DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

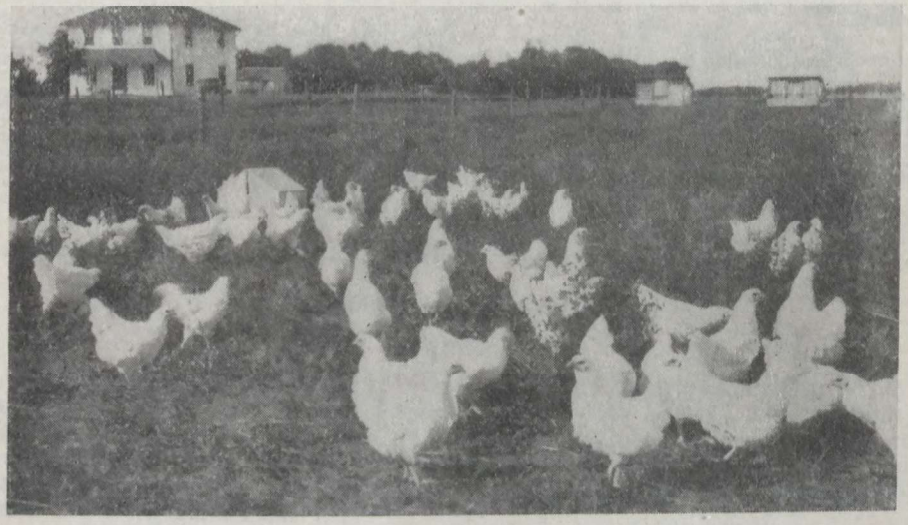
EXPERIMENTAL FARM

INDIAN HEAD, SASK.

REPORT OF THE SUPERINTENDENT

W. H. GIBