	167	167	189	189
Total gain per lot	lb.	1,520	1,569	1,514	1,488	1,646
Average gain per hog	"	168·9	174·3	168·2	165·3	182·9
Average daily gain per hog	"	0·89	1·04	1·01	0·87	0·97
Total meal consumed	"	4,316	3,684	4,482	4,619	5,197
Total skim-milk consumed	"	8,505	15,030	.....	.....	.....
Total tankage consumed	"	.....	.....	313	462	950
Total roots consumed	"	3,502	3,006	3,006	3,502	3,502
Pounds of meal eaten per pound of gain	"	2·84	2·35	2·96	3·10	3·16
Pounds of skim-milk eaten per pound of gain	"	5·59	9·58	.....	.....	.....
Pounds of tankage eaten per pound of gain	"	.....	.....	0·21	0·31	0·58
Pounds of roots eaten per pound of gain	"	2·30	1·91	1·98	2·35	2·12
Total cost of feed	$	110·67	113·92	101·30	109·18	135·09
Cost of feed per hog	$	12·30	12·66	11·25	12·13	15·01
Cost of feed per hog per day	cts.	6·51	7·58	6·74	6·42	7·94
Cost of feed per pound of gain	"	7·28	7·26	6·69	7·34	8·21

Deductions.—As will be observed from the table, lot 2, which was fed 10 pounds of skim-milk per pig per day in conjunction with the meal mixture and 2 pounds of roots, made an average gain of 1.04 pounds per day, the largest gains of any lot in the test, at a feed cost of 7.26 cents per pound of gain. Lot 3, fed 7 per cent of tankage with the meal mixture and 2 pounds of roots per pig per day made a gain of 1.01 pounds per day, while the feed cost was 6.69 cents per pound of gain, showing an advantage in favour of tankage of .57 of a cent per pound gain.

In comparing the feeding of different amounts of skim-milk the lot fed 10 pounds of skim-milk made an average daily gain of .15 of a pound more than the lot fed 5 pounds, and the cost of feed per pound of gain was practically the same.

Of the three lots on tankage the greatest gains were made by the hogs getting 7 per cent of tankage, at a feed cost of 6.69 cents per pound of gain. Lot 4, fed 10 per cent tankage, gained .87 of a pound per pig per day at a feed cost of 7.34 cents per pound of gain and the lot getting tankage in a self-feeder consumed 18.3 per cent of tankage and gained .97 of a pound per pig per day at a feed cost of 8.21 cents per pound of gain. The above figures indicate that it is not advantageous to feed more than 7 per cent of tankage for pork production when this supplement is fed in conjunction with a suitable meal mixture.

TANKAGE AS A SUBSTITUTE FOR SKIM-MILK FOR DIFFERENT PERIODS OF HOG-FEEDING

Object of Experiment.—To ascertain the value of tankage as a substitute for skim-milk in feeding hogs for different periods.

Plan of Experiment.—Twenty-four pigs divided into four lots of six pigs each were used for this experiment. Lot 1 was fed meal and approximately 8 pounds of skim-milk per pig per day from weaning to finish. Lot 2 was fed meal and 7 per cent of tankage from weaning to finish. Lot 3, meal and skim-milk to four months of age, then tankage to finish and lot 4 meal and skim-milk to five months of age, then tankage to finish. The meal mixture for the four lots the first two months consisted of 2 parts oats, 1 part middlings and 1 part shorts, for the second two months, 2 parts oats, 1 part middlings, 1 part shorts and 1 part corn, and for the last six weeks of the experiment, 2 parts oats, 1 part middlings, 1 part shorts, and 2 parts corn.

VALUATION OF FEEDS

Ground oats	$2 25 per cwt.
Middlings	2 20 "
Shorts	1 85 "
Ground corn	1 75 "
Meal mixture	2 06 "
Tankage	3 87½ "
Skim-milk	0 25 "

TANKAGE AS A SUBSTITUTE FOR SKIM-MILK FOR DIFFERENT PERIODS OF HOG-FEEDING

—		Lot 1	Lot 2	Lot 3	Lot 4
		Meal and skim-milk weaning to finish	Meal and tankage weaning to finish	Meal and skim-milk to 4 mths. old, then tankage to finish	Meal and skim-milk to 5 mths. old, then tankage to finish
Number of hogs in experiment	No.	6	6	6	6
Total initial weight	lb.	126	156	109	160
Average initial weight	"	21	26	18·2	26·7
Total finished weight	"	1,367	1,196	1,195	1,241
Average finished weight	"	227·8	199·3	199·2	206·9
Number of days on test	days	165	165	165	150
Total gain per lot	lb.	1,241	1,040	1,086	1,081
Average gain per hog	"	206·8	173·3	181	180·2
Average daily gain per hog	"	1·25	1·05	1·10	1·20
Total meal consumed	"	3,224	3,372	3,296	3,118
Total tankage consumed	"	.....	233	192	147
Total skim-milk consumed	"	7,866	.....	2,370	3,036
Amount of meal eaten per pound gain	"	2·60	3·24	3·03	2·88
Amount of tankage eaten per pound gain	"	.....	0·22	0·18	0·13
Amount of skim-milk eaten per pound gain	"	6·35	.....	2·19	2·81
Total cost of feed	$	86·07	78·49	81·26	77·52
Cost of feed per head	$	14·34	13·08	13·54	12·92
Cost of feed per head per day	cts.	8·61	7·93	8·21	8·61
Cost of feed per pound gain	"	6·93	7·55	7·48	7·17
Cost of feed per pound gain same experiment in 1926	"	7·06	6·95	7·67	6·74
Cost of feed per pound gain, average for two years	"	6·99	7·25	7·57	6·95

Deductions.—It will be noted from the table that lot 1, which had meal and skim-milk from weaning to finish, made the largest and cheapest gains, with lot 4, fed skim-milk to five months of age, second; lot 3, which had skim-milk to four months of age, third, and lot 2, fed tankage from weaning to finish, fourth. When the lots in a similar experiment, which was conducted in 1926, are figured in to make an average for two years, lot 4, fed meal and skim-milk to five months of age, was the cheapest, with lot 1 second, lot 2, third, and lot 3, fourth. This shows very conclusively that tankage is a very practical substitute for skim-milk when the latter feed is not available. The tankage used is a special 45 per cent protein hog tankage. In the experiments conducted to ascertain the percentage of tankage that can be the most profitably fed to bacon hogs, it was found that 7 per cent is about the amount that can be fed most profitably.

In the field husbandry experiments, a mixture of corn and sunflowers gave the highest yield of dry matter in 1927.

FIELD HUSBANDRY

COST OF PRODUCTION

In order to determine the actual cost of producing the various farm crops, records are kept of the amount of labour used for these crops as well as the amount of seed, twine, manure and other things pertaining to cost of production. This year, 1927, the cost per bushel or per ton as the case may be, has been comparatively low. This is not due to lower cost of labour or any other cost item recorded, but to the higher yields obtained. Tables farther on will contain an itemized account showing how these costs have been determined. The charges used in all cost of production studies this year are as follows:—

	$ cts.	
Rent of land	4 86	per acre
Rent of land=interest on investment and taxes		
Manure	2 00	per ton
Fertilizer—Nitrate of soda	63 00	"
Superphosphate	19 90	"
Muriate of potash	41 50	
Lime	6 30	"
Seed—Oats	1 10	per bushel
Peas	2 55	"
Vetches	2 50	"
Corn	2 30	"
Sunflowers	10 50	per cwt.
Swedes	0 70	per pound
Red Clover	0 38	"
Alsike	0 36	"
Timothy	0 10	"
Barley	1 30	per bushel
Twine	0 17	per pound
Threshing	0 05	per bushel
Manual labour	0 21	per hour
Horse labour	0 10	"
Tractor labour	0 60	"

Return value

	$ cts.	
Hay	10 00	per ton
Oats	0 71	per bushel
Barley	1 05	"
Potatoes	1 00	"
Corn (silage)	Containing 25 p.c. dry matter	
Sunflower (silage)	Containing 25 p.c. dry matter	
O.P.V. (silage)	Containing 25 p.c. dry matter	
	300 lb. silage = 100 lb. hay.	
Turnips	Containing 10 p.c. dry matter	
	600 lb. = 100 lb. hay.	

Due to the fact that there is no actual market price for corn, sunflowers or O.P.V. for silage, these crops have been given a value on the basis of 300 pounds of silage being equal to 100 pounds of hay, assuming that the silage contains 25 per cent dry matter. If the silage contains less dry matter its value is lowered accordingly.

The value of roots is also based on the value of hay. It is estimated that the dry matter of roots should be given a valuation of 25 per cent more than the dry matter of corn silage. On this basis, therefore, 600 pounds of roots is equal to 100 pounds of hay if the roots contain 10 per cent dry matter.

COST OF PRODUCING CORN

It was almost impossible to obtain good seed corn in the spring of 1927, and some of the corn did not come on well due to this cause. However, in spite of this fact some very good corn was grown this year. About 20 acres of a mixture of corn and sunflowers were harvested, and some 13 acres of corn alone.

Due to the exceptionally low dry matter content, the return value for corn is set at a very low figure. The average yield was 15·34 tons per acre and the following table gives a statement of the cost of producing the crop:—

COST OF PRODUCING AN ACRE OF CORN AT LENNOXVILLE

Item	Statement	1927	Six-year average
		$ cts.	$ cts.
Rent of land		4 86	4 86
Manure	6·4 tons at $2 per ton	12 80	12 80
Seed	½ bushel at $2.30	1 15	1 12
Twine	3¾ lb. at 17 cents	0 64	0 56
Machinery (including ensiling outfit)		5 85	5 85
Manual labour	50·6 hours at 21 cents	10 62	11 99
Horse labour	57·0 hours at 10 cents	5 70	6 63
Tractor labour	1·1 hour at 60 cents	0 66	.....
Total cost per acre		42 28	43 81
Yield per acre	tons	15·34	11·36
Cost per ton	$	2 76	3 94
Value per acre	15·34 tons at $1.46 per ton $	22 40	.....
Gain or loss per acre	$	−19 88*	.....

* Minus sign (−) indicates a loss.

COST OF PRODUCING OATS

Approximately 50 acres of oats were grown on the main farm crop area this year. The average yield was 50 bushels per acre. The following table shows a statement of costs on one 13-acre field:—

COST OF PRODUCING OATS AT LENNOXVILLE

Item	Statement	1927	Six-year average
		$ cts.	$ cts.
Rent of land		4 86	4 86
Manure	4·8 tons at $2 per ton	9 60	9 60
Seed	2½ bushels at $1.10	2 75	2 46
Twine	3¼ lb. at 17 cents	0 55	0 56
Machinery		2 85	2 85
Manual labour	19·3 hours at 21 cents	4 05	4 36
Horse labour	25·4 hours at 10 cents	2 54	3 77*
Tractor	1 hour at 60 cents	0 60	.....
Threshing charges	58·9 hours at 5 cents	2 94	3 51*
Total cost per acre		30 74	31 97
Yield per acre	Grain bush.	58·9	45·8
	Straw tons	1·20	.....
Value per acre	Grain $	41 82	.....
	Straw $	4 80	.....
	Total $	46 62	
Profit per acre	$	15 88	
Cost per bushel (considering value of straw)	cts.	46 8	60·7

* Five-year average.

COST OF PRODUCING HAY

One hundred and fifty acres of hay were harvested in 1927 and gave an average yield of 2·57 tons per acre. Costs were figured on the hay crop in a four-year rotation of corn, oats and two years' hay. As one seeding of grass

and clover seed produces two crops, only one-half the cost of seed is charged against each crop. The cost of production was calculated on one 61·4-acre field and is shown in the following table:—

COST OF PRODUCING HAY AT LENNOXVILLE

Item	Statement	1927	Six-year average
		$ cts.	$ cts.
Rent of land		4 86	4 86
Manure	2·4 tons at $2 per ton	4 80	4 80
Seed	½ of 10 lb. timothy at 10 cents	0 50	
	½ of 8 lb. clover at 38 cents	1 52	
	½ of 2 lb. alsike at 36 cents	0 36	2 07
Machinery		2 85	2 85
Manual labour	15·5 hours at 21 cents	3 25	3 17
Horse labour	9·6 hours at 10 cents	0 96	1 05
Total cost per acre	$	19 10	18 90
Yield per acre	tons	2·8	2·49
Value per acre	$	28 00	
Cost per ton	$	6 82	7 56
Profit per acre	$	8 90	

YIELD AND COST OF ROOT AND SILAGE CROPS

For five years an experiment has been in progress to determine as far as possible which of our common silage crops can be grown most economically. Included also in this experiment is a test comparing the yield and cost of producing turnips with that of the silage crops. Corn, sunflowers, oats, peas and vetches, and turnips have been compared for five years, and in 1927 a mixture of corn and sunflowers was included in the project. The following table shows the results to date:—

COMPARISON OF SUCCULENT ROUGHAGES

Item	Corn		Sunflowers		Oats, peas and vetches		Swedes		Corn and sunflowers	
	1927	Five-year average	1927	Five-year average	1927	Five-year average	1927	Five-year average	1927	Five-year average
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Rent	4 86	4 86	4 86	4 86	4 86	4 86	4 86	4 86	4 86	.....
Manure	12 80	12 80	12 80	12 80	12 80	12 80	12 80	12 80	12 80	.....
Seed	1 15	1 16	1 05	0 95	7 25	5 27	2 10	1 95	1 38	.....
Twine	0 64	0 59	0 64	0 65	.....	.....	.....	.....	0 64	.....
Machinery (including ensiling outfit)	5 85	5 85	5 85	5 85	5 85	5 85	2 85	2 85	5 85	.....
Manual labour	14 55	10 27	15 83	12 52	6 74	6 82	29 55	24 07	15 39	.....
Horse labour	5 02	7 64	5 02	8 44	3 50	5 97	6 21	8 79	5 02	.....
Tractor labour	1 38	0 27	1 38	0 27	1 38	0 27	1 38	0 27	1 38	.....
Total cost	46 25	43 44	47 43	46 34	42 38	41 84	59 75	55 59	47 32	.....
Yield per acre green weight	tons 9·81	tons 9·16	tons 19·38	tons 15·56	tons 10·51	tons 7·51	tons 23·48	tons 21·29	tons 19·91	.....
Cost per ton green weight	$4 71	$4 74	$2 44	$3 02	$4 00	$5 74	$2 54	$2 61	$2 38	.....
Yield per acre dry weight	tons 1·05	tons 1·16*	tons 1·95	tons 2·05*	tons 2·12	tons 1·85*	tons 1·57	tons 1·61*	tons 2·46	.....
Cost per ton dry weight	$44 05	$35 88*	$24 32	$20 90*	$19 99	$22 62*	$38 06	$33 14*	$19 23	.....

*Three-year average.

Judging from the experiment so far, sunflowers appear to be giving the best results. While the cost per acre is somewhat higher than corn or the mixture of oats, peas and vetches, the higher yield brings the cost per ton of both green weight and dry matter considerably lower. Because of their height, however, and the fact that the stocks are very brittle and break easily, sunflowers are extremely difficult to handle in the field, which detracts a good deal from their use as a silage crop. The crop is also quite susceptible to the ravages of the larvæ of the Peacock fly, which in some years injure the plants and reduce the crop value very materially.

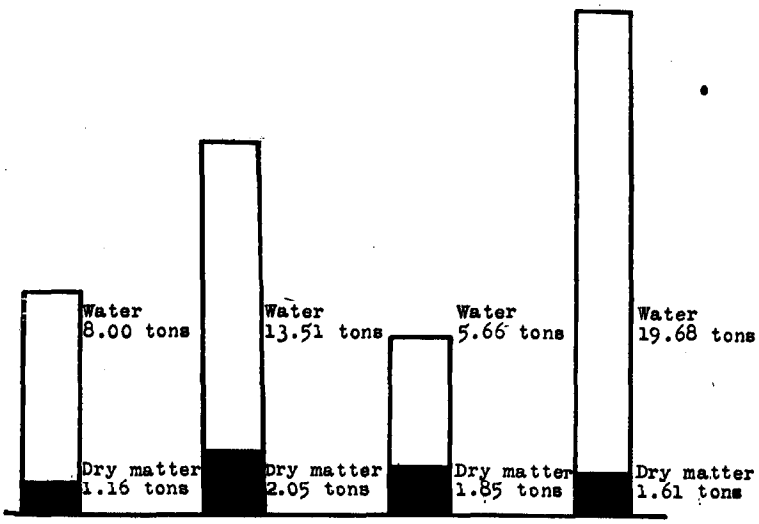
Although high yields of green material are frequently obtained, crops of corn like this are usually low in dry matter content at Lennoxville, and of comparatively small value.

Corn is not a sure crop to grow in most of the districts served by this Experimental Station. The average yield for five years, at the Station, has been only 9.16 tons per acre of green silage and 1.16 tons of dry matter. All of the other crops in the trial have given more economical yields than corn. The problem of securing good seed corn is becoming a very important one. The low yeild in 1927 was quite largely due to poor seed.

Swedes have given excellent yields of green weight, but they are very high in moisture content and require a great deal more labour than any of the other crops. Their large labour requirements largely account for their high cost of production. These factors tend to limit their value as an economical succulent crop.

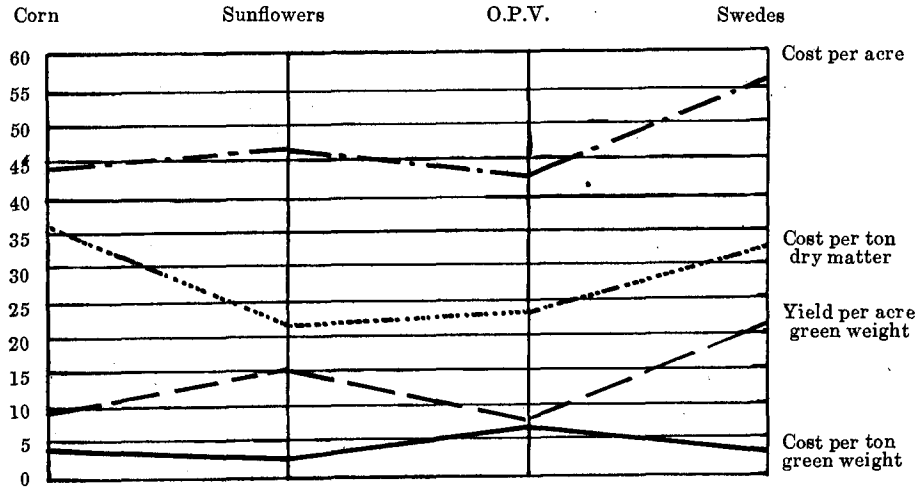
Next to sunflowers, oats, peas and vetches have given the highest yields of dry matter per acre, and at fairly low cost. The labour cost is lower than for any other crop in the test. The high cost of seed is the one drawback in connection with this crop. The silage is of better quality than sunflowers and

where a good silage is required, with a minimum of labour, oats, peas and vetches will fill the requirements very satisfactorily. The peas and vetches are legume crops and as such are valuable in helping to maintain soil fertility. If so desired the O.P.V. crop can also be used as a nurse crop for hay.



Average water content, dry matter and total yield per acre of succulent roughage crops.

Yield and Cost of Producing Succulent Roughages. High Yields reduce the Cost per Ton Green Weight



The one year's results from growing a mixture of corn and sunflowers are very favourable. The total yield per acre is higher than that of any of the other silage crops, while the cost per acre is practically the same as for sunflowers.

CROP ROTATIONS

The yield of crops on the rotation plots this year was considerably higher than the average, with the possible exception of clover. The clover crop seemed to be in good thrifty condition when the snow first disappeared, but the intermittent freezing and thawing afterwards killed a good deal of the stand, with the result that on all the rotations, except the six-year rotation "D", the yield of clover was light. The crop on rotation "D" had an exceptionally strong growth, and apparently was able to survive the unfavourable spring weather. The corn yields were particularly high, in fact from five to six tons higher than the average and considerably higher than any year since the rotations were started. The yield of grain and timothy hay was also higher than at any time in the six years during which the rotations have been in operation.

A brief description of the five different rotations under test at this Station is given in this report. The charges used in arriving at the cost of producing the crops, and also their return value, are the same as those tabulated in the section dealing with " cost of producing crops ". Manure is applied at a rate equivalent to four tons per acre for each crop in the rotation. Two dollars is charged against the manure, $1 for the manure itself and $1 for the cost of applying it. The hay crop is seeded at the rate of 8 pounds of red clover, 2 pounds of alsike, and 10 pounds of timothy per acre.

ROTATION "A" (FIVE YEARS' DURATION)

First year—Corn.
Second year—Barley.
Third year—Clover.
Fourth year—Timothy.
Fifth year—Oats.

Manure is applied to the corn in this rotation at the rate of 20 tons per acre. Two-fifths of the total crop is made up of grain, two-fifths hay and one-fifth corn. This makes a very well balanced rotation suitable for a farmer who feeds considerable live stock. Part of the hay area could be used as pasture land where no other fields are available. It is also a fairly satisfactory combination from a cash-crop standpoint. Although, due to climatic conditions in this district, it is practically impossible to grow corn to maturity, fair yields of green corn were obtained in 1927, but the low dry matter content reduced the value of the crop very materially. This condition tends to lower the total returns from this rotation as well as the other other rotations in which corn is grown. The following table shows the yield, value of crops, cost of production and profit or loss for rotation "A" in 1927, and also the average for the period since the trials were started.

ROTATION "A"

Crop	1927				Average			
	Yield	Value	Cost	Profit or loss	Yield	Value	Cost	Profit or loss
		$ cts.	$ cts.	$ cts.		$ cts.	$ cts. (6 years)	$ cts.
Corn	17·69 tons	25 83	46 19	−20 36	12·86 tons	26 07	47 58 (5 years)	−21 51
Barley (Grain)	36·50 bush.	43 44	30 87	12 57	31·40 bush.	36 29	30 84 (4 years)	5 44
Barley (Straw)	1·28 tons	.....	.....	.....	1·21 tons			
Clover	2·39 tons	23 90	21 73	2 17	2·57 tons	26 64	21 66 (5 years)	4 98
Timothy	2·68 tons	26 80	17 73	9 07	2·27 tons	23 71	17 44 (4 years)	6 27
Oats (Grain)	56·50 bush.	45 15	24 02	21 13	43·30 bush.	32 32	23 38	8 94
Oats (Straw)	1·26 tons	.....	.....	.....	1·18 tons			
Total from rotation	.....	165 12	140 54	24 58	.....	145 03	140 90	4 12
Average per acre	.....	33 02	28 11	4 92	.....	29 01	28 18	0 82

N.B —Minus sign (−) denotes loss.

ROTATION "B" (FOUR YEARS' DURATION)

First year—Corn.
Second year—Oats.
Third year—Clover.
Fourth year—Timothy.

The corn crop in this four-year rotation receives an application of 16 tons of manure per acre. On one-half of the rotation hay is grown while the other half is divided equally to grow corn and oats. Such a rotation provides for a large amount of roughage both dry, in the form of hay, and succulent in the corn crop. A statement of yield, value, cost and profit or loss follows:—

ROTATION "B"

Crop	1927				Average			
	Yield	Value	Cost	Profit or loss	Yield	Value	Cost	Profit or loss
		$ cts.	$ cts.	$ cts.		$ cts.	$ cts. (6 years)	$ cts.
Corn	16·21 tons	23 67	42 99	−19 32	10·62 tons	21 54	44 15 (4 years)	−22 60
Oats {Grain	69·00 bush.	53 43	32 25	21 18	57·30 bush.	41 47	31 68 (4 years)	9 79
Oats {Straw	1·36 tons				1·32 tons			
Clover	2·12 tons	21 20	20 13	1 07	2·23 tons	23 13	20 06 (5 years)	3 07
Timothy	3·17 tons	31 70	16 93	14 77	2·48 tons	25 67	16 84	8 83
Total from rotation		130 00	112 30	17 70		111 81	112 73	−0 91
Average per acre		32 50	28 07	4 42		27 95	28 18	−0 23

N.B.—Minus sign (−) denotes loss.

ROTATION "C" (THREE YEARS' DURATION)

First year—Corn.
Second year—Oats.
Third year—Clover.

Manure is applied to corn at the rate of 12 tons per acre in this rotation. The area is divided equally between corn, oats and clover; one-third for each crop. There is not enough hay in this rotation to balance the grain and corn crop. The high acreage of corn lowers the profits very considerably, and from an actual cash standpoint such a rotation is not to be recommended. It has a use, however, as a means of building up run-down soil. The large amount of cultivation, as well as a legume crop every three years, should increase soil fertility. Such a rotation might profitably be used on a portion of the farm as a means to this end, while another part of the farm could be used as a supplemental rotation, in which a larger percentage of hay might be grown, until such time as the productivity of the soil was increased, then the whole farm could be brought into regular rotation again. The following table shows a very small margin of profit from this three-year rotation:

ROTATION "C"

Crop	1927				Average			
	Yield	Value	Cost	Profit or loss	Yield	Value	Cost	Profit or loss
		$ cts.	$ cts.	$ cts.		$ cts.	$ cts. (6 years)	$ cts.
Corn	18·03 tons	26 32	42 19	−15 87	11·04 tons	22 10	43 14 (4 years)	−21 04
Oats {Grain	70·20 bush.	55 56	29 91	25 65	54·20 bush.	39 62	28 78 (4 years)	10 84
Oats {Straw	1·43 tons				1·26 tons			
Clover	1·88 tons	18 80	20 91	−2 11	2·02 tons	20 91	20 60	0 31
Total from rotation		100 68	93 01	7 67		82 63	92 52	−9 89
Average per acre		33 56	31 00	2 56		27 54	30 84	−3 30

N.B.—Minus sign (−) denotes loss.

ROTATION "D" (SIX YEARS' DURATION)

First year—Corn.
Second year—Barley.
Third year—Clover.
Fourth year—Timothy.
Fifth year—Timothy.
Sixth year—Oats.

In this rotation the application of manure is divided. Sixteen tons to the acre is applied for corn, while first year timothy receives a top-dressing of 8 tons per acre. One-half the area is devoted to hay crop, one-third to grain and one sixth to corn. This rotation is slightly more varied, and perhaps more complicated, than most of the other rotations. Corn, which as mentioned before is not well adapted to this section plays a small part in this combination of crops. With only one-sixth of the area in corn the high cost and low returns of the crop do not lower the profits for the whole rotation, to the same extent as in other rotations where a larger area is devoted to it. It may also be noted that the hay crop is left down for three years which lowers the cost of seed, and also lessens cultivation, therefore reducing labour costs. Such a rotation is very suitable for this section, providing as it does plenty of grain for average conditions. It allows for an abundance of hay, and also, some of the hay area might profitably be used for pasture. With the large amount of hay to supply dry roughage, even with the small acreage of corn, there is sufficient green roughage to produce plenty of succulence. It is however, a clean land rotation, as it does not provide for a very large amount of cultivation. Hoed crop only once in six years is perhaps not ideal and with hay left down three years couch grass is liable to become a nuisance. The yield, value, cost and profits are shown in the following table:

ROTATION "D"

Crop	1927				Average			
	Yield	Value	Cost	Profit or loss	Yield	Value	Cost	Profit or loss
		$ cts.	$ cts.	$ cts.		$ cts.	$ cts.	$ cts.
Corn	15·25 tons	22 26	44 59	−22 33	9·52 tons	19 23	45 33 (6 years)	−26 10
Barley—Grain	40·80 bush.	48 00	29 89	18 11	32·00 bush.	36 73	29 59 (5 years)	7 14
Barley—Straw	1·29 tons	.....	.....	.....	1·18 tons			
Clover	3·25 tons	32 50	19 33	13 17	3·00 tons	31 18	19 39 (4 years)	11 79
Timothy	4·41 tons	44 10	22 53	21 57	3·08 tons	32 07	22 57 (5 years)	9 50
Timothy	3·13 tons	31 30	18 53	12 77	2·59 tons	27 23	18 57 (5 years)	8 66
Oats—Grain	69·00 bush.	54 07	25 85	28 22	57·50 bush.	41 95	25 24 (4 years)	16 71
Oats—Straw	1·52 tons	.....	.....	.....	1·43 tons			
Total from rotation	.....	232 23	160 72	71 51	.....	188 39	160 69	27 70
Average per acre	.....	38 70	26 79	11 91	.....	31 40	26 78	4 62

N.B.—Minus sign (−) denotes loss.

ROTATION "E" (FOUR YEARS' DURATION)

First year—Oats.
Second year—Clover.
Third year—Timothy.
Fourth year—Timothy.

Rotation "E" is a grain and hay rotation, 8 tons of manure is applied to the oat crop and 8 tons top-dressed on first year timothy. On one-quarter of the area oats is grown while the other three-quarters is used for hay. This

rotation cuts down labour almost to a minimum. Such a rotation might be used as a supplement, as suggested in connection with rotation "C". It is fairly profitable from an actual cash-crop standpoint, as the following table shows:—

ROTATION "E"

Crop	1927				Average			
	Yield	Value	Cost	Profit or loss	Yield	Value	Cost	Profit or loss
		$ cts.	$ cts.	$ cts.		$ cts.	$ cts. (4 years)	$ cts.
Oats.....{Grain	38·50 bush.	33 53	29 72	3 81	45·60 bush.	34 21	30 85	3 36
{Straw	1·55 tons	.....	.....	.....	1·38 tons		(4 years)	
Clover.....	2·95 tons	29 50	19 33	10 17	2·88 tons	29 85	19 39	10 46
							(5 years)	
Timothy.....	3·52 tons	35 20	22 53	12 67	2·83 tons	29 67	22 59	7 08
							(5 years)	
Timothy.....	3·07 tons	30 70	19 32	11 37	2·33 tons	24 05	19 37	4 68
Total from rotation....	.....	128 93	90 91	38 02	.....	117 78	92 20	25 58
Average per acre.....	.....	32 23	22 73	9 50	.....	29 44	23 11	6 39

N.B.—Minus sign (—) denotes loss.

SEEDING GRASS SEED

Four years ago an experiment was started, with the object in view of determining how late in the season it would be possible to seed grass seed, in order to obtain a stand of hay for the following year. The need for such an experiment presented itself when in the season of 1921 a very high percentage of the new seeding failed to survive the extremely dry summer. It seemed advisable to start this experiment then to learn if it would be possible in such a circumstance, where it is quite apparent that there is not sufficient growth of new grass seeding to warrant leaving it for the next year's hay crop, to reseed the grass after the nurse crop is harvested. The project comprises five different methods or dates of seeding the hay mixture in a four-year rotation of corn, oats, clover and timothy. Manure is applied to the corn crop at the rate of 16 tons per acre. No grass or clover seed is sown with the grain crop when it is planted in the spring. As soon as the oats are harvested in the fall, however, the stubble land is disked and the first seeding of grass seed is broadcast on to the plots in August, at the rate of 8 pounds of red clover, 2 pounds of alsike and 10 pounds of timothy per acre. The second seeding is done in September, the third in November, another one the following year when the seed is scattered on the snow in early spring, and still another where the timothy is seeded in September, and the clover on the snow in spring. The experiment is carried on in duplicate, on one-twentieth acre plots. The following table shows the yields of clover from the different seedlings for the past four years as well as the average for the period.

SEEDING GRASS SEED ON DIFFERENT DATES

Treatment	1924	1925	1926	1927	Average
	tons	tons	tons	tons	tons
Seed hay in August.....	0·37	0·84	0·65	1·23	0·77
Seed hay in September.....	0·17	0·79	.....	.....	0·24
Seed hay in October.....	0·16	0·61	.....	.....	0·19
Seed hay in spring on snow.....	0·36	0·51	.....	.....	0·22
Seed timothy in September, clover in spring.....	0·66	1·02	.....	.....	0·42

The results indicate that the only seeding which can be depended upon to give any worth-while yield at all is the August seeding. In 1924 and 1925 the crop was cut on the other plots, but most of the small yields from them was made up of weeds. In 1926 and 1927, the crop on the four later treatments was so light that it was not worth harvesting and in the case of the September, October and spring seeding the land was ploughed and reseeded. It appears that fall seeding later than August is more or less a waste of time and seed. Even the August yields of clover are very light and the second year hay has only averaged 1·31 tons per acre. The experiment will be continued in order to obtain more conclusive data.

DEPTH OF PLOUGHING

The depth of ploughing experiment, as reported in the 1926 report of this Station, was continued this year. The yields this year of corn and oats were slightly higher on the plots on which the shallow ploughing was done. Considering the results for the past five years, there appears to be no very marked difference in yield due to shallow or deep ploughing, especially on fairly light soil. It is important, however, to disk or cultivate thoroughly in order to prepare a good seed-bed. The following table shows the results of both treatments for 1927 and also the average for five years (four years in the case of oats) on all four crops in the rotation.

DEPTH OF PLOUGHING EXPERIMENT—1923 TO 1927

Treatment	Corn		Oats		Clover		Timothy	
	1927	Five-year average	1927	Four-year average	1927	Five-year average	1927	Five-year average
	tons	tons	bush.	bush.	tons	tons	tons	tons
Ploughing four to five inches deep.	16·89	12·23	51·1	49·6	1·69	1·91	1·71	1·85
Ploughing seven inches deep.....	13·93	11·63	53·1	48·7	1·89	1·69	1·85	1·98

PREPARING SOD LAND FOR CORN

Of the four methods of preparing sod land for corn, spring ploughing has given the highest yields during the five years which the project has been in progress at this Station. The experiment is carried on in a rotation of corn, oats, clover and timothy. Each series is tested in duplicate on one-twentieth acre plots. As mentioned above, four treatments are under observation. On one series the timothy sod is manured in the late fall at the rate of 16 tons per acre and the land fall ploughed. The second treatment consists of manuring the land at 16 tons per acre, in the winter or early spring, and spring ploughing. On the third series the timothy sod is ploughed in August, manured in the winter or early spring, and reploughed in the spring. The fourth plot is ploughed in late fall, manure is applied in winter or early spring, and disked in when the land is being prepared for seeding. The following table shows the yield of corn from the different treatments for 1927, and also the average yield for the five years:—

PREPARING SOD LAND FOR CORN

Treatment	1927	Five-year average
	tons	tons
Manure and fall plough for corn.....	14·58	11·30
Manure in winter and spring plough for corn.....	18·87	13·63
Plough August, manure and plough again in spring.....	14·99	9·82
Plough in fall, manure in winter and disk in spring.....	17·27	10·61

The spring ploughing shows an average yield of 2·33 tons more than any other treatment in the test. The other treatments apparently make very little difference on the yield one way or the other as the widest variation between any of the three is 1·52 tons. It might be mentioned, however, that the land which is spring ploughed is harder to keep free from weeds than some of the other treatments. Ploughing timothy sod as soon as the hay is off, top-working occasionally throughout the remainder of the growing season, and reploughing in spring or fall is a splendid practice for weed eradication, and is especially recommended for the control of couch grass.

USE OF LIME

Five years ago a project was started to determine what effect an application of ground limestone would have on the yield of crops in a rotation of corn, oats, clover and timothy. Manure is applied for the corn crop at the rate of 16 tons per acre. Just before seeding the grain in the second year of the rotation ground limestone is broadcast on the land at the rate of two tons per acre and harrowed in. The following table shows the increase in yield due to the treatment with lime:—

USE OF LIME

——	Corn		Oats		Clover		Timothy	
	1927	Five-year average	1927	Five-year average	1927	Five-year average	1927	Five-year average
	tons	tons	bush.	bush.	tons	tons	tons	tons
Lime, 2 tons per acre	17·65	14·03	62·6	53·8	1·24	1·32	1·48	1·61
No lime	16·57	11·66	55·1	41·6	0·64	0·78	1·17	0·93
Increase from lime	1·08	2·37	7·5	12·2	0·60	0·54	0·31	0·68

Each crop in the rotation has returned a decided increase in yield on the limed plot. The corn crop over the five-year period shows an average increase of 2·37 tons per acre, the increase of oats is 12·2 bushels, clover hay 0·54 of a ton and timothy 0·68 of a ton.

The increase in return value on the limed areas is shown in the following table. The cost of lime has been deducted from the value of the crops on the limed plots. Lime in 1927 cost $6.30 per ton.

VALUE OF CROPS IN "USE OF LIME" PROJECT

——	Corn		Oats		Clover		Timothy	
	1927	Five-year average	1927	Five-year average	1927	Five-year average	1927	Five-year average
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Lime, 2 tons per acre	26 68	36 92	45 74	35 12	9 25	10 70	11 65	13 39
No lime	28 00	32 78	42 20	29 54	6 40	7 99	11 70	9 58
Increase from lime	−1 32	4 14	3 54	5 58	2 85	2 71	−0 05	3 81

N.B.—Minus sign (−) denctes decrease.

Corn has given a five-year average increase in value on the limed plot of $4.14. The value of oats shows an increased value of $5.58, while clover returns $2.71 and timothy $3.81 making a total profit from the four crops, after deduct-

ing the cost of lime, of $16.24. It can readily be seen, therefore, that applying lime is a profitable practice on acid soils. Much of the crop land in the Eastern Townships would profit by applications of lime.

OTHER INVESTIGATIONS

In addition to the experiments already outlined in this report, there are a number of other projects under test in connection with the field husbandry work. A most interesting one is that dealing with manure and commercial fertilizers for the potato crop. The findings from this experiment were published in the Field Husbandry section of the 1926 report of the Lennoxville Station. The yields for 1927 were such as to further bear out the results as outlined in the former report. Commercial fertilizers can be used with success as a means of supplying fertility for the potato crop.

Large areas in the Eastern Townships are left year after year as so-called rough pasture land. A great deal of this land produces very little, if any, pasture and much of it might more appropriately be called waste land. Certainly in most sections these pasture areas are the most neglected part of the farms, and if something could be done to make them more productive, the problem of summer feed for live stock would be simplified to a large extent. It was with the object in view of finding some economical way of increasing the carrying capacity of these pasture lands, that a rather extensive experiment was started in 1927. It is hoped that in the course of a few years, some valuable data will be available as to ways and means of profitably renovating these run-down pastures.

Other projects consist of tile drained versus undrained land, green manure crops, commercial fertilizers for silage crops, quantities of manure to use and place in rotation of applying it, hop's refuse as compared with manure for corn, oats and hay, and the preparation of sod land for grain.

HORTICULTURE

VEGETABLES

POTATO

In general, soil and climatic conditions, as found in the Eastern Townships, are quite satisfactory for the potato crop and although large areas are rare, practically every farmer grows from one to two acres for home supply and as a cash crop. Accordingly, although decidedly a factor in the farm income, the crop is of minor importance in comparison with other lines which demand greater areas of land, and draw more heavily upon the farmer's time. As a result the potato crop seldom receives sufficient attention, and poor to average yields are usually the rule rather than the exception.

Nearly always the greatest lack of attention is found in the control of the Colorado potato beetle and potato blights. Spray pumps or dusters are uncommon. Also the materials used for control are improperly mixed or, as is frequently the case, are unsatisfactory, and when applied with a watering can the results are far from satisfactory. A small sprayer or hand-driven duster is not exceptionally expensive and frequently the increase in crop, due to its use. will more than repay its cost the first season.

SPRAYING VS. DUSTING.—During the past five years a project has been conducted at this Station in which several commercial dusts and one home-mixed preparation has been compared with the Bordeaux mixture and calcium arsenate spray. The dusts are applied with a small hand-driven duster and the spray with an ordinary barrel spray pump. The first applications are made

when the potato plants are about four inches high and are followed by further applications at intervals of approximately two weeks until the vines are killed by frost. Usually at least five applications are made. In the following table an average of the results obtained during the past five years is shown:—

SPRAYING VS. DUSTING—AVERAGE OF RESULTS, 1923 TO 1927

Spray or dust used	Average per cent of beetles and slugs killed by five applications	Yield of potatoes per acre			
		Marketable		Unmarketable	
		bush.	lb.	bush.	lb.
Green potato arsenate (dust)	87·3	406	51	101	30
Hydrated lime 8 lb., calcium arsenate 1 lb. (dust)	94·2	427	37	78	37
Bordeaux arsenate (dust)	81·6	391	7	134	59
Bordeaux 5-12-40, calcium arsenate 1 lb. (spray)	93·0	387	47	102	12
Brown apple (dust)	80·6	385	26	99	39

Although all of the preparations, excepting hydrated lime and calcium arsenate, contain a fungicide, there has been little or no opportunity for a comparison of their fungicidal value as the crop as a whole has been remarkably free from disease of any kind from 1923 to 1926. In 1927, however, blight was very prevalent throughout the district and the plot receiving hydrated lime and calcium arsenate was quite badly diseased, about ten per cent of the potatoes showing rot when dug. Very little damage occurred to any of the other plots, and the fungicidal properties of the dusts and sprays were apparently quite satisfactory. In a comparison of the various preparations, it may be noted that the hydrated lime and calcium arsenate have given the largest yields. This is apparently due to the greater killing power of the preparation, as the most complete control of beetles was obtained with it. Had the other dusts possessed equal value as a poison, it is possible that different results would have been obtained. Also in seasons when blights are prevalent, a fungicide is necessary for their control. Accordingly, although the best results, during the past five years, have been obtained with hydrated lime and calcium arsenate, it cannot be recommended over a dust that will not harm the foliage, yet contains sufficient poison to insure quick killing and a satisfactory fungicide.

Sprouting Seed Potatoes.—Although new potatoes from the south are available on Canadian markets much earlier in the season than they can be grown in our climate, the demand for the new locally grown crop is always good, and the prevailing price high. Accordingly, a very early crop of potatoes may be readily disposed of at a higher price per bushel than the later or main crop.

In general it has been found that the sprouting of seed potatoes before planting adds materially to the earliness of the crop. In order to secure reliable data relative to the district served by this Station, on this question, an experiment has been conducted for four years with the two standard varieties of potatoes, Green Mountain and Irish Cobbler. Following is an average of the results obtained:—

POTATO—SPROUTING EXPERIMENT—AVERAGE OF RESULTS, 1923, 1924, 1926 AND 1927

Variety and method	Average number of days earlier due to sprouting	Date ready for use, 1927	Yield per acre	
			Marketable	Unmarketable
			bush. lb.	bush. lb.
Green Mountains—				
Small whole, dormant		Aug. 15	254 38	66 26
Small whole, sprouted	13·5	July 25	279 49	63 48
Large whole, dormant		Aug. 15	343 40	50 5
Large whole, sprouted	13·3	July 25	307 33	53 56
Cut set, dormant		Aug. 15	291 10	62 48
Cut set, sprouted	10·2	July 27	309 23	79 13
Irish Cobblers—				
Small whole, dormant		Aug. 1	296 0	78 14
Small whole, sprouted	18·5	July 6	292 19	90 21
Large whole, dormant		Aug. 1	278 5	98 3
Large whole, sprouted	16·2	July 6	244 54	101 4
Cut set, dormant		Aug. 1	263 12	72 51
Cut set, sprouted	18·7	July 8	285 33	64 47

AVERAGE YIELD PER ACRE

—	Dormant		Sprouted	
	Marketable	Unmarketable	Marketable	Unmarketable
	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Green Mountain	295 35	65 39	296 29	60 19
Irish Cobbler	274 15	85 24	279 6	63 3

As may be noted from the foregoing table, potatoes of marketable size were available from the sprouted seed from ten to eighteen days earlier than where the seed had been planted in a dormant condition. The average yields, however, were approximately the same. Accordingly, it would seem that the sprouting of seed potatoes before planting can be of value only where the market for locally grown new potatoes is good, and the price sufficiently high to compensate for the additional expense of sprouting and handling.

GARDEN PEA

TEST OF VARIETIES.—In general the season at Lennoxville is practically ideal for garden peas, and, as a rule, excellent yields are obtained. In 1927, however, conditions were particularly favourable and exceptionally good crops were produced by all varieties included in the test. Of the nineteen varieties tested during the past season, the earliest was Alaska, which produced peas ready for use eighty-eight days after sowing. The heaviest yield was obtained with a selection of Telephone, developed at this Station, which produced 36.5 pounds of unshelled peas from one 30-foot row. Other high-yielding varieties were, in order of season: Little Marvel, Blue Bantam, American Wonder, Thomas Laxton, Gradus, and Stratagem. Of these the most suitable for commercial gardeners are: Blue Bantam, Gradus and Stratagem. Under average conditions these varieties will not require brushing and each produces large well-filled pods. For the home or kitchen garden, where labour is not an important factor, both smaller-podded and taller varieties may be used to advantage. Accordingly, Alaska and American Wonder, which, although producing small

pods, also produce heavy yields and are very early, and Telephone, which often grows to a height of eight or nine feet but is the most productive variety which has been tested at this Station, may be recommended.

DISTANCE APART OF PLANTING IN THE ROW.—From the results obtained from this project during the past five years, it would seem that the best results are to be secured by planting the seed of peas quite close together in the row. Usually there is ample rainfall in this district during the growing season to provide sufficient moisture for the requirements of the crop, and, if the soil fertility is high, a thick stand of plants can reach normal development and produce a heavy yield of peas. Following is a statement showing the average results obtained during the past five years with three varieties of peas seeded at different distances apart in the row:—

PEAS—DISTANCE APART OF PLANTING IN THE ROW—AVERAGE OF RESULTS, 1923 TO 1927

Distance apart of planting seed in the row	Yield of unshelled peas from one thirty-foot row					
	English Wonder		Thomas Laxton		Stratagem	
	lb.	oz.	lb.	oz.	lb.	oz.
One-half inch	16	4	18	6	20	5
One inch	14	11	11	14	17	1
Two inches	11	0	9	4	15	5
Three inches	9	9	6	5	9	5

BEANS

TEST OF VARIETIES.—Although the variety test of beans in 1927 was conducted on soil of excellent texture, in good mechanical condition and high fertility, the crop was, as a whole, unsatisfactory, being badly infected with pod spot or Anthracnose.

Of the nineteen varieties tested the greatest resistance to disease was found in Hodson Long Pod, a high-yielding, yellow-podded variety of fair quality. Round Pod Kidney Wax, another yellow-podded variety earlier than Hodson Long Pod and of excellent quality, proved fairly resistant, the first two pickings of beans being quite free from spot. Several strains of Stringless Green Pod also proved partially resistant, beans of marketable quality being obtained from early pickings.

DISTANCE APART OF PLANTING SEED IN THE ROW.—For the past five years, seed of two varieties of beans, Round Pod Kidney Wax and Stringless Green Pod, have been planted at two, four, and six inches apart in the row. So far the closer plantings have given the heaviest yield, but have not proven satisfactory owing to increased infection by Anthracnose. When the seed is planted six inches apart in the row, strong stocky plants are produced which bear well-developed pods and are not readily infected by Anthracnose.

TOMATO

TEST OF VARIETIES.—Owing to the very favourable weather during the fall of 1927, the first killing frost occurring on October 8, all varieties of tomatoes included in the test of varieties produced a normal crop of ripe fruit. Such results are, however, decidedly rare, as the vines are usually killed by frost early in September. Accordingly, late, heavy-yielding varieties which produced the

best crops in the past season are not satisfactory for this district, as in the normal season they would be killed by frost before much of the fruit could ripen.

As recommended in previous reports from this Station, only the earliest varieties of tomatoes are suitable for this district. Of these, the best results have been obtained during the past ten years with the variety Alacrity originated at the Central Experimental Farm, Ottawa. During the past three years a selection made at this Station from the variety Bonny Best has proven slightly superior to Alacrity in that the fruit is smoother and less inclined to crack. In regard to yield and earliness, the two varieties are very similar.

For the past two years, Abbotsford Argo, a variety which is in many respects a novelty, has proven very satisfactory. The plants of this variety are semi-dwarf with a leaf resembling the potato. The fruit is small, very smooth and bright red in colour. Although producing about the same total crop as Alacrity, it differs in that a higher percentage ripens for the early pickings, at which time the price for ripe tomatoes is usually quite high. The seed of this variety was supplied by the originator, Mr. Arthur H. Horn, of Abbotsford, B.C.

RHUBARB

FORCING IN CELLAR.—For the past three years excellent results have been obtained in the growing of rhubarb, during winter, in the cellar below the office building. Large strong plants at least three years old are dug early in November or late in October and allowed to remain unprotected until thoroughly frozen. They are then removed to the cellar and planted very closely in ordinary garden loam. Occasional light waterings are necessary to keep the soil damp, but at no time should it be decidedly wet. At the ordinary cellar temperature, of from forty or forty-five degrees Fahrenheit, the plant will begin to bear in about six weeks and will continue bearing for about the same period. For the past three years the average total yield from six plants has been 37·5 pounds of good-sized stalks.

CABBAGE

TEST OF VARIETIES.—Owing largely to the very favourable season, excellent results were obtained with practically all of the twenty-three varieties and strains of cabbage tested in 1927. Of the early varieties the best results were obtained with Golden Acre a comparatively new sort that has now been tested at this Station for three years. It is apparently a decided improvement over Copenhagen Market, the previously recommended variety for early use, and will no doubt rapidly replace the older variety as it becomes better known.

As a mid-season variety, Succession has proven the most satisfactory for a number of years, although almost equally good results may be obtained by late planting of Golden Acre.

For a late variety Ex. Amager Danish Ballhead is outstanding. It produces an exceptionally firm head of uniform size and excellent keeping quality.

In the usual fall weather of the Eastern Townships, which is characterized by frequent precipitation, most late varieties split badly when nearing full development. Strains of Danish Ballhead, however, rarely evidence this fault, and even during exceptionally wet fall weather, such as was experienced in 1924, splitting of the heads rarely occurs.

As a second choice for a late variety, Enkhuizen Glory has proven quite satisfactory. Following is a four-year average of the results obtained with the principal varieties tested during that period. In each year the seed of all varieties was sown during the second week in May.

CABBAGE—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Ready for use	Average weight per single head		Yield from two thirty-foot rows	
		lb.	oz.	lb.	oz.
Succession	End of July to first of August	8	3	297	15
Copenhagen Market	Second week in July	7	10	274	8
Enkhuizen Glory	First part of September	8	0	252	8
Winnigstadt	Third week in July	6	14	224	7
Fottler Imp. Brunswick	Second week in August	6	6	218	9
Early Paris Market	Third week in July	6	6	199	8
Ex. Amager Danish Ballhead (Ott. Sel.)	September	5	5	184	0

DIFFERENT DATES OF SEEDING.—This project was conducted in 1927, as in former years, with two varieties, namely, Copenhagen Market and Danish Ballhead. The first seedings were made early in May and continued at intervals of about two weeks until the third week in July. Owing to the very favourable fall weather in 1927, heads of marketable size were obtained from all seedings excepting that made on July 23, with Danish Ballhead. Such results are, however, unusual, those obtained in former seasons indicating that it is not advisable to sow Danish Ballhead later than the middle of June, and Copenhagen Market later than the first week in July.

CAULIFLOWER

TEST OF VARIETIES.—Six varieties of cauliflower were tested in 1927. Early Snowball, Early Dwarf Erfurt, Large Algiers, Danish Giant or Dry Weather and Danish Perfection. Of these Early Snowball, which has been grown at this Station for twelve years, is outstandingly the most satisfactory early variety. It produces a compact head of medium size and pure white colour. It is also one of the easiest varieties to handle as the plants seldom " bolt " or form dwarf heads, after transplanting or during hot, dry weather.

As a late variety Danish Giant or Dry Weather has given excellent results. The heads are not as compact as those of Early Snowball, but are of good colour and very large. Owing to the long season it requires for development, the variety is not suitable for very late sowings or for an early crop.

DIFFERENT DATES OF SEEDING.—At Lennoxville, the weather during the growing season is usually very favourable for the development of cauliflower, and very little trouble has been experienced in producing good heads from all seedings of Early Snowball up to the middle of June. With seedings made later than the middle of June, the results are rarely satisfactory. So far little difficulty has been experienced in raising good heads of cauliflower during the middle of the summer, as, owing to absence of extreme heat, and the usual frequent rains, bolting or dwarfing of the heads rarely occurs.

ONION

TEST OF VARIETIES.—The season of 1927 proved exceptionally favourable for onions, and, as a result, the best crop that has been obtained at this Station was harvested. In all nineteen varieties were tested and of these the heaviest yield was secured from a strain of the well-known Red Wethersfield. Following is a statement showing the average results obtained during the past six years with five of the best varieties that have been tested:—

ONION—AVERAGE OF RESULTS, 1922 TO 1927

Variety	Colour	Shape	Yield from two thirty-foot rows	
			lb.	oz.
Extra Early Flat Red	Red	Flat	28	7
Giant Prize Taker	Yellow	Oval	26	11
Red Wethersfield	Red	Slightly flat	26	3
Ailsa Craig	Yellow	Oval	25	10
Yellow Globe Danvers	Yellow	Oval	24	26

Of the varieties listed in the foregoing statement, the most satisfactory for commercial purposes is Red Wethersfield. It is well known to the trade and can be more rapidly disposed of in this district than varieties of different shape or colour. For home use Extra Early Flat Red or Giant Prize Taker are very satisfactory.

TRANSPLANTING ONIONS.—In this project, which has been conducted for the past nine years, increased yields have always been obtained by sowing the seed of onions early in the spring in the hotbed and transplanting to the open ground in late May or early June. In 1927 the yield from two thirty-foot rows of Giant Prize Taker, from seed sown in the open, was 27 pounds, while 38 pounds 2 ounces was secured from an equal area transplanted with plants started in the hotbed. Similar results were obtained with Large Red Wethersfield and Ailsa Craig.

GARDEN BEET

TEST OF VARIETIES.—Seventeen varieties and strains of garden beets were tested in 1927, and of these, seven have been included in the tests for the past eleven years. Of these seven, the most satisfactory are Detroit Dark Red and Crosby Egyptian. Detroit Dark Red is a rapid-growing beet and very suitable for early bunching, or, if sown late, for winter storage. Crosby Egyptian is slower growing and smaller, but of a deeper colour and better quality.

Among the varieties that have been tested for a shorter period, a strain secured from the Division of Horticulture, Central Experimental Farm, Ottawa, known as Black Red Ball, 8694 is outstanding. The beets are very uniform, deep red in colour and of medium size.

DIFFERENT DATES OF SEEDING.—During the past five years, seed of Detroit Dark Red has been sown as early as the season will permit, and at intervals of about two weeks until the middle of July. So far it has been observed that beets of good bunching size will develop from seedings as late as the end of June.

GARDEN CARROT

TEST OF VARIETIES.—Nine varieties and strains of garden carrots were tested in 1927, and the best results were obtained with an Ottawa selection of Chantenay and Nantes Half Long. Varieties of carrots have been tested at this Station each year since 1915 and so far no variety has been tried that has given a better crop than Chantenay. As a second choice or for early bunching, Nantes Half Long is very satisfactory.

DIFFERENT DATES OF SEEDING.—The object of this project is to determine how late in the season carrot seed may be sown and carrots of bunching size

develop. Following is a five-year average of the results obtained from plots consisting of two thirty-foot rows each:—

GARDEN CARROTS—DIFFERENT DATES OF SEEDING—AVERAGE OF RESULTS, 1923 TO 1927

Seeding	Number of days until ready for use	Number of bunches of marketable size
Late April	96	30·3
Early May	92	36·1
Late May	90·3	32·9
Early June	99·7	26·7
Late June	103·0	23·7
*Early July	No crop 1923 to 1926	

*In 1927 the seeding made in early July produced a crop of 18 bunches.

SPINACH

TEST OF VARIETIES.—Excellent results were obtained with all of the eleven varieties of spinach tested in 1927. These included several novelties and specialties, but although they were somewhat different in season and nature of growth, none could be considered as superior to the well known varieties, Victoria and Long Standing. A late variety New Zealand has also given good results.

PEPPERS

TEST OF VARIETIES.—Both green and ripe sweet peppers sell readily on the local markets at good prices, most of the demand being supplied from outside the district. In general, very little trouble has been experienced at this Station in securing good yields of ripe peppers with several of the early varieties, and it is only reasonable to predict that gardeners in this district would have equal success if they made the attempt. The seed is planted in the hotbed early in April, the plants are pricked off when about an inch high and transplanted to the open when danger of frost is past, usually about June 8 or 9. As a rule ripe peppers are available by the middle of August. So far the most satisfactory varieties of those tested are Harris Early and Neapolitan. Another variety Squash or Tomato yields well and is quite early, but the peppers are a little too small for market. The variety should, however, prove excellent for home use.

Of the small hot peppers, Red Chili seems quite satisfactory.

LETTUCE

TEST OF VARIETIES.—Of the many varieties of lettuce that have been tested during the past twelve years, none of the loose leaf group have proven superior to Grand Rapids. In the cabbage-head group, the results have not been as striking, although there are several varieties apparently quite satisfactory. Of these Iceberg is the most commonly grown, and, although when grown in the open, the heads are a little small, they are quite compact and of excellent quality. Big Boston produces a very large compact head but during hot weather has scalded slightly. When sown late it should prove an excellent variety for sale or use during September. Salamander, another cabbage-head variety, is a little earlier than Iceberg, and produces heads of similar size and quality.

RADISH

TEST OF VARIETIES.—During the past twelve years, a large number of varieties of radish have been tested, but so far the best results have been obtained with French Breakfast XXX, Scarlet Oval and Scarlet Turnip White Tip.

PUMPKIN

TEST OF VARIETIES.—Good results were obtained with all of the seven varieties of pumpkins tested in 1927, all of which are apparently quite reliable for this district. The most satisfactory varieties are, however, Connecticut Field, for a large pumpkin, and of the small varieties, Sweet or Sugar. Quaker Pie is also an excellent small variety.

SQUASH

TEST OF VARIETIES.—Squash are a very dependable crop at Lennoxville and usually splendid yields are obtained. In 1927 twelve varieties were tested and of these ten have been grown for at least five years. Of this ten, the most satisfactory are Green Hubbard and Golden Hubbard. Warty Hubbard, which is apparently a strain of Green Hubbard, has also produced squash of excellent quality. Of the vegetable marrows Large White Bush may be recommended and of the crookneck sorts, a variety known as Crookneck has given the best results.

MUSKMELON

Muskmelons of good quality are readily saleable in this district and command high prices. Very few melons, however, are raised locally, the greater part of those consumed being imported. At this Station little difficulty has been experienced in securing good crops of melons and there is no reason why such experience could not be duplicated by gardeners throughout the district, providing the method of culture described in the reports from this Station for the years 1925 and 1926 is carefully followed.

TEST OF VARIETIES.—Of the large melons the best results have been obtained with Milwaukee Market and Montreal Market. The latter is somewhat larger but of slightly inferior quality than Milwaukee Market. Among the small varieties, Emerald Gem is decidedly the best that has been tested, with Paul Rose as a good second choice.

SWEET CORN

TEST OF VARIETIES.—Owing to the exceptionally favourable season all of the twenty-six varieties tested in 1927 produced well-developed ears fit for use. Such an experience is decidedly unusual and was due largely to the absence of the early fall frosts which usually occur at Lennoxville during early September, but in 1927, frost was not recorded until October 8. Accordingly, varieties that are normally too late for the season in this district, had ample time in which to mature and produced a normal crop. Usually only the earliest varieties are suitable in this district and of these the most satisfactory are Early Malcolm and Golden Bantam. Banting, a yellow variety originated at the Central Experimental Farm, is very early and produces a small cob with very deep kernels of excellent quality. Pickaninny, which is fairly well known in this district, is about the same season as Banting and very similar in size of ear, depth of kernel and quality. The kernels, however, when ready for use, are purple to nearly black in colour. This colour being unusual in this district, seems to be the chief reason

why Pickaninny corn has proven hard to dispose of on the local markets, as the yellow varieties sell much more readily. It is, however, an excellent variety for home use.

CUCUMBER

TEST OF VARIETIES.—Although eleven varieties were tested in 1927 and a total of twenty-one have been grown since 1915, no variety has been tried so far that is superior to Early Russian for an early sort or Davis Perfect for the main crop. For pickling the West Indian Gherkin is quite satisfactory.

For the past four years a frame cucumber, Rollins Telegraph, has been grown and excellent results obtained, some of the individual cucumbers having attained a length of thirty-four inches. The seed of this variety should be sown in the hotbed during April and the young plants moved to manured cold-frames during the latter part of May. At night and during cool days the lights should be kept on the frames until about the first of July. Frequent, but not excessive watering is necessary, up until the time when the lights are entirely removed. Usually the first well-developed cucumbers are available early in July, and, with reasonable attention, the vines bear until killed by frost.

TREE FRUITS

APPLES

VARIETY ORCHARD.—Owing to the extremely low temperatures, usually experienced during the winter months and the changeable weather during spring, the commercial production of apples is practically impossible at Lennoxville, and in a large portion of the district served by this Station. The object, therefore, of the variety orchard at this Station is primarily to determine the suitability of new varieties, to the prevailing climatic conditions, with a view to making recommendations for districts and situations where standard commercial varieties cannot be grown. During the past eleven years trees of sixty-one varieties of apples have been planted, and, in general, it has been found that none of the standard commercial varieties at present available, are sufficiently hardy for the conditions at this Station. There are, however, a number of new varieties, originated by the Dominion Horticulturist, that have proven hardy and bear apples of good quality. Those previously recommended are in order of season as follows:—Galetta, Melba, Joyce Lobo, Winton and Donald. Honora, another variety of which there are three healthy seven-year-old trees growing in the orchard, also seems quite hardy. It is a McIntosh seedling, originated at the Central Experimental Farm, somewhat similar in colour and size to its parent. Its flavour, however, is decidedly sweet. Holz, another variety originated at the Central Experimental Farm, fruited for the first time in 1927. The fruit is of medium size and very similar in colour, flavour and keeping quality to the well known Baldwin. As a winter variety it should prove very useful for districts where ordinary commercial varieties are not sufficiently hardy.

SMALL FRUITS

STRAWBERRIES

TEST OF VARIETIES.—The season of 1927 was very favourable for strawberries and an excellent crop was obtained, the average yield of twenty varieties included in the variety test, being 7,201 quarts per acre. The highest yield was obtained from a seedling of Wm. Belt, developed at this Station, which produced a crop of 11,011 quarts per acre. As mentioned, however, in a previous report from this Station, this variety, although high-yielding and

of excellent flavour and quality, is not firm enough for a good commercial variety. Its use, therefore, is limited to plantings for home use or local sale. Of other varieties that have been tested, the most satisfactory for either home use or commercial purposes are Senator Dunlap and Parson Beauty. Both of these varieties are well known and are readily obtainable from nurserymen.

RASPBERRIES

TEST OF VARIETIES.—As stated in the report from this Station for the year 1926, the disease known as Mosaic has become firmly established in the raspberry plantation at this Station for the testing of varieties. The first variety to become infected was Golden Queen in 1924. The following year, Cuthbert, Louboro and Newman 23 became badly diseased, while Newman 24 and Count showed a slight infection. Finally in 1927 all varieties except Herbert and Latham were so badly diseased that they were practically non-productive. Accordingly, the comparison of varieties was of value only as regards resistance to Mosaic. Of the two varieties which have shown marked resistance, Latham is the heaviest-yielding and apparently most suitable on heavy soils. Herbert is better adapted to light soil and is somewhat earlier.

Where disease free plants can be obtained and the plantation kept free from infection, Newman 23 is apparently the most satisfactory variety for commercial purposes. The berries are exceptionally firm and of good size. The variety also yields well and the canes are quite hardy. Its chief drawback is its susceptibility to Mosaic, but until more satisfactory varieties are available, it is recommended for commercial plantations.

CURRANTS AND GOOSEBERRIES

Owing to a severe infection of the European Currant Rust, a stage of the very destructive White Pine Blister Rust, all of the black currant bushes at this Station have been entirely defoliated early in August for the past three years. This continual early defoliation, although not actually killing the bushes, has materially lessened their vigor, and, for the past three years, the quality of the crop has decreased until in 1927 it was practically a failure. With gooseberries and red and white currants, the results of infection by this disease have not been as marked and normal crops have been obtained. The results obtained with these fruits were similar to those obtained in previous years and the same varieties are recommended namely:—

Red Currant: Red Grape and Victoria.
White Currant: White Cherry.
Gooseberries: Houghton, Carrie and Downing.

The results obtained up to 1925 with black currants indicate that Saunders, Kerry and Climax are the most satisfactory of the varieties tested.

ORNAMENTAL GARDENING

PERENNIALS

Owing to fairly frequent rainfall and the absence of extreme heat, the growing season at Lennoxville is very favourable for perennials. Invariably from the first bloom of Polyanthus in early May or late April, there is a continal display of brilliant bloom until severe frost, in late October, finally kills the flowers on the late varieties of perennial phlox. Although the extreme low temperatures, usually experienced during winter, and the changeable spring weather, prohibit the growing of many sorts, there are a large number of hardy species and varieties that have been found satisfactory. In the main perennial border, which is six hundred feet long and twelve feet wide, there are fifty-nine

varieties, representing twenty-six species, which have been grown with excellent results for at least five years. Practically every year this border has been flooded during fall or spring by the rising of the St. Francis river, and twice for periods of several days. Very little damage has resulted, however, and each year the various varieties have survived the extremely unfavourable condition, made normal growth and produced excellent bloom. Following is a table listing the most satisfactory species, of those that have been tested at his Station, together with notes on height, range of colour and average season.

Annual flower border started from seeding in the open at the Dominion Experimental Station, Lennoxville, Que.

RECOMMENDED HERBACEOUS PERENNIALS

Species	Height	Colour	Season of bloom	Remarks
Althaea rosea (Hollyhock)	5 ft. to 9 ft.	Many	July to Sept.	Several varieties.
Anchusa Barrelieri	2 ft. to 3 ft.	Blue	July and Aug.	
Aquilegia (Columbine)	1 ft. to 2½ ft.	Many	June and July	Many varieties.
Bellis perennis (English daisy)	5 in. to 7 in.	White and pink	July to Oct.	
Campanula pyramidalis	3 ft. to 5 ft.	Blue and white	July to Sept.	
Chrysanthemum coccineum (Pyrithrum)	1½ ft. to 2½ ft.	White to scarlet	June and July	Several varieties.
Chrysanthemum (Shasta daisy)	2 ft. to 3 ft.	White	July and Aug.	
Dianthus barbatus (Sweet William)	1½ ft. to 2 ft.	Varied and many	June to July	
Delphinium (Larkspur)	3 ft. to 6 ft.	Blue, red and white	June and July	Several varieties.
Dianthus plumarius (Garden pink)	1 ft. to 1½ ft.	White and pink	June and July	
Echinacea purpurea (Purplecone flower)	3 ft. to 4 ft.	Purple shades	Aug. and Sept.	
Gaillardia aristata	2 ft. to 3 ft.	Yellow to crimson	July to Sept.	Several varieties.
Helenium autumnale	5 ft. to 6 ft.	Yellow	July to Sept.	Several varieties.
Helianthus multiflorus	5 ft. to 7 ft.	Yellow	July to Sept.	Several varieties.
Iris (German)	1½ ft. to 2 ft.	Many	June	Many varieties.
Iris laevigata	2 ft. to 3 ft.	Many	June and July	Many varieties.
Lupinus polyphyllus	2 ft. to 3 ft.	White, pink and blue	June and July	Several varieties.
Lychnis chalcedonica (Jerusalem Cross)	2½ ft. to 3½ ft.	Crimson	July and Aug.	
Paeonia	2 ft. to 2½ ft.	Many	June and July	Many varieties.
Papaver orientale (Orientale poppy)	2 ft. to 3 ft.	Pink and scarlet	June	
Phlox paniculata	2 ft. to 3½ ft.	Many	Aug. to Oct.	Many varieties.
Phlox suffruticosa	2 ft. to 3½ ft.	Many	July to Sept.	Many varieties.
Primula farinosa (polyanthus)	7 in. to 10 in.	Many	May and June	Many varieties.
Veronica spicata (Summer sage)	2 ft. to 3 ft.	Blue	July and Aug.	

ANNUALS

SWEET PEA.—A total of thirty-seven varieties were grown in 1927. The seed was sown on April 25, and the first bloom was available on July 3. Most of the varieties grew to a height of six or seven feet and produced large quantities of flowers throughout the season, the last pickings being made on October 10. Of those tested the following ten varieties were the most satisfactory: King Mauve, Charity Crimson, Unwin, Felton Cream, Blue Bird, Floradale Purple, Supreme, Daffodil, Giant White and Grenadier.

GLADIOLI.—Of the sixty varieties grown in 1927, the following were the most satisfactory: Red Emperor, Schwaben, Orange Brilliant, Loveliness, Roem Van Kennemerland, Kundred, Marshal Foch, Mary Pickford, Pink Perfection, Purple Glory, Pink Wonder, Crimson Glory and Rose Glory.

DAHLIA.—A splendid collection of the best varieties of dahlia was grown during the past season, and although considerable damage was caused by the tarnished plant bug, the results on the whole were very satisfactory. A large portion of this collection was supplied by Dr. J. A. Cochrane of Lachine, Que., who is a noted dahlia grower and exhibitor. Following is a list of the twelve best varieties tested in 1927:—

Decorative: Jersey Beauty, El Dorado, Grizzly, Rosa Nell and Souv de Gust Doazon.

Paeony flowering: Gorgeous, Sadie C. and Billionaire.

Cactus: F. W. Fellows, Gladys Bates, El Granada and Gladys Sherwood.

MISCELLANEOUS ANNUALS.—In addition to sweet pea, gladioli and dahlia, approximately 150 varieties of annuals were raised from seedings in the hotbed and in the open garden, with, on the whole, excellent results.

CEREALS

OATS

Although variety tests of oats have been conducted at this Station each season since 1923, the work was expanded and partially reorganized in 1926. Accordingly, although five-year averages of results are available with a few varieties, the information is not complete in that hull determinations were not made previous to 1926, also fewer varieties were under test. The following table, therefore, is compiled from the results obtained from varieties tested during the past two seasons in duplicate one hundred and twentieth-acre plots:—

OATS—AVERAGE OF RESULTS, 1926 AND 1927

Variety	Number of days maturing	Strength of straw on scale of 10 points	Length of straw	Total yield of grain per acre	Yield of kernel per acre
			inches	bush.	lb.
Legacy, Ottawa 678	99·0	9·5	45·5	107·41	2,689
Banner, Langille	109·0	5·7	54·7	104·41	2,497
Banner, Griffin	107·5	6·7	50·7	93·44	2,381
Victory	109·0	8·7	52·5	93·47	2,231
Banner, Ottawa 49	112·0	8·1	52·5	91·26	2,227
Banner, Lennoxville	110·0	9·0	50·7	92·41	2,181
Gold Rain	103·0	9·4	50·2	88·62	2,161
O.A.C. No. 3	91·5	8·0	43·7	85·15	2,147
O 1512, Macdonald College	112·0	9·2	54·0	82·79	2,104
Alaska	94·0	8·2	39·5	78·35	2,081
Longfellow, Ottawa 478	101·5	6·9	50·5	87·00	2,034
Banner 44, Macdonald College	109·5	8·5	52·0	85·41	2,029
Banner, Dixon	110·5	8·0	56·0	75·44	2,028
Banner, Cap Rouge 31	110·0	8·3	51·6	81·88	2,002
O.A.C. 144	110·0	9·1	56·2	77·44	1,932
Daubeny	94·5	8·0	42·7	73·22	1,901
Laurel, Ottawa 478	109·0	9·5	46·0	Hulless	1,827
Danish Island Swedish	108·5	8·2	51·0	71·24	1,697

Legacy, Ottawa 678, one of the many varieties originated by the Cereal Division, Central Experimental Farm, Ottawa, has given decidedly promising results. It has now been grown at this Station for five years, and although other varieties have occasionally given higher yields of grain alone, they have proven less satisfactory in other respects. Legacy produces a fairly short, stiff straw seldom lodges, matures five to ten days earlier than Banner and the grain is, as a rule, comparatively thin-hulled. One acre of this variety grown along with the farm oat crop in 1927, under ordinary field conditions, gave a yield of 86·6 bushels. Under similar conditions the variety Banner produced 70·2 bushels. In dry seasons, when lodging is uncommon, Banner has proven equal to Legacy. However, in the average season, in this district, precipitation is ample for crop requirements and on fertile or low-lying land, tall-growing late oats lodge easily. Accordingly, for such sites, at least, Legacy would seem to be the best variety that has been tested at this Station.

BARLEY

As stated in previous reports from this Station, barley has consistently given higher yields of grain than oats, providing the crops are grown on soil in a good state of fertility and neither wet nor extremely heavy. In 1927 the average yield of nineteen varieties of oats was 2,765 pounds per acre, while fourteen varieties of barley averaged 2,900 pounds per acre, a difference of 135 pounds in favour of barley. From the standpoint of actual feed value, the difference is even greater as barley contains a much higher percentage of kernel than oats and is, therefore, a better feed pound for pound.

For the past two seasons fourteen varieties have been tested in duplicate one hundred and twentieth-acre plots.

In the following table an average of the results is shown:—

BARLEY—AVERAGE OF RESULTS, 1926 AND 1927

Variety	Kind	Number of days maturing	Height	Strength of straw on scale of 10 points	Yield per acre
			inches		bush.
Mensury, Macdonald College 3207	6-rowed	96·0	45·0	7·2	78·15
Gold (Swedish)	6-rowed	97·5	35·0	9·0	77·19
Chinese, Ottawa 60	6-rowed	95·5	46·3	9·0	74·50
Bearer, Ottawa 475	6-rowed	99·5	47·5	7·2	71·39
O.A.C. 21	6-rowed	96·0	44·0	9·0	69·44
Star	6-rowed	92·5	35·5	10·0	67·46
Manchurian, Cap Rouge 4	6-rowed	95·5	45·7	8·0	65·23
Charlottetown 80	2-rowed	98·0	30·5	7·7	61·88
Himalayan, Ottawa 59	Hulless	92·5	34·0	9·5	58·58
Duckbill, Macdonald College 207	2-rowed	103·0	45·0	9·5	55·71
Guymayle	Hulless	92·5	32·0	10·0	54·94
Hanchen	2-rowed	102·5	40·5	6·5	54·79
Feeder, Ottawa 61	Hooded	97·0	43·0	9·0	54·21
Duckbill, Ottawa 57	2-rowed	103·0	44·0	10·0	44·12

Of varieties that have been tested for five years, the best results have been obtained with those listed in the following table:—

BARLEY—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Kind	Number of days maturing	Height	Strength of straw on scale of 10 points	Yield per acre
			inches		bush.
Mensury, Macdonald College 3207	6-rowed	93·4	43·9	8·1	74·40
Chinese, Ottawa 60	6-rowed	93·4	47·1	7·9	72·73
O.A.C. 21	6-rowed	93·4	41·2	8·3	69·90
Charlottetown 80	2-rowed	99·8	40·2	8·2	68·35
Himalayan, Ottawa 59	Hulless	88·3	30·9	9·4	59·71
Duckbill, Ottawa 57	2-rowed	100·1	43·6	9·5	51·94

As may be noted from the foregoing tables, six-rowed varieties have given larger yields than two-rowed. The six-rowed group is also somewhat earlier and can usually be harvested early in August. Of the three varieties of the group listed in the statement of five-year averages, Mensury, Macdonald College 3207, has given the best yields and may be recommended over O.A.C. 21. Its superiority over Chinese, Ottawa 60, however, is slight and the difference in yield insufficient to warrant a definite recommendation.

In the two-rowed group decidedly the best results have been obtained with Charlottetown 80.

Himalayan, Ottawa 59, is a variety that, under some conditions, may be used to advantage as the grain being free from hull is of more value as a feed than the common barleys, and its actual value higher than indicated by the yields listed. The straw is very short and will not lodge easily. Accordingly, on land in a very high state of fertility, it will often given excellent results where other varieties would lodge badly.

Of the varieties which have been tested for two years only, Gold Sv., and Bearer, Ottawa 475, are the most promising.

SPRING WHEAT

The land used for the variety tests of spring wheat in 1927 was a fertile, low-lying heavy clay that had grown a crop of swede turnips the previous season. On this site the seed germinated well and the crop made excellent progress throughout the season, such varieties as Huron and Pringle's Champlain attaining a height of over five feet and yielding about forty bushels per acre. Following is a three-year average of the results obtained with the leading varieties tested in duplicate one hundred and twentieth-acre plots.

WHEAT—AVERAGE OF RESULTS, 1925 TO 1927

Variety	Number of days maturing	Height	Strength of straw on scale of 10 points	Yield per acre
		inches		bush.
Huron, Ottawa 3	107·6	43·3	9·3	38·17
Whiteheads, Charlottetown 123	110·3	45·8	9·3	36·83
Pringle's Champlain, Macdonald College 307	111·3	44·3	9·7	35·83
Huron, Cap Rouge 7	107·6	43·6	9·3	35·78
Marquis, Ottawa 15	108·0	45·6	10·0	34·90
Red Fife	101·7	48·6	9·4	34·08
Garnet, Ottawa 625	103·3	42·1	10·0	33·47
Early Red Fife, Ottawa 16	109·3	46·3	10·0	30·35
Ruby, Ottawa 623	103·0	43·3	10·0	29·93

Although differences in the yields of the various varieties are not great, Huron, Ottawa 3, has consistently produced larger crops of grain, and is apparently the most satisfactory variety for this district. During the past four years it has gradually replaced Red Fife and is now the most generally grown variety in the Eastern Townships. It is also probable that the superiority of Huron and its increased use has, in a measure, been responsible for the slight increase in the acreage of spring wheat, in this district, for the past two or three years.

FIELD PEAS

In general the cool moist climate of the Eastern Townships is ideal for the growing of field peas, but owing to the lateness of the crop, considerable difficulty is usually experienced in harvesting the pulled crop in good condition. As a result, although large yields are often obtained, the grain is frequently damaged by slow drying while the crop is bunched in the field, and although satisfactory for feeding, is unsuitable for seed. In this respect, the season of 1927 was slightly better than the average for the past five years, and most of the varieties were harvested in excellent condition. The yield of grain was also higher than usual, the average of eight varieties being 39.9 bushels per acre. Under ordinary field conditions a half-acre of O.A.C. 181 produced a total crop of 12.2 bushels, or 24.4 bushels per acre. Following is a statement showing the three-year average of the results obtained with six varieties:—

FIELD PEAS—AVERAGE OF RESULTS, 1925 TO 1927

Variety	Number of days maturing	Length of vine	Yield per acre
		inches	bush.
O.A.C. 181	107·0	62·0	37·25
Cartier, Ottawa 19	114·3	53·6	33·53
Arthur, Ottawa 18	108·3	50·6	33·13
Mackay, Ottawa 25	118·0	62·6	31·23
Chancellor, Ottawa 26	105·6	60·3	29·72
Prussian Blue	119·0	64·0	27·45

O.A.C. 181, has proven decidedly superior to all other varieties tested at this Station. It is quite early and produces a strong vigorous vine. The peas are of medium size and have proven quite satisfactory for cooking as well as for grinding for feed.

FIELD BEANS

As a rule very heavy yields of field beans are obtained at this Station, but in the average season, considerable injury is caused by Anthracnose and early fall frosts, resulting in a damaged, although large, crop. During the past two seasons, however, practically all varieties tested have ripened before frost, and Anthracnose, although in evidence, has caused very little injury. Accordingly, very large crops have been obtained, and the yields tabulated in the following statement, should not be considered as representative of those that may be expected in an average season under ordinary farm conditions, in the Eastern Townships:—

BEANS—AVERAGE OF RESULTS, 1925 TO 1927

Variety	Number of days maturing	Height of plant	Yield per acre
		inches	bush.
Red Kidney	116·6	15·6	45·50
Selected White, Lennoxville	117·0	16·0	36·33
Navy, Ottawa 711	109·0	12·6	35·95
Improved Yellow Eye	116·6	15·0	30·42
Robust	120·3	19·0	28·42
Norwegian, Ottawa 710	104·0	11·3	23·28
Large White, Ottawa 713	114·0	12·3	12·90

Although Red Kidney and Selected White, developed at this Station, have produced the largest crops, they are not as suitable for the district as Navy, Ottawa 711. Red Kidney is a large reddish Kidney bean, which although excellent for cooking, is not well known and will not sell readily. It is also quite late in maturing and in three seasons out of the past five, has been damaged by early fall frosts. Selected White, Lennoxville, is, as its name implies, a white bean of the navy type but, owing to its lateness, is not entirely satisfactory for this district. Navy, Ottawa 711, seems very well suited to the climatic peculiarities of the district and is also a high-yielding white bean of medium size and splendid cooking quality. It is decidedly the best variety of beans that has been tested at this Station. Improved Yellow Eye although a little late, is recommended as a second choice. On a favourable situation it will usually ripen before frost and under average conditions yields well. The variety is well known on the local markets and as a rule can be disposed of at a higher price than other varieties.

MIXED GRAIN

Although grain mixtures have been tested at this Station for the past four years, the project was extended in 1926 by the addition of a number of mixtures. In order therefore to show a comparison of all mixtures tested, the following table is compiled from the results obtained in the seasons of 1926 and 1927 only.

GRAIN MIXTURES—AVERAGE OF RESULTS, 1926 AND 1927

Variety and rate per acre			Number of days maturing	Height	Strength of straw on scale of 10 points	Per cent of crop	Yield per acre
				inches			lb.
Charlottetown 80	Barley	1 bush.	104·0	42·5	.....	41·7	.....
Banner, Ottawa 49	Oat	2 bush.	105·5	49·5	9·0	58·3	3,240
Duckbill, Ottawa 57	Barley	1 bush.	104·0	49·0	.....	25·8	.....
Banner, Ottawa 49	Oat	2 bush.	104·0	44·0	10·0	74·2	3,195
Duckbill, Ottawa 57	Barley	30 lb.	105·0	43·5	.....	16·7	.....
Huron, Ottawa 3	Wheat	25 lb.	107·5	49·0	.....	15·1	.....
Banner, Ottawa 49	Oat	45 lb.	104·0	48·5	.....	58·7	.....
Arthur	Pea	30 lb.	104·0	55·0	6·5	9·5	3,180
Charlottetown 80	Barley	1 bush.	103·5	41·5	.....	43·0	.....
Legacy	Oat	2 bush.	103·5	41·5	10·0	57·0	3,175
Banner, Ottawa 49	Oat	2 bush.	104·0	49·5	.....	89·7	.....
Arthur	Pea	½ bush.	104·0	57·0	9·5	10·3	3,135
Charlottetown 80	Barley	36 lb.	104·0	44·0	.....	30·2	.....
Ruby, Ottawa 623	Wheat	30 lb.	104·0	42·5	.....	10·8	.....
Banner, Ottawa 49	Oat	51 lb.	104·0	48·0	9·5	59·0	3,060
O.A.C. 21	Barley	1 bush.	96·0	46·0	.....	50·7	.....
Alaska	Oat	2 bush.	96·0	47·0	8·5	49·3	2,970
Charlottetown 80	Barley	36 lb.	104·5	42·5	.....	35·5	.....
Huron, Ottawa 3	Wheat	30 lb.	107·5	49·0	.....	17·4	.....
Banner, Ottawa 49	Oat	51 lb.	104·0	48·5	10·0	47·1	2,955
Duckbill, Ottawa 57	Barley	36 lb.	105·0	43·5	.....	23·4	.....
Huron, Ottawa 3	Wheat	30 lb.	107·5	49·0	.....	16·3	.....
Banner, Ottawa 49	Oat	51 lb.	104·0	48·5	10·0	60·4	2,850
Chinese, Ottawa 60	Barley	1 bush.	97·0	45·0	.....	33·1	.....
Banner, Ottawa 49	Oat	2 bush.	105·5	49·5	9·0	66·9	2,730
Chinese, Ottawa 60	Barley	1 bush.	96·0	46·0	.....	47·6	.....
Alaska	Oat	2 bush.	96·0	46·0	9·5	52·4	2,730
Duckbill, Ottawa 57	Barley	1½ bush.	105·0	44·0	.....	45·8	.....
Huron, Ottawa 3	Wheat	1 bush.	107·0	49·0	10·0	54·2	2,575
Chinese, Ottawa 60	Barley	1 bush.	96·0	45·5	.....	45·2	.....
Daubeny	Oat	2 bush.	96·0	45·5	10·0	54·8	2,537
Duckbill, Ottawa 57	Barley	1 bush.	106·0	41·5	.....	25·4	.....
O.A.C. 72	Oat	2 bush.	106·0	50·5	9·5	74·6	2,490
Duckbill, Ottawa 57	Barley	1 bush.	105·0	43·5	.....	52·3	.....
Huron, Ottawa 3	Wheat	½ bush.	107·5	49·0	.....	25·6	.....
Arthur	Pea	½ bush.	104·0	56·0	7·0	22·1	2,180

It will be observed that the best yield of grain has been obtained from the mixture composed of two bushels of Banner, Ottawa 49 oats and one bushel of Charlottetown 80, barley. Owing, however. to the difference in the length of the straw of the two species, this mixture as a crop is hard to handle and when cut and stooked, the barley heads being nearer the band dry more slowly than the oats. For this reason the mixture of Duckbill, Ottawa 57, and Banner, Ottawa 49, oats, although yielding slightly less, is more satisfactory and, under average Eastern Townships conditions, should give better results. Charlottetown 80 barley and Legacy, Ottawa 475, oats also make an excellent combination. The varieties are similar in height and number of days for

maturing and form nearly equal portions of the crop. The straw of both varieties is fairly stiff and the mixture should do well on situations where taller varieties would lodge easily.

If grain of higher feeding value is required, the mixture composed of Duckbill, Ottawa 57, barley, Huron, Ottawa 3, wheat, Banner, Ottawa 49, oats and Arthur pea, should prove satisfactory. Owing, however, to the presence of peas, this mixture is inclined to lodge, and on very fertile or low-lying land, would not be suitable.

Where earliness is an important factor, a mixture of Alaska oats and a good six-rowed barley, such as O.A.C. 21, is recommended.

FALL WHEAT

Although very little fall wheat is grown in the Eastern Townships, the results obtained at this Station during the past four years would indicate that a number of varieties are sufficiently hardy for the district and could be grown to advantage on favourable situations. In general the crop requires a fairly light, well-drained soil, in good mechanical condition and of fair fertility. It is also necessary to plant the seed sufficiently early in the fall that a growth of five or six inches is obtained before the ground freezes. At Lennoxville the most satisfactory time for seeding seems to be sometime during the first week in September. The yields obtained with the best varieties have compared favourably with those of spring wheat, and the crop has the advantage of being ready for harvest early in August, at which time good harvest weather is most likely to prevail. In the following table a four-year average is shown of the results obtained with the principal varieties tested in triplicate one hundred and twentieth acre plots:—

FALL WHEAT—AVERAGE OF RESULTS, 1924 TO 1927

Variety	Height	Strength of straw on scale of 10 points	Per cent stand	Yield per acre
	inches			bush.
Kharkov 1312 (Macdonald College)	39·0	10·0	85·4	37·07
Kanred	34·2	9·8	85·3	32·23
O.A.C. 104	44·3	9·9	80·0	29·73
Dawson's Golden Chaff	42·5	10·0	79·2	29·48
Kharkov 112 (Macdonald College)	39·2	10·0	79·2	24·98
Kharkov 2212 (Macdonald College)	36·5	10·0	79·9	22·95

FALL RYE

For the past four years excellent results have been obtained with fall rye. The crop has proven somewhat hardier than fall wheat and as a result more productive. In 1927 the average yield of three one hundredth acre plots of the variety Dakold was 54.43 bushels per acre. The four-year average yield of this variety is also high, being 47.26 bushels per acre.

FORAGE CROPS

ENSILAGE CORN

In the comparatively cool moist climate of the Eastern portion of the district served by this Station, ensilage corn is in general an uncertain crop. Apparently the handicap of unfavourable climatic conditions can be overcome only where soil conditions are ideal. Accordingly, on light well-drained soils, in a high state of fertility or on fertile bottom land bordering rivers, good crops are usually obtained. On the average farm land, however, good yields of corn are decidedly rare and other crops will usually give better results. In the western counties of the district, climatic conditions are more favourable and good crops of corn are usually obtained, under proper cultural practice, on practically all types of good farm land.

At this Station, which is typical of the eastern portion of the district, good crops of ensilage corn are rarely obtained except on light, well-drained soil in a high state of fertility. Under such favourable conditions heavy yields of green material have been obtained, but, owing to immaturity, the dry-matter content has been relatively low and the actual value of the crop less than the yield of forage would indicate.

During the season of 1927, nineteen varieties of ensilage corn were tested in quadruplicate plots. Following are the results obtained:—

ENSILAGE CORN—TEST OF VARIETIES, 1927

Variety	Source	Height of plant		Stage of maturity	Yield per acre			
					Green weight		Dry matter	
		ft.	in.		tons	lb.	tons	lb.
Burr Leaming	Geo. S. Carter	8	9	Tasselled	28	460	3	902
Twichell's Pride	Exp. Sta., Fredericton	6	7	Milk	20	1,640	3	68
Longfellow	J. O. Duke	8	4	Kernel formed	24	320	2	1,932
Wisconsin No. 7	Parks	8	4	Tasselled	27	480	2	1,906
Bailey	J. O. Duke	8	1	Silked	20	1,440	2	1,586
Hybrid	Wimple	8	3	Silked	21	1,120	2	1,440
Compton's Early	J. O. Duke	7	12	Silked	22	1,733	2	1,430
Quebec 28	Macdonald College	6	6	Late milk	18	1,500	2	1,406
North Western Dent	Macdonald College	7	2	Silked	18	1,040	2	1,318
Minnesota No. 13	A. E. McKenzie	7	11	Silked	19	1,600	2	1,226
North Dakota	Steele-Briggs	7	2	Kernel formed	20	260	2	1,222
White Cap Yellow Dent	Steele-Briggs	8	0	Silked	19	1,920	2	1,100
Red Cob	Steele-Briggs	7	11	Tasselled	23	560	2	944
North Western Dent	Exp. Farm, Brandon	6	2	Kernel formed	15	800	2	880
Yellow Dent	Wimple	8	0	Silked	18	1,380	2	820
Golden Glow	J. O. Duke	8	5	Kernel formed	18	1,200	2	758
Leaming	Parks	8	5	Kernel formed	18	580	2	738
Gehu	Dakota Imp. Seed Co.	5	3	Milk	11	1,960	2	614
Amber Flint	Wimple	6	7	Kernel formed	17	620	2	274
Average					20	644	2	1,292

Of the varieties listed in the foregoing table, ten have been included in the tests since 1923. In the following table the average results obtained with these varieties from 1923 to 1927 is shown:—

ENSILAGE CORN—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Source	Height	Yield per acre	
			Green weight	Dry matter
		ft. in.	tons lb.	tons lb.
Twichell's Pride	Exp. Station, Fredericton	6 3	18 1,297	3 1,075
Compton's Early	J. O. Duke	7 10	23 1,720	3 1,044
North Western Dent	Macdonald College	8 0	19 810	3 970
Wisconsin No. 7	Parks	9 1	21 394	3 852
Golden Glow	J. O. Duke	8 6	21 590	3 588
Longfellow	J. O. Duke	8 2	22 1,504	3 561
Leaming	Parks	8 8	20 1,270	3 546
North Dakota	Steele-Briggs	7 6	19 1,448	3 145
Quebec 28	Macdonald College	6 7	17 1,660	3 97
White Cap Yellow Dent	Steele-Briggs	7 10	18 1,687	3 17

Twichell's Pride and Compton's Early are both varieties of the flint group and have proven the most dependable of all varieties tested at this Station. North Western Dent, from Macdonald College, is a fairly early maturing Dent variety that has also proven quite satisfactory. Either of these three varieties may be recommended for that portion of the district east of the St. Francis river. For the western counties the later and taller-growing Dent varieties, such as Wisconsin No. 7, Golden Glow and Leaming, are more likely to prove satisfactory.

GRAIN MIXTURES FOR ENSILAGE

During the past four or five years mixtures of grain, usually oats, peas and vetch, have been gradually replacing corn and sunflowers as an ensilage crop in the Eastern Townships. In some respects such mixtures are very desirable. In general they are more suitable for the soil and climatic peculiarities of the district than corn and are accordingly a more dependable crop. They also require less labour during the growing period than either corn or sunflowers, and have proven an excellent nurse crop for seeding to grasses and clover. From the standpoint of production, there is little to choose between the three crops, for although the yield of green forage from grain mixtures is comparatively low, the dry matter content is relatively high. The production per acre of dry matter, or material of value for feeding is, therefore, about equal to a good crop of corn produced in this district. To illustrate this point, the accompanying table shows the average green weight, per cent dry-matter and dry matter per acre of all grain mixtures, and varieties of corn and sunflowers tested in 1927.

COMPARISON OF CROPS FOR ENSILAGE, 1927

Kind of crop	Number of varieties of mixtures	Per cent dry matter	Average yield per acre	
			Green weight	Dry matter
			tons lb.	tons lb.
Sunflowers	3	11·71	26 1,666	3 284
Grain mixtures	17	23·99	12 888	2 1,971
Corn	19	13·02	20 664	2 1,292

Further reference to this subject may be found in the section of this report dealing with Field Husbandry, under the heading " Yields and Costs of Root and Silage Crops."

During the past season eighteen different mixtures were grown in duplicate plots of one hundred and fiftieth acre each. Following is a statement of the results obtained:—

GRAIN MIXTURES FOR ENSILAGE, 1927

No.	Mixture and seed per acre		Stage when cut	Per cent of each variety in forage	Yield per acre			
					Green weight		Dry matter	
					tons	lb.	tons	lb.
18	Millet	9 lb.		0·00				
	Feeder Barley	1 bush.	Dough	79·01	10	100	3	1,210
	Golden Vine Pea	40 lb.	Bloom to dough	14·18				
	Vetch	15 lb.	Pods formed	6·81				
3	Banner Oat	2 bush.	Dough	61·56	14	1,500	3	912
	Golden Vine Pea	1 bush.	Early dough	38·44				
4	Banner Oat	2 bush.	Dough	84·53	15	1,200	3	742
	Mackay Pea	1 bush.	Early dough	15·47				
9	Gold Rain Oat	2 bush.	Dough	78·26				
	Chancellor Pea	½ bush.	Dough	20·70	12	100	3	670
	Vetch	¼ bush.	Bloom to pod formed	1·04				
8	Laurel Oat	2 bush.	Advanced dough	74·43				
	Chancellor Pea	½ bush.	Dough	18·05	12	200	3	500
	Vetch	¼ bush.	Bloom to pod formed	7·52				
5	Banner Oat	2 bush.	Dough	78·05	14	800	3	480
	Alaska Pea	1 bush.	Ripening	21·95				
1	Banner Oat	2 bush.	Dough	86·25	11	1,400	3	419
	Chancellor Pea	½ bush.	Dough	13·75				
2	Banner Oat	2 bush.	Dough	85·94	12	1,400	3	269
	Arthur Pea	1 bush.	Early dough	14·06				
12	Spring Rye	90 lb.	Dough	79·16				
	Chancellor Pea	½ bush.	Dough	13·01	10	1,600	3	20
	Vetch	¼ bush.	Pods formed	7·83				
6	Banner Oat	2 bush.	Dough	74·14				
	Chancellor Pea	½ bush.	Dough	20·63	14	700	3	7
	Vetch	¼ bush.	Bloom to pod formed	5·23				
7	Victory Oat	2 bush.	Dough	84·17				
	Chancellor Pea	½ bush.	Dough	10·64	14	500	2	1,751
	Vetch	¼ bush.	Bloom to pod formed	5·19				
13	Banner Oat	1½ bush.	Dough	61·77				
	Spring Rye	30 lb.	Nearly ripe	31·51	9	300	2	1,627
	Chancellor Pea	½ bush.	Dough	2·56				
	Vetch	¼ bush.	Pod formed to dough	4·16				
17	Millet	9 lb.	Not headed	3·46				
	Golden Vine Pea	40 lb.	Early dough	22·50	9	1,300	2	1,547
	Banner Oat	1 bush.	Early dough	62·12				
	Vetch	¼ bush.	Pod formed to dough	11·92				
15	Banner Oat	1 bush.	Early dough	39·00				
	Feeder Barley	1 bush.	Dough	42·81	10	1,900	2	1,447
	Golden Vine Pea	40 lb.	Bloom to dough	12·85				
	Vetch	¼ bush.	Pods formed	5·34				
16	Millet	18 lb.	Not headed	24·28				
	Golden Vine Pea	40 lb.	Bloom to dough	57·51	10	400	2	1,290
	Vetch	15 lb.	Bloom to pod formed	18·21				
11	Spring Rye	90 lb.	Dough	75·15	9	100	2	1,090
	Chancellor Pea	45 lb.	Dough	24·85				
14	Feeder Barley	1 bush.	Dough	65·57				
	Golden Vine Pea	40 lb.	Blossom to dough	23·75	11	400	2	1,024
	Vetch	¼ bush.	Pods formed	10·68				
10	Longfellow Oat	2 bush.	Advanced dough	77·93				
	Chancellor Pea	½ bush.	Dough	20·66	8	1,200	2	470
	Vetch	¼ bush.	Bloom to pod formed	1·41				
	Average				12	888	2	1,971

Of the mixtures listed in the foregoing table, a number have been tested for the past three years. The following table shows the average results that have been obtained with ten that have given the best results during that period.

GRAIN MIXTURES FOR ENSILAGE—AVERAGE OF RESULTS, 1925 TO 1927

No.	Mixture and seed per acre			Yield per acre			
				Green weight		Dry matter	
				tons	lb.	tons	lb.
9	Gold Rain	Oat	2 bush.	11	1,500	3	1,711
	Chancellor	Pea	½ bush.				
	Vetch		¼ bush.				
8	Laurel	Oat	2 bush.	10	1,597	3	1,343
	Chancellor	Pea	½ bush.				
	Vetch		¼ bush.				
7	Victory	Oat	2 bush.	12	650	3	1.058
	Chancellor	Pea	½ bush.				
	Vetch		¼ bush.				
13	Banner	Oat	1½ bush.	9	1,420	3	917
	Spring Rye		½ bush.				
	Chancellor	Pea	½ bush.				
	Vetch		¼ bush.				
3	Banner	Oat	2 bush.	11	580	3	858
	Golden Vine	Pea	1 bush.				
4	Banner	Oat	2 bush.	11	1,165	3	319
	Mackay	Pea	1 bush.				
1	Banner	Oat	2 bush.	10	500	3	170
	Chancellor	Pea	1 bush.				
2	Banner	Oat	2 bush.	10	797	3	158
	Arthur	Pea	1 bush.				
12	Spring Rye		1½ bush.	9	290	3	85
	Chancellor	Pea	½ bush.				
	Vetch		¼ bush.				
6	Banner	Oat	2 bush.	11	280	3	82
	Chancellor	Pea	½ bush.				
	Vetch		¼ bush.				

From the information obtained during the past three years, it would seem that the value of a grain mixture for ensilage is governed more by its tendency to lodge than by its actual yield. When the crop is lodged badly, pea and vetch vines rot quickly and if much of the crop is in this condition, it will make an unpalatable ensilage of poor quality and disagreeable odour. Accordingly, mixtures that will remain standing until most of the crop is in the dough stage, and, at the same time produce good yields, are the most desirable. In this respect mixtures Nos. 9 and 13, containing Gold Rain oat and spring rye respectively, have proven very satisfactory. All the other mixtures listed in the table of three-year averages, excepting No. 12, which contains spring rye, have lodged while immature.

In 1927, as may be noted from the table of one year's results, the introduction of millet into the mixture for the purpose of holding the crop up, was not successful, as it made very little growth and formed a very small percentage of the crop. In mixture No. 18 only a trace of millet could be found in the crop. but in mixture No. 16, where it replaced oats entirely it grew slowly and formed 24·28 per cent of the crop. In mixture No. 9, where Gold Rain oat was used with the same variety of peas and vetch, it formed 78·26 per cent of the crop.

For the past two years Feeder barley has been tried in mixtures and in general the results have been quite favourable.

It has been observed that although vetch is commonly used in such mixtures, it actually forms a very small percentage of the total crop. Referring to the table of one year's results, it may be noted that the percentage it has formed of the crop, when grown with peas and oats, ranges from 1·04 to 7·83. In view of the high cost of the seed of this species, it is doubtful if its use is advisable.

SUNFLOWERS

On the fairly heavy, yet fertile soil, characteristic of much of the Eastern Townships, sunflowers will, in the average season, produce larger crops than corn. At this Station, the crop has now been grown for eight years on all available types of soil and not once has a total or even partial crop failure occurred, yet in spite of its sureness and adaptability to soil and climatic variations, the area annually planted to sunflowers in the Eastern Townships, is increasing very slowly. As a rule farmers do not like the crop as it is more difficult to handle than either corn or grain mixtures, grown for ensilage, and the ensilage is less palatable. The crop is also occasionally damaged by the attack of the larva of the Peacock fly. On the other hand large yields may be obtained with this crop, and, as indicated in the Field Husbandry section of this report, a ton of dry matter can be secured at less cost with sunflowers than with other succulent roughages. Following are the average results that have been obtained with three varieties that have been tested for the past five years:—

SUNFLOWERS—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Source	Height		Yield per acre			
				Green weight		Dry matter	
		ft.	in.	tons	lb.	tons	lb.
Mammoth Russian	A. E. Fish	8	5	25	1,543	3	1,572
Giant Russian	Dakota Imp. Seed Co.	8	1	23	557	3	1,256
Ottawa 76	Exp. Farm, Ottawa	6	8	14	123	2	613

As indicated in previous reports, the Mammoth Russian variety has given the best results. It is a very tall, strong-growing variety and to facilitate handling, should be planted thickly. Seed of this variety is handled by practically all seedsmen in Eastern Canada.

SWEDE TURNIPS

The variety test of swede turnips for 1927 included practically all of the principal varieties commonly grown in Canada and a few obtained from foreign sources. The seed was sown on well prepared ground on May 10 and 11, but owing to poor germination and injury by the turnip fly, the whole experiment was reseeded on June 8 and 9. With this second seeding an excellent stand was obtained, but owing to its lateness the crop was somewhat lighter than usual. Following are the average results obtained from quadruplicate plots of each variety:—

SWEDE TURNIPS—TEST OF VARIETIES, 1927

Variety	Source	General type and colour	Yield per acre			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Ditmars	Lennoxville	Bronze Top, Globe.	31	1,030	2	998
Ditmars	McNutt	Bronze Top, Globe.	32	1,076	2	761
Hall's Westbury	Ewing	Purple Top, Globe..	27	824	2	759
White Swede	Bruce	Green Top, Globe..	29	80	2	583
Invicta Bronze Top	Ewing	Bronze Top, Globe..	26	316	2	554
Model	Garton	Bronze Top, Globe..	28	1,882	2	475
Extra Improved	Drummond	Purple Top, Oval...	24	1,214	2	418
Favorite	Dupuy & Ferguson..	Purple Top, Globe..	27	428	2	380
Improved Yellow Swedish	General Swedish...	Bronze Top, Globe..	25	182	2	374
Perfection	Dupuy & Ferguson..	Bronze Top, Globe..	26	1,262	2	360
Danish Queen	Macdonald College.	Purple Top, Globe..	25	930	2	259
Canadian Gem	Bruce	Purple Top, Globe..	26	1,174	2	231
New Swede Empire	Webb	Bronze Top, Globe.	25	1,854	2	176
Magnum Bonum	Bruce	Purple Top, Globe..	25	666	2	92
Elephant or Monarch	Bruce	Purple Top, Globe..	25	1,942	2	88
Bangholm	Kentville	Purple Top, Globe..	22	1,474	2	68
Bangholm	General Swedish..	Purple Top, Globe..	23	1,982	2	22
Improved Lathian	Drummond	Purple Top, Globe..	25	446	2	11
Bangholm	Charlottetown	Purple Top, Globe..	24	532	2	0
Imperial	Webb	Purple Top, Globe..	24	444	1	1,989
Breadstone Green Top	McKenzie	Slight Bronze Top, Globe	20	414	1	1,969
Bangholm 8112	Macdonald College.	Purple Top, Globe..	27	582	1	1,964
Sutton's Champion Purple Top	Ewing	Purple Top, Globe..	23	1,366	1	1,951
Mammoth Clyde Purple Top	Ewing	Purple Top, Globe..	25	1,436	1	1,947
Improved Lord Derby	Sutton	Bronze Top, Globe..	25	1,172	1	1,934
Giant King	Webb	Purple Top, Globe..	22	1,452	1	1,916
New Buffalo	Webb	Purple Top, Globe..	25	1,502	1	1,890
Bangholm	Nappan	Purple Top, Globe..	23	464	1	1,876
Magnum Bonum	Ewing	Purple Top, Globe..	21	1,208	1	1,817
Mammoth Clyde Purple Top	Dupuy & Ferguson..	Purple Top, Globe..	23	464	1	1,813
Magnificent Swede	Garton	Purple Top, Globe..	26	1,592	1	1,808
Derby Green Top	Bruce	Bronze Top, Tankard	25	226	1	1,806
Elephant or Monarch	McKenzie	Purple Top, Globe..	22	1,474	1	1,804
Giant King	Bruce	Purple Top, Globe..	26	1,856	1	1,788
Kangaroo	Dupuy & Ferguson..	Bronze Top, Tankard	24	708	1	1,786
Kangaroo	Ewing	Bronze Top, Oval...	21	1,670	1	1,766
Sterling Castle	Drummond	Bronze Top, Oval...	22	1,166	1	1,758
Early Six Weeks	Sutton	Green Top, Oval....	32	1,934	1	1,733
Ne Plus Ultra	Dupuy & Ferguson..	Bronze Top, Globe..	26	492	1	1,725
New Balmoral	Webb	Purple Top, Globe..	23	574	1	1,714
Canadian Gem	Steele-Briggs	Bronze Top, Globe..	22	418	1	1,659
North Western	McKenzie	Purple Top, Globe..	22	1,826	1	1,650
Kangaroo	Steele-Briggs	Bronze Top, Tankard	23	816	1	1,621
Keepwell	Garton	Bronze Top, Globe..	23	24	1	1,621
Hazard's Improved	Steele-Briggs	Bronze Top, Tankard	22	1,738	1	1,599
Garton's Superlative	Ewing	Purple Top, Globe..	23	1,894	1	1,590
New Swede Masterpiece	Webb	Purple Top, Oval...	25	1,634	1	1,579
New Universal Purple Top	Dupuy & Ferguson..	Purple Top, Globe..	22	550	1	1,542
Champion	Sutton	Purple Top, Globe..	22	1,628	1	1,540
Viking King	Garton	Bronze Top, Globe..	22	1,694	1	1,535
Acquisition	Sutton	Purple Top, Globe..	23	134	1	1,496
Superlative	McKenzie	Purple Top, Globe..	25	182	1	1,483
Good Luck	Steele-Briggs	Purple Top, Globe..	22	1,452	1	1,483
Garton's Superlative	Garton	Purple Top, Globe..	22	1,760	1	1,472
Hartley's Bronze Top	Bruce	Bronze Top, Globe..	21	526	1	1,346
Laing's Purple Top	Ewing	Bronze Top, Globe..	17	1,112	1	1,183
Laing's Improved	Dupuy & Ferguson..	Bronze Top, Globe..	19	742	1	1,137
Average			24	1,292	1	1,911

Of a large number of varieties that have been tested during the past five years, the best results have been obtained with those listed in the following table:—

SWEDE TURNIPS—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Source	General type and colour	Yield per acre			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Ditmars	McNutt	Bronze Top, Globe	32	707	3	368
White Swede	Bruce	Green Top, Globe	28	1,694	3	148
Magnum Bonum	Ewing	Purple Top, Globe	26	1,180	2	1,909
Canadian Gem	Bruce	Purple Top, Globe	26	1,383	2	1,506
Hall's Westbury	Ewing	Purple Top, Globe	28	1,785	2	1,305
Magnum Bonum	Bruce	Purple Top, Globe	28	377	2	1,295
Garton's Superlative	Ewing	Purple Top, Globe	28	316	2	1,271
Hartley's Bronze Top	Bruce	Bronze Top, Globe	23	1,541	2	1,207
Elephant or Monarch	Bruce	Purple Top, Globe	26	1,266	2	1,174
Invicta Bronze Top	Ewing	Bronze Top, Globe	27	135	2	939
Mammoth Clyde	Ewing	Purple Top, Globe	26	584	2	740
Sutton's Champion	Ewing	Purple Top, Globe	21	1,699	2	691
Kangaroo	Ewing	Bronze Top, Oval	25	806	2	546
Average			26	1,959	2	1,315

Although its superiority in yield, on a five-year average, over other varieties is not great, the variety Ditmars has proven very satisfactory in all respects. The roots are smooth and uniform, characteristically globe in shape, and less inclined to produce long necks and coarse tops on fertile soil than most varieties. They keep well in storage and their dry matter content is fairly high. As a second choice Canadian Gem and Magnum Bonum have proven more satisfactory than White Swede which, although having produced high yields, cracks badly when grown on fertile soil at this Station, and has not kept well in storage.

MANGELS

TEST OF VARIETIES.—Twenty-eight varieties of mangels were tested in 1927 in quadruplicate plots. Following are the results obtained:—

MANGELS—TEST OF VARIETIES, 1927

Variety	Source	General type and colour	Yield per acre			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Long Red Mammoth	Ewing	Long, Red	36	1,180	3	386
Rosted Barres	Hartman	Orange, Intermediate	34	1,720	3	30
Sludstrup Barres	Hartman	Yellow, Intermediate	33	1,180	3	28
Giant Rose Intermediate	Ewing	Rose Pink, Intermediate	27	1,580	2	1,966
Red Top Half Sugar	Hartman	Rose Pink, Intermediate	37	1,280	2	1,882
Danish Sludstrup	Macdonald	Orange, Intermediate	32	880	2	1,808
Danish Sludstrup	Ewing	Orange, Intermediate	30	1,820	2	1,705
Stryno Barres	Hartman	Yellow, Intermediate	34	600	2	1,588
Giant White Half Sugar	Ewing	White, Intermediate	29	200	2	1,462
Green Top Half Sugar	Hartman	White, Intermediate	28	1,380	2	1,387
Barres Oval	General Swedish	Yellow Intermediate	29	1,580	2	1,326
Barres Half Long	General Swedish	Yellow, Intermediate	26	60	2	1,307
Red Intermediate	Ewing	Red, Intermediate	31	1,540	2	1,236
Sludstrup	Penticton	Yellow, Intermediate	27	1,880	2	1,182
Yellow Intermediate	Ottawa	Orange, Intermediate	28	420	2	957
Eckendorffer Red Tankard	General Swedish	Red, Tankard	31	1,520	2	874
Elvetham Mammoth	Hartman	Long, Red	24	1,840	2	817
Eckendorffer Yellow Tankard	Hartman	Orange, Tankard	13	140	2	764
Fjerritslev Barres	Hartman	Yellow, Intermediate	29	840	2	708
Svalof Original Alpha	General Swedish	White, Intermediate	25	820	2	696
Eclipse	McKenzie	Yellow, Tankard	30	1,980	2	678
Red Globe	Ewing	Red, Globe	26	1,880	2	662
Yellow Eckendorffer	General Swedish	Orange, Tankard	30	1,360	2	613
Golden Tankard	Ewing	Orange, Tankard	24	80	2	570
Giant Yellow Intermediate	Ewing	Orange, Intermediate	24	1,020	2	474
Red Eckendorffer	Hartman	Red, Tankard	30	1,900	2	419
Yellow Vauriac	Vilmorin	Orange, Intermediate	27	1,440	2	416
Giant Yellow Globe	Ewing	Yellow, Globe	30	380	2	286
Average			29	589	2	1,151

Of the varieties listed in the foregoing table twenty-one have been included in the tests for the past five years. Of these the highest yielding are listed in the following table:—

MANGELS—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Source	General type and colour	Yield per acre			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Yellow, Intermediate	Ottawa	Orange, Intermediate	31	857	3	1,183
Giant Rose Intermediate	Ewing	Rose Pink, Intermediate	27	791	3	946
Danish Sludstrup	Macdonald	Orange, Intermediate	34	676	3	557
Danish Sludstrup	Ewing	Orange, Intermediate	27	1,694	3	58
Long Red Mammoth	Ewing	Long, Red	27	485	2	1,757
Red Globe	Ewing	Red, Globe	26	662	2	994
Giant Yellow Globe	Ewing	Yellow, Globe	27	312	2	548
Giant Yellow Intermediate	Ewing	Orange, Intermediate	24	1,226	2	490
Golden Tankard	Ewing	Orange, Tankard	22	740	2	460
Average			27	1,271	2	1,666

As stated in previous reports from this Station, the Yellow Intermediate variety obtained from Ottawa, has proven the most satisfactory variety tested. In general it has been found that roots of the intermediate type are more satisfactory to handle, and also give the largest yields. Giant Rose Inter-

mediate, which has produced the second largest average yield for the past five years, is of this type. It is also a fairly uniform variety and of good keeping quality.

FIELD CARROTS

Of the varieties of field carrots that have been tested for five or more years, those listed in the following table have given the best results:—

FIELD CARROTS—AVERAGE OF RESULTS, 1923 TO 1927

Variety	Source	General type and colour	Yield per acre			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Improved Intermediate White	Ewing	White, Intermediate	23	1,923	2	551
Mammoth Intermediate White	Bruce	White, Intermediate	23	848	2	415
White Belgian	Bruce	White, Long	20	1,661	2	245
Yellow Belgian	Ewing	Yellow, Intermediate	19	1,760	2	33
White Belgian	Ewing	White, Long	20	779	1	1,886
Danish Champion	Exp. Farm, Ottawa	Yellow, Intermediate	18	1,603	1	1,774
New Yellow Intermediate	Ewing	Yellow, Intermediate	20	747	1	1,761
Long Orange Belgian	Bruce	Orange Long	17	680	1	1,619
White Belgian	Dupuy & Ferguson	White, Long	18	820	1	1,569
Long Orange	Bruce	Orange, Long	14	1,667	1	632
Average			19	1,649	1	1,848

In general it has been found that carrots of the intermediate type are on the whole the most satisfactory, as they usually yield well and the roots are easier to handle than those of the "long" type. Accordingly, Improved Intermediate White and Mammoth Intermediate White, although but slightly higher-yielding in dry matter per acre than Long Orange, are, when type of root is taken into consideration, decidedly superior. Seed of both varieties is easily obtainable from Canadian seed houses.

FACTORY SUGAR BEETS

The work with factory sugar beets in 1927 consisted of the testing of four lots, the seed of which was obtained from different houses. The results obtained were similar to those of former seasons in that good yields were secured, and the beets were of good quality and high sugar content. Following is a statement of the results obtained.

FACTORY SUGAR BEETS—TEST OF VARIETIES

Variety or source of seed	Yield per acre	Sugar in juice	Co-efficient of purity
	tons	p.c.	p.c.
Horning	18·7	18·18	89·82
Home grown	17·3	18·20	91·26
Dippe	17·3	18·32	89·60
Schreiber Bros. & Sons	16·8	19·25	91·45

ALFALFA

Although it has proved difficult to secure a good stand of alfalfa at this Station, it has been found that good stands winter satisfactorily and produce excellent crops of hay. In general the results of trials conducted annually since 1916 have indicated that success with alfalfa may be obtained only on well-drained, permeable soils in a high state of fertility, and alkaline in reaction. Furthermore, even under such favourable conditions, the crop starts slowly and rarely survives the first winter when seeded with a nurse crop.

In an experiment begun in 1926, Variegated alfalfa was seeded with and without a nurse crop on land receiving different applications of limestone in conjunction with manure and commercial fertilizer. The land used for the experiment was a fairly stiff clay loam with a very firm subsoil. In general the crop wintered fairly well on all plots, but the growth in 1927 was poor and the results obtained conflicting. Two light cuttings were obtained and a fairly heavy third growth was allowed to remain standing for winter protection. A similar experiment was started in 1927, on light well-drained land with a gravel subsoil.

POULTRY

The seasonal conditions of 1927 were very favourable for poultry work throughout this section of the province. The winter months were more moderate in temperature than has been the case for some years, and an early spring provided more favourable conditions to secure good hatching results from the breeding stock. The summer months were not exceptionally hot, allowing the young stock a fine chance to develop, and the autumn, although dull and damp, did not register any severe cold weather. Better developed young stock were to be seen on most of the farms in this part of the Eastern Townships than there has been since inspection was commenced by this Station.

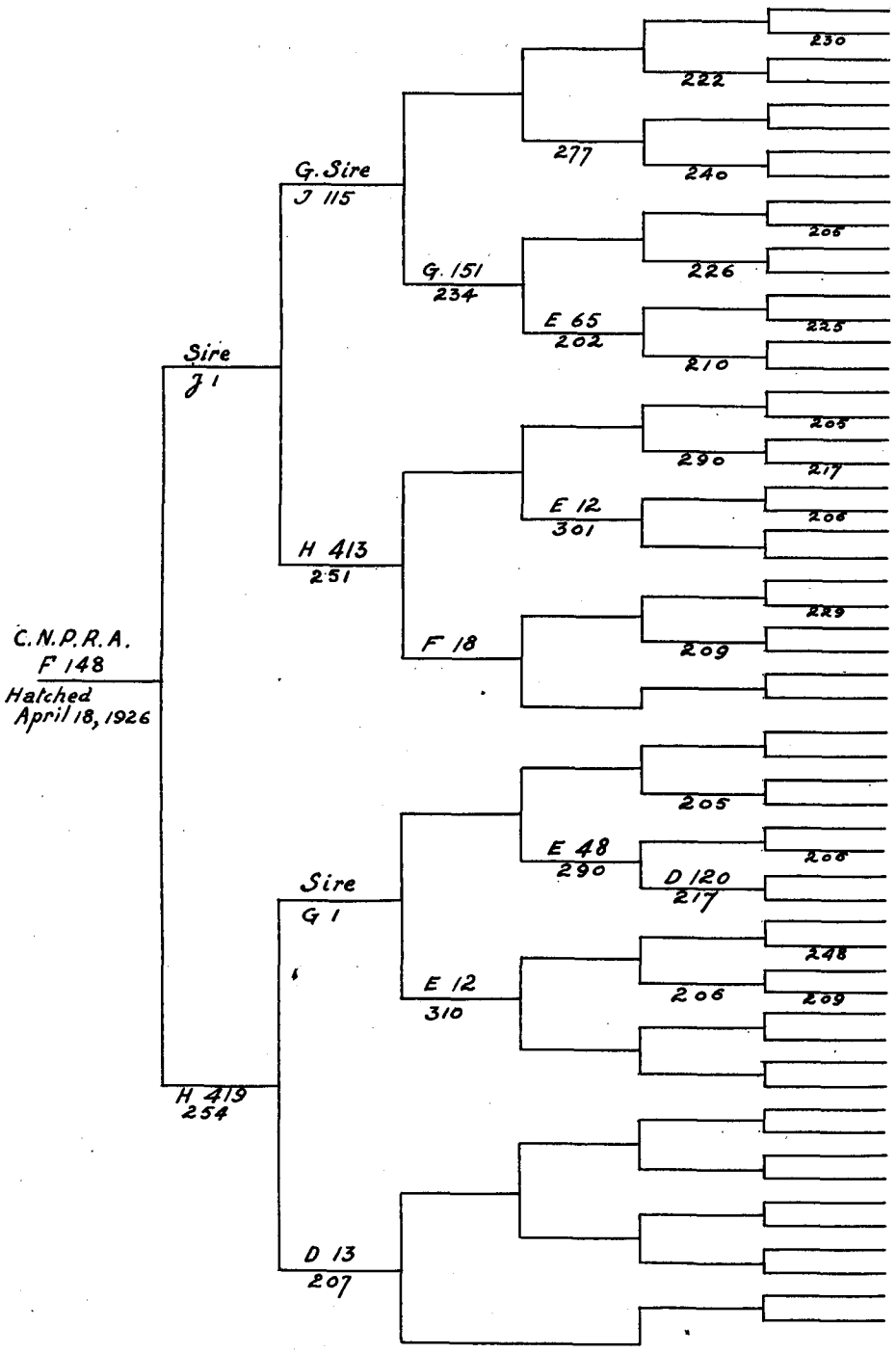
Four of the colony houses at this Station were used in the spring of 1927 as special pens for breeding stock. Each pen consisted of 16 to 18 Barred Plymouth Rock hens which had made a good record of egg-production and laid good-sized eggs as well. These females were mated about February 15 to males which were from hens that had produced eggs of good size and shape, as well as being good individuals of the breed. The pedigree of the male used in Pen A is given in the accompanying graph.

This young male had 29 ancestors which had made records of over 200 eggs each in their pullet year.

The females used in Pens A and B are given below with their respective egg-records for their pullet year:—

PEN A

Hen No.	Egg-record	Hen No.	Egg-record
C.G. 113	203	H 275	242
C.G. 116	226	H 308	241
C.G. 127	214	H 309	263
C.G. 131	223	H 332	249
C.F. 173	249	H 353	275
C.F. 175	243	H 435	242
C.F. 179	223	I 510	277
C.E. 163	209	I 511	253
		I 562	262



Pedigree of male used in pen A.

The average egg-record of these females during their pullet year was 240 eggs each, with an average egg-size of 24¾ ounces per dozen. The first eight hens mentioned above are registered birds, and from these hens 244 eggs were set, of which 94·26 per cent were fertile, and 59·56 per cent of the fertile eggs were hatched. From the other nine hens mentioned, 159 eggs were set, of which 93·71 per cent were fertile, and 66·44 per cent of the fertile eggs were hatched. From the total seventeen hens in Pen A, 403 eggs were set, of which 94·04 per cent were fertile, and 62·27 per cent of the fertile eggs were hatched.

PEN B

Hen No.	Egg-record	Hen No.	Egg-record
J 640	209	I 508	242
J 642	240	I 535	228
J 688	237	I 551	207
J 697	230	I 553	226
J 705	217	I 571	231
J 761	241	H 296	227
J 781	241	H 319	222
J 810	227	H 335	222
J 819	214	H 425	228

The average egg-record of these 18 females during their pullet year was 227 eggs each, with an average egg-size of twenty-five ounces per dozen. The male used in this pen was a full-brother to the one used in Pen A. From this pen 468 eggs were set, of which 94·87 per cent were fertile, and 60·13 per cent of the fertile eggs were hatched.

INCUBATION

The first lot of hatching eggs was put into the incubators on March 12, and the machines were kept going until May 23. Two thousand and seventy-one chicks were hatched during that time, eight hundred and fifty being kept at this Station, and the remainder were sold as day-old chicks in lots of 50 or less to one person, instead of selling any eggs for hatching. Of these chicks kept for the Station, 96·71 per cent were alive when wing-banded at four weeks of age. In a comparison of the hatching results of eggs set in March and April, the fertility was 79·96 per cent in March as compared with 90·40 per cent during April. Of the total eggs set during March, 40·40 per cent hatched as compared with 57·58 per cent during April. Of the fertile eggs set during March, 50·51 per cent hatched, as compared with 63.69 per cent during April.

AVERAGE FERTILITY AND HATCHABILITY

The fertility of the total eggs used for hatching during the spring of 1927 averaged 85.17 per cent, as compared with 81.55 per cent during the spring of 1926. Of the total eggs set 50·16 per cent hatched as compared with 39·79 per cent of the total eggs set in 1926, while of the fertile eggs 58·90 per cent hatched as compared with 48·78 per cent of the fertile eggs in 1926. Forty-five hens gave 100 per cent fertility of total eggs set from them.

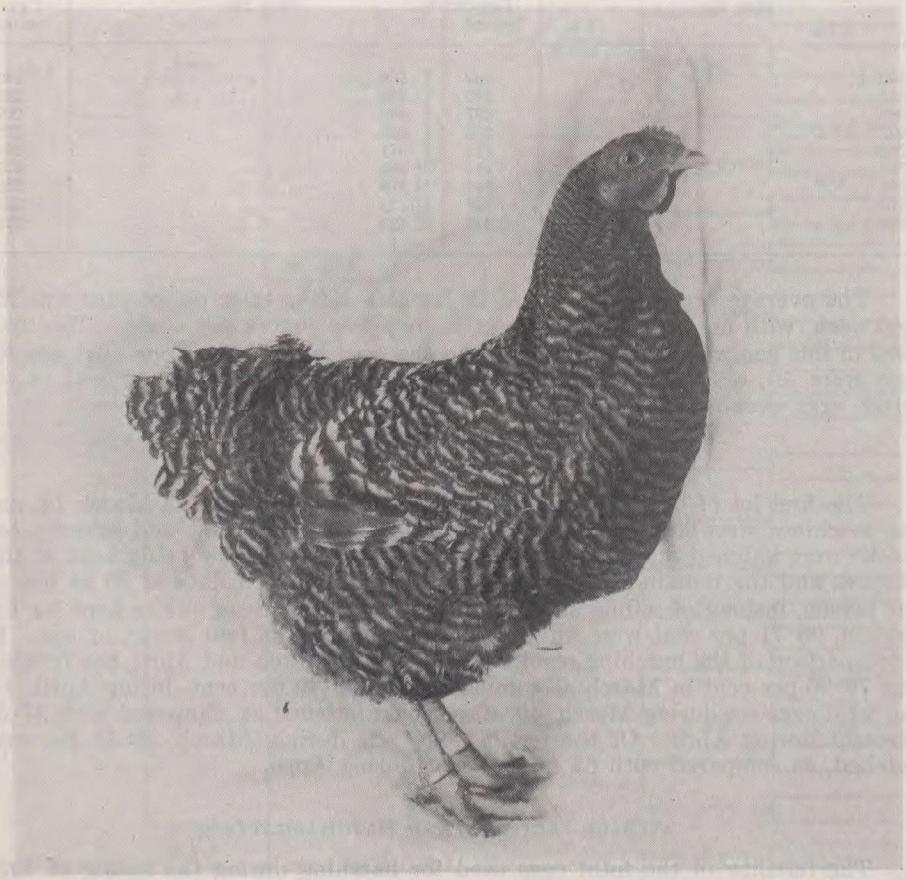
HATCHING RESULTS OF HENS VS. PULLETS

The hen eggs used for hatching during the spring of 1927 gave an average fertility of 90·28 per cent, as compared with 76·26 per cent fertility from the pullet eggs. Of the total hen eggs set, 53·89 per cent hatched as compared with

41·96 per cent from the pullet eggs set. Of the fertile hen eggs set, 59·89 per cent hatched as compared to 55·03 per cent in the case of the pullets. Mortality among the chicks that were hatched from the hen eggs was practically nil.

COST OF FEEDING LAYING PULLETS

An average of 125 Barred Plymouth Rock pullets were housed in the permanent straw loft type laying houses from November 1, 1926, to October 31, 1927. These pullets produced during that time 19,456 eggs, or 1,621¼ dozens which, when figured at the average market price for the year, would



C.H. 188. Three hundred and five eggs in three hundred and sixty-five days.

amount in value to $834.98. The average per cent production per day throughout the year was 44·20. The feed consumed by these birds during the year, when valued at local market prices, amounted to $316.26, or an average of $2.53 per bird for the year. The average value of the eggs produced by each bird during the year amounted to $6.67 which, when the cost of feed is deducted, would leave an average profit per bird of $4.14 over cost of their feed. A number of pullets made records of over 200 eggs each during the year, and an outstanding record was made by No. C.H. 188, a Barred Rock, that produced

305 eggs in 365 days from the time that she produced her first egg. The total market value of the eggs produced by this bird amounted to $12.82, and after deducting $2.35 for the cost of feed, she gave a profit over cost of feed of $10.47. Below is shown the record of this bird each month of the year:—

YEARLY PRODUCTION OF HEN NO. C.H. 188

Pen No. Hatched May 1, 1926 Wing label, E. 1766
Check Band No. E. 15299R.
Variety, B.P.R. Out of mating, ♂ / ♀ C.F. 175 Adult Band No. C.H. 188

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Totals
November	1	1	1	1			1	1	1		1	1		1	1	1	1		1	1	1	1		1	1	1			1			21
December	1		1	1	*1		1	1	1		1	1	1	1		1	1	1	1		1	1	1		1	1		1	1		1	23
January	1	1	1	1	1		1	1	1	1		1	1	1	1	1		1	1		1	1	1	1		1	1	1	1	1		25
February	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1		1	1	1	1				25
March	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	29
April	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		29
May	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	29
June	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1	1	1		1		27
July	1	1	1	1	1	1	1	1		1	1		1		1	1	1	1	1	1	1	1	1	1	1		1	1	1		1	26
August	1	1	1	1		1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1				25
September	1		1		1	1	1	1	1		1	1			1	1	1	1		1	1	1	1		1	1	1	1	1	1		23
October	1	1		1	1	1		1	1	1	1		1	1		1	1		1	1	1		1	1	1	1	1		1	1		23
																																305

Age at first egg, 218 days. Egg record, 305.
Pullet body weight, 3·9. Egg colour, Brown. Egg shape, Oval. Egg weight, 23.
Adult body weight, 5·5. Egg colour, Light Brown. Egg shape, 1¾ x 2¾. Egg weight, 24.
*First egg.

COST OF FEEDING BREEDING HENS

An average of 86 breeding hens were kept during the year 1927. These hens made their records during their pullet year as producers, and were kept for their value as reproducers of good stock. They were not fed for heavy egg-production during the winter months, but rather given a rest period so as to be in strong condition for the production of hatching eggs of good quality. These 86 hens produced during the year 7,884 eggs, or 657 dozens, and if these eggs were figured at market value they would have amounted in value to $338.35, or $3.93 per bird, which, after deducting $2.23 per bird as cost of feed for the year, would leave $1.70 per bird over cost of feed. Owing to a great variation in value of the eggs used for hatching from these hens, they have all been figured at the average market value.

COST OF EGG PRODUCTION DURING TWELVE MONTHS

The average cost of feed to produce eggs from pullets during twelve months, November 1, 1926, to October 31, 1927, was 24·9 cents per dozen, and the average cost of feed to produce eggs from pullets during the past four years, was 20·6 cents per dozen. The average per cent production per day for the past four years was 46·32, and the average profit over cost of feed from pullets during the past four years was $4.18 per bird per year.

EGGS REQUIRED TO PAY FOR FEED

During the four winter months, November 1, 1926, to February 28, 1927, the cost for feed per pullet was 77·29 cents. The prevailing market price of eggs during that time averaged 66 cents per dozen, thus requiring each pullet to lay at least 14 eggs during the four winter months in order to pay for her feed.

During the twelve winter months, November 1, 1926, to October 31, 1927, the cost for feed per pullet was $2.53. The prevailing market price of eggs during that time averaged 52 cents per dozen, thus requiring each pullet to lay at least 59 eggs during the year in order to pay the cost of her feed.

SUMMARY OF EIGHT YEARS' WORK WITH PULLETS VS. HENS

The keeping accounts over a period of eight years, have enabled the summarizing of averages which should be interesting.

PULLETS

Average number of pullets used in pens each year	No.	138
Average cost of feed consumed per bird each year	$	2 39
Average number of eggs produced per bird each year	No.	168
Average price of eggs per dozen each year	cts.	0 49
Average per cent production per day each year	%	44·74
Average profit over cost of feed per bird each year	$	4 43

HENS

Average number of hens used in pens each year	No.	81
Average cost of feed consumed per bird each year	$	2 11
Average number of eggs produced per bird each year	No.	116
Average price of eggs per dozen each year	cts.	0 49
Average per cent production per day each year	%	31·58
Average profit over cost of feed per bird each year	$	2 63

NOTE.—If the eggs which were used for hatching purposes from the hens had been figured even at reasonable prices for hatching instead of the regular market price, there would have been an average of $1.42 per bird to add to the profit over cost of feed per year. It would have then been $4.05 profit over cost of feed per bird instead of $2.63 as mentioned above.

EGG-LAYING CONTEST

The fifth Quebec Western Egg-Laying Contest to be conducted at the Lennoxville Station was commenced on November 1, 1926, and was completed on October 30, 1927. This contest had ten pens of Single Comb White Leghorns, five pens of White Wyandottes, three pens of Barred Plymouth Rocks, one pen of Rhole Island Reds and one pen of Chanticlers. The total number of eggs produced during the 52 weeks of the contest was 33,868, with a total of 35,327 points. Comparing the results of total production with that of the previous contest, there was an increase of 1,647 eggs, and an increase of 4,124 points. The highest producing pen during the fifth contest gave 2,147 eggs as compared with 2,059 eggs in the fourth contest, and the pen giving the highest production by points had 2,342·7 points as compared with 2,080·3 for the highest pen for points in the fourth contest.

The following will give the six highest pens according to the number of points, as well as to the owners of the pens:—

HIGHEST PENS ACCORDING TO POINTS

Pen 15-W.W.	Miss R. G. Knight, Beebe, P.Q.	2,342·7 points
Pen 8-W.L.	Fred Bell, Ayer's Cliff, P.Q.	2,340·2 "
Pen 2-W.L.	Circle Bar Poultry Farm, Calumet, P.Q.	2,310·9 "
Pen 17-B.R.	H. R. Drew, North Hatley, P.Q.	2,170·0 "
Pen 18-B.R.	Experimental Station, Lennoxville, P.Q.	2,159·8 "
Pen 12-W.W.	Bond Little, North Hatley, P.Q.	2,076·0 "

The six highest individual birds, according to points, are given as follows:—

HIGHEST INDIVIDUAL BIRDS ACCORDING TO POINTS

H. 81-W.L.	Fred Bell, Ayer's Cliff, P.Q.	312·5 points
H. 151-W.W.	Miss R. G. Knight, Beebe, P.Q.	309·9 "
H. 141-W.W.	Miss R. G. Knight, Beebe, P.Q.	306·9 "
H. 134-W.W.	Fred Bell, Ayer's Cliff, P.Q.	302·4 "
H. 183-B.R.	Experimental Station, Lennoxville, P.Q.	290·8 "
H. 23-W.L.	Circle Bar Poultry Farm, Calumet, P.Q.	281·1 "

The bird laying the most eggs during this contest produced 24 more than the highest in the previous contest, and the individual having the most points during this contest had 34·3 more than the highest in the previous one. Altogether 49 birds qualified for registration in the fifth contest by producing over 200 eggs of not less than an average weight of 24 ounces per dozen, and free from any disqualifications of the breed that they represented. The following are a list of owners who had birds registered in this contest:—

OWNERS WHO HAD BIRDS REGISTERED IN THE CONTEST

Pen No.	Breed	Owner and address	Birds registered
1	W.L.	Montreal Poultry Farm, Montreal West, P.Q.	2
2	W.L.	Circle Bar Poultry Farm, Calumet, P.Q.	7
3	W.L.	H. Henry, Ste. Agathe des Monts, P.Q.	3
4	W.L.	Laurel Poultry Farm, Rougemont, P.Q.	1
5	W.L.	W. M. Parsons, Barnston, P.Q.	1
6	W.L.	C. D. Calder, Cowansville, P.Q.	3
8	W.L.	Fred Bell, Ayer's Cliff, P.Q.	6
10	W.L.	O. Moring, Dorval, P.Q.	1
12	W.W.	Bond Little, North Hatley, P.Q.	3
13	W.W.	Fred Bell, Ayer's Cliff, P.Q.	3
14	W.W.	Miss R. G. Knight, Beebe, P.Q.	2
15	W.W.	Miss R. G. Knight, Beebe, P.Q.	7
16	B.R.	J. E. Burnet, Cowansville, P.Q.	1
17	B.R.	H. R. Drew, North Hatley, P.Q.	3
18	B.R.	Experimental Station, Lennoxville, P.Q.	2
19	R.I.R.	Macdonald College, Macdonald College, P.Q.	2
20	Cha.	Oka Agricultural Institute, La Trappe, P.Q.	2

It is very encouraging to know that 15 of the above registered birds are second generation birds.

COST OF FEEDING THE CONTEST BIRDS

During the 52 weeks of the fifth Quebec Western Contest the birds consumed 9,144 pounds of scratch-grain, 10,717 pounds of meal mixture, 590 pounds of beef-meal and ground bone supplied in addition to the quantity in the meal mixture, 311 pounds of grit, 998 pounds of oyster-shell and 7,280 pounds of green feed. The average feed consumed per bird was 38·1 pounds of scratch-grain, 44·6 pounds of meal mixture, 2·5 pounds of extra beef-meal or green bone, 1·3 pounds of grit, 4·2 pounds of oyster-shell and 30·3 pounds of green feed. The total cost of this feed amounted to $543.59, or an average cost of $2.27 per bird for 52 weeks. The total eggs produced, when valued at the prevailing market price during the time at which they were produced, amounted in value to $1,556.33. Deducting the total cost of feed from the value of the eggs produced gave $1,012.74, or an average of $4.22 per bird profit over the cost of their feed.

The pen making the most revenue over cost of feed was the pen of White Wyandottes owned by Bond Little, of North Hatley, P.Q. This pen of birds gave an average of $6.52 per bird profit over the cost of their feed. They consumed during the 52 weeks of the contest, 483 pounds of scratch-grain, 688 pounds of meal mixture, 29·5 pounds of extra beef-meal or green bone, 14 pounds of grit, 55 pounds of oyster-shell and 364 pounds of green feed. The following table gives a summary of date according to the different breeds in the fifth contest.

FIFTH QUEBEC WEST LAYING CONTEST, 1926-27, LENNOXVILLE, QUE.

Breed	Number of birds entered	Per cent laid less than 100 eggs	Per cent laid less than 150 eggs	Per cent laid over 150 eggs	Per cent laid over 200 eggs	Per cent laid over 225 eggs	Per cent birds registered	Average egg-size of registered birds	Average egg-size of total birds	Average weight of birds when entered	Average weight of birds when leaving	Average cost per bird for feed	Average profit per bird over feed	Average eggs per registered bird	Average eggs per bird in contest
	No.	per cent	per cent	per cent	per cent	per cent	per cent	oz.	oz.	lb.	lb.	$	$	No.	No.
S.C. White Leghorns	120	15·0	36·7	61·7	24·2	10·8	20·0	25¼	24·3	3¾	3½	2·20½	4·64¼	222½	159
White Wyandottes	60	13·3	31·7	68·3	43·3	16·7	25·0	25½	24·6	5	5½	2·48½	4·10½	219¾	172
Barred Plymouth Rocks	36	27·7	27·8	69·5	36·1	19·4	16·7	24½	24·4	4½	5½	2·23½	3·62	229½	147
Rhode Island Reds	12	33·3	50·0	50·0	25·0	16·7	16·7	25½	24·3	4½	4½	2·18¼	3·11½	232	134
Chanticlers	12	58·3	83·3	16·7	16·7	None	16·7	24¼	23·8	3¾	4	1·93¾	1·50½	210½	85

From the records of costs, revenue, production and registration tabulated during the last five years of contest work at Lennoxville, the following summary has been prepared:—

SUMMARY OF FIVE CONTESTS CONDUCTED AT LENNOXVILLE, QUE.

Breed	Number of birds entered in five years	Number of birds laid less than 100 eggs	Number of birds that laid over 150 eggs	Number of birds that laid over 200 eggs	Number of birds that laid over 225 eggs	Number of birds registered	Average eggs per bird per year in contest	Average cost of feed per bird per year	Average profit over feed per bird per year
	No.	No.	No.	No.	No.	No.	eggs	$ cts.	$ cts.
S.C. White Leghorns	390	49	253	92	36	48	163	2 10	4 02
White Wyandottes	240	21	152	56	22	35	167	2 29	4 09
Barred Plymouth Rocks	316	40	179	72	32	32	156	2 27	3 32
Rhode Island Reds	52	20	23	4	2	2	124	2 07	2 03
Chanticlers	22	15	2	2	0	2	81	2 00	1 25
Silver Wyandottes	20	7	2	0	0	0	107	2 01	1 57

INSPECTION AND REGISTRATION

During the past four years, the work of inspection of all registered birds in this district has been handled by this Station. Each breeder of registered birds has been visited at least three times during the year, to approve the breeding stock, to inspect the chick and hatching records, and to inspect and wing-label the progeny from the registered birds. Twelve breeders had forty-two registered hens in the breeding work in 1927, from which 587 chicks were pedigreed, 161 of these being pullets that qualified to be banded by the Inspector with the Canadian National Poultry Record wing-label, and 83 of them are entered in egg-laying contests now. Splendid results were obtained by these breeders during 1927, and as there were a good number of second generation birds registered in 1927 contests, the work will be even more advanced during the year just commenced.

BEES

HONEY FLOW

Owing to the mild weather early in the spring of 1927, the colonies of bees were removed from the cellar on April 6, at which time bees from the colonies wintered outside in wintering cases had made several good flights. As the result of favourable weather during April, colonies built up rapidly, the hive on scales showing a net gain of 2½ pounds during the last ten days of the month. In so far as could be determined, most of this unusually early flow came from elm and maple which was in full bloom during the last two weeks in April. Bees were also observed carrying pollen freely on April 10.

During May and June the weather was unfavourable, being cool and showery. Accordingly, although there was an abundance of early bloom, the hive on scales showed very little gain previous to the last few days in June. As usual July proved to be the month in which practically all of the surplus honey was gathered. At no time were large gains made during the honey flow and on the whole the crop was somewhat below average. During August and September conditions were about average, no net gain being recorded for either month. Following is a summarized statement of the honey flow for 1927, together with an average for the past four years:—

HONEY FLOW 1927, AND AVERAGE 1924 TO 1927

—	May	June	July	Aug.	Sept.	Total gain over loss
	lb.	lb.	lb.	lb.	lb.	lb.
Net gain in 1927	2·50	14·00	68·75	.....	.....	60·00
Net loss in 1927	.....	.....	.....	15·00	10·25	.....
Average net gain 1924 to 1927	.....	22·75	93·50	.....	.....	130·43
Average net loss 1924 to 1927	2·38	.....	.....	4·06	6·38	.....

For the past four years a colony of average strength has been kept on a set of scales and a daily record kept of its weight. In general it has been noted that only on comparatively few days are gains recorded, and also, that when conditions are favourable such gains are quite large. Following is a

statement showing the highest daily gain for the past four years, together with the number of days in each month from May to September on which gains were made.

HIGHEST DAILY GAINS AND DAYS IN WHICH NO GAINS WERE MADE, 1924 TO 1927

—	May	June	July	Aug.	Sept.
	lb.	lb.	lb.	lb.	lb.
Highest gain recorded in one day 1924	0·50	7·25	15·25	3·00	0·50
Highest gain recorded in one day 1925	1·25	8·00	12·00	2·25	0·50
Highest gain recorded in one day 1926	0·50	2·50	9·00	2·00	0·50
Highest gain recorded in one day 1927	4·75	7·00	11·75	2·25	2·25
Number of days in which gain was made 1924	4	20	23	12	5
Number of days in which no gain was made 1924	27	10	8	19	25
Number of days in which gain was made 1925	9	16	22	14	9
Number of days in which no gain was made 1925	22	14	9	17	21
Number of days in which gain was made 1926	2	12	25	5	4
Number of days in which no gain was made 1926	29	18	6	26	26
Number of days in which gain was made 1927	5	11	19	10	6
Number of days in which no gain was made 1927	26	19	12	21	24

SOURCES OF NECTAR

As one of the projects in connection with bee-keeping at this Station, a record is kept of the approximate date and duration of the various honey flows. Clover of course is the main source from which surplus honey is obtained, but other sources such as willow, dandelion and golden-rod, although less conspicuous, are nevertheless important in the building up and maintaining of colony strength. Following is a statement of the duration of the principal sources of nectar in 1927 together with a summary of meteorological records during each period:—

SOURCE AND DURATION OF HONEY FLOWS, 1927

Source	Begun	Ended	Duration	Means of extreme temperature		Total hours of sunshine	Precipitation
				Max.	Min.		
			days			hours	inches
Willows	April 10	May 15	15	55·36	34·72	103·9	2·88
Dandelion	May 11	June 11	31	63·58	41·74	146·6	5·71
Fruit bloom	May 20	June 10	21	63·47	39·61	124·1	3·53
Clovers	June 19	Aug. 2	43	76·88	52·38	274·0	3·05
Raspberry	June 30	July 15	15	78·46	44·60	91·1	1·24
Basswood	No record kept						
Golden-rod	Aug. 9	Sept. 2	24	74·45	48·75	150·3	3·83

TYPES OF HIVES

Two colonies each in eight, ten and twelve Langstroth, and ten-frame Jumbo hives, were requeened during the summer of 1926. These wintered successfully and all were of good average strength in the spring of 1927. Both the eight and ten-frame Langstroth hives were found to be inadequate as brood chambers and were enlarged early in the season by the addition of an extra super of standard depth to the eight-frame hive and a shallow super to the ten-frame. Even with this precaution one colony in an eight-frame hive swarmed unexpectedly. The other colony in the eight-frame hive and one in the ten-frame hive built queen cells and were Demarred to prevent swarming. The other ten-frame colony became queenless early in the season and produced

a very small surplus. With one twelve-frame hive the queen became non-prolific and the hive was requeened. The other colony in the twelve-frame hive was dequeened and requeened during the honey flow to prevent swarming. The colonies in Jumbo hives built queen cells early and were dequeened and requeened. Following are the results obtained from each type of hive in 1927 and the average production of honey for the past two years:—

COMPARISON OF TYPES OF HIVES

Type of hive	Number	Average number of frames covered by bees May 4	Average stimulative feeding in spring	Average net production of honey 1927	Average net production of honey 1926 and 1927
			lb.	lb.	lb.
8-frame Langstroth	1	7	8·75	85·0	116·12
10-frame Langstroth	1	7	.....	51·75	53·33
12-frame Langstroth	1	7	4·75	59·5	121·87
10-frame Jumbo	2	8	4·75	78·62	155·5

WINTERING

The winter of 1926 and 1927 was less severe than usual, and owing to the very early spring, the period between the last cleansing flight in the fall and the first in spring was comparatively short. As a result very little difficulty was experienced in wintering bees in this district, and colonies were, as a rule, above average strength when first examined in the spring.

At this Station twelve colonies were placed in the cellar on November 23, and eight were left outside in quadruplicate wintering cases. The cases were placed around the colonies wintered outside early in October and packed to the level of the hive body with planer shavings. Later when feeding was finished the packing was completed. Two colonies in each wintering case were supplied with a shallow super as an extra food chamber. The other two colonies in each case were left in single hive bodies. The last cleansing flight of the bees occurred on November 15.

Of those wintering in the cellar none died during winter, although one was found to be queenless at the first examination in the spring and was united with another colony. Of the eight colonies that were wintered outside seven were found to be in good condition while one which was below strength had to be united. Following is a comparison of the results obtained from the colonies wintered in the cellar and outside:—

CELLAR VS. OUTSIDE WINTERING

Kind of wintering	Kind of hive	Food chamber.	Number of colonies in experiment.	Average number of combs of bees on Sept. 14, 1926.	Average number combs of brood on Sept. 14, 1926.	Average number combs of bees on May 4, 1927.	Average number combs of brood on May 4, 1927.	Number of colonies found queenless at first examination.	Number of colonies that had to be united.	Average net production of honey per colony.	Natural swarm issue.
Cellar	Langs. 10-frame	.....	6	10·0	3·0	8·33	4·66	1	1	38·45	.....
Outside	10-frame	.....	4	10·0	3·75	8·75	6·50	.....	.....	63·06	1
Outside	10-frame	S.S.*	4	12·5	3·0	9·00	4·12	.....	1	41·25	.....

*S.S. signifies shallow super used as food-chamber.

FALL FEEDING

On the whole all colonies were in good condition in the fall of 1927 and did not require heavy feeding to bring them up to the required weight for satisfactory wintering. In all twenty-one colonies were fed sugar syrup composed of two parts of sugar to one of water, the net average weight of sugar required by each colony being 13.47 pounds. Following is a statement showing the amount of sugar fed to colonies in each type of hive:—

FALL FEEDING 1927

Kind of hive	Number of colonies in experiment	Average number of combs covered by ball of bees at 42° F.	Average weight before feeding	Average amount fed	Average weight after feeding	Average gain during feeding
			lb.	lb.	lb.	lb.
8-frame Langstroth	2	7·5	45·75	14·25	59·12	13·37
10-frame Langstroth	5	9·5	51·03	13·82	63·05	12·02
12-frame Langstroth	2	11·5	61·87	13·25	79·75	17·38
10-frame Jumbo	2	9·0	58·62	16·0	75·62	15·00

YIELD AND INCREASE

The eighteen colonies remaining, after uniting all weak ones, made a total net production of 991.25 pounds, or an average of 55.09 per colony. The apiary was also increased to twenty-one colonies, which were in good condition at the last examination in the fall.

FIBRE PLANTS

HEMP

Although some difficulty is usually experienced in the fall retting of hemp straw, the season at Lennoxville is on the whole decidedly favourable for the production of hemp. During the past five years hemp has been grown at this Station on all available types of soil, in varying states of fertility, with excellent results. In general yields have been high and the quality of the fibre satisfactory. As a crop hemp makes a quick response to high soil fertility and with the ample rainfall usually experienced in this district, growth is frequently very strong, the crop at cutting time usually being ten to twelve feet high.

The season of 1927 was in many respects the most favourable for the hemp crop so far experienced at this Station. Owing to the early spring it was possible to prepare an excellent seed-bed for early seedings. Germination was satisfactory and throughout the growing season the crop made a steady growth being ready for cutting several days earlier than in previous seasons. During late summer and early fall the weather was quite satisfactory for retting the spread crop, and very little difficulty was experienced in securing a quick and uniform ret. From 1923 to 1926 the average length of time required to ret hemp spread on sod land was thirty-seven days. In 1927 the various lots of hemp that were spread required from seventeen to twenty-eight days.

DIFFERENT DATES OF SEEDING.—For the past four years seed of a good variety of hemp has been sown at three different dates in the spring; the first

as early as the ground can be put in shape and the other two at intervals of about two weeks. Following are the average results obtained:—

HEMP, DIFFERENT DATES OF SEEDING—AVERAGE OF RESULTS, 1924 TO 1927

Time of seeding	Height	Stage when cut	Yield per acre		Fibre and tow in retted straw
			Fibre	Tow	
	ft. in.		lb.	lb.	per cent
Late April or early May	9 11	Bloom falling	1,246	800	17·6
Middle of May	8 8	Full bloom	1,040	631	18·3
Late May or early June	8 3	Bud to partial bloom	1,029	662	17·7

For the first two years that this project was conducted the earliest seeding germinated very poorly and produced a thin stand of plants. These made a very vigorous growth, branched freely, and developed stout stems which retted slowly, and, when scutched, produced a coarse uneven grade of fibre and a high proportion of tow. In the year 1926 and 1927, however, the early seeding germinated satisfactorily, and gave a high yield of fibre of good quality. With the early seeding it has also been observed that the crop reaches a desirable stage for cutting comparatively early in the season, and can thus be spread early enough to ret satisfactorily before the usual cool fall weather sets in. It would seem, therefore, that the best results are obtained from early seeding, and to insure against poor germination caused by planting in cool soil, a fairly heavy rate of seeding is advisable.

Different Rates of Seeding.—In this project triplicate plots are seeded at the rates of forty, fifty and sixty pounds per acre. Following are the average results for the past three years:—

HEMP, DIFFERENT RATES OF SEEDING—AVERAGE OF RESULTS, 1925 TO 1927

Rate of seeding per acre	Height	Yield per acre			Fibre and tow in retted straw	Average quality of fibre
		Retted straw	Fibre	Tow		
	ft. in.	tons lb.	lb.	lb.	per cent	
40 pounds	11 4	5 585	1,078	759	17·4	Coarse.
50 pounds	10 1	4 1,215	1,356	732	22·9	Medium to fine
60 pounds	7 11	4 1,359	1,335	753	22·3	Fine.

From the foregoing statement it may be noted that seeding at fifty pounds per acre has given a little more fibre and slightly less tow per acre than the heaviest seeding of sixty pounds. The heavy stand of the sixty pound seeding, however, has a tendency to dwarf the crop and thus produce a short but fine straw. Such straw rets quickly, produces a finer and more uniform grade of fibre, and is easier to handle and process than coarse straw. In general, therefore, it would seem that the best results may be expected from comparatively heavy seedings.

Cutting at Different Stages.—From the results obtained during the past three seasons, it would seem that the time to cut hemp, at Lennoxville, is governed more by the time in the season than by the condition or stage of

the crop. In normal seasons hemp, if cut before the middle of August, can be spread and will usually ret in from three to four weeks. If cut later in the season, the cool weather usually experienced during September, retards retting and the crop frequently requires from six to eight weeks for that operation. The result is usually an uneven ret, and owing to the lateness in the season, the crop dries slowly and frequently must be lifted when quite damp. In this condition it is difficult to process and in cleaning the fibre a larger portion is cut away into tow than if the crop were dry. If sown reasonably early, hemp will reach full bloom before the middle of August at which stage it will make good fibre. Cut when in bud the crop has produced a weak fibre, with a high percentage of tow, and a comparatively low yield. Cutting when bloom has fallen, which is usually about September first, has, owing to its lateness, proven unsatisfactory. Accordingly, it would seem that if the crop reaches full bloom by the middle of August, it should be cut. Also that if full bloom is later than the middle of August, cutting should not be delayed too long as the damage to the fibre by slow and imperfect retting may outbalance the reduction in quantity and quality of the crop brought about by cutting while too immature.

Drilling vs. Sowing Broadcast.—This project has been conducted each season, in duplicate or triplicate plots, for the past four years, but so far the results obtained have not indicated that either method is superior. In 1924 and 1925 the seed sown broadcast with a drag-harrow did not germinate as well as that sown with an ordinary grain drill. As a result the yield of fibre and tow from the drilled plots was larger than from those sown broadcast. In 1926 and 1927, however, conditions for germination at the time hemp was sown, were ideal and a good stand was obtained with both methods. Accordingly, under average conditions, which are rarely ideal, drilling is probably the most satisfactory method of sowing.

Cost of Production.—For the past three years a half-acre of hemp has been grown and an account kept of the cost of production and returns obtained. Owing to the lack of suitable machinery the cost has been about thirty-five dollars higher per acre than if modern machinery had been used. In spite of this handicap, however, the crop in 1925 gave a profit of $51.59 and that in 1926 a profit of $27.90 per acre. The crop in 1927 was handled at a cost of $137.80 per acre, and produced a yield of 946 pounds of scutched fibre, and 432 pounds of tow per acre. At the time of writing this report, information as to the value of hemp fibre and tow is not available, but at the same price as that obtained for the 1926 crop, it would have a value of $148.08, thus showing a profit of $10.28 per acre.

FLAX

In general the results obtained from growing flax for fibre at this Station have been unsatisfactory, as either a very low yield has been obtained or a poor quality of fibre. In 1927 a project to determine the most satisfactory time for seeding was conducted and four seedings were made; the first in late April and the remainder at intervals of about ten days. Germination from all seedings was satisfactory, but the crop grew slowly and was of poor quality all of it being processed into tossed tow. Slightly better yields were obtained from the two early seedings.

GENERAL NOTES

EXCURSIONS.—This Station was highly honoured, on May 28, by a visit from the Hon. Mr. Motherwell, Minister of Agriculture, and his party, who were touring the province of Quebec at that time.

The St. Francis District Ayrshire Club held their annual Field Day and meeting at the farm on June 18 with an attendance of approximately 250 people.

The Cercle de Fermières of Stanstead, P.Q., which is an organization of farmers' wives, arranged an excursion to the Station and forty members were present, all being very much interested in horticulture, floriculture, poultry and bees.

The St. Francis Valley Holstein-Freisian Club held their field Day at the Station on June 25, when they put on a demonstration and judging competition and held a sale of calves donated to the club by breeders in order to raise funds for the club.

The June Jersey Jubilee picnic and sale was held at this Station June 30, with a very good attendance. There were thirteen heifer calves donated to the club by the different breeders, which were sold by auction and realized over $1,200. This is money used for special prizes at various exhibitions and propaganda work for the breed.

The Provincial Seed Board visited the Station on August 9, and made an inspection of the various lines of work being conducted for them with cereals and forage crops.

The thirteenth annual Field Day was held at this Station on August 10, with the usual large attendance of farmers and their families as well as others from various sections of the Eastern Townships. The weather was fine and the visitors took a keen interest in the various lines of work being conducted at the Station.

On August 11, the agronomes and their assistants, of the nineteen counties comprising this district, assembled at the Station with officials of the animal husbandry divisions of both the Federal and Provincial departments of agriculture to take a course in live stock judging before taking up judging work at the various local fairs.

Mr. R. C. McWilliams, County Agricultural Agent, for Franklin County in northern Vermont, with headquarters at St. Albans, Vt., motored 110 miles with 50 of his people, on August 22, to inspect the work carried on at the Lennoxville Station where soil and climatic conditions are very similar to those of northern Vermont. These farmers were very much interested in the various experiments and expressed themselves as well repaid for their long trip.

Representatives from the Station attended and took part in various meetings throughout the year.

EXHIBITIONS.—The first fall fair attended with the Experimental Station exhibit was the three-day fair held at Cookshire, August 16, 17 and 18. The exhibit, comprising a display of fruit, flowers, bees and models of poultry equipment, occupied a prominent space in the main building. Many inquiries were received and answered by members of the staff in attendance.

The Great Eastern Exhibition was held at Sherbrooke from August 27 to September 2. A permanent structure has been erected in the centre of the main building for the Station exhibit which comprised special exhibits from the different divisions such as forage crops, horticulture, floriculture, apiary, poultry, fibre and tobacco. The exhibit attracted much attention and elicited many inquiries on various agricultural questions and requests for literature.

The Station exhibit was also staged at the Compton County Agricultural Society No. 2, fair held at Scotstown on September 6, 7 and 8.

The different members of the staff acted as judges at the various fall fairs in the Eastern Townships.

CORRESPONDENCE.—There were 7,269 letters sent out from the office and 5,028 received during the year 1927, which is quite an increase over the previous year. This does not include annual reports, Seasonable Hints and other bulletins distributed.

The mailing list contains 2,370 English and 2,260 French names, making a total of 4,630. The Correspondence in English and French is about equal at this Station.

OTTAWA: Printed by F. A. ACLAND, Printer to the King's Most Excellent Majesty, 1928.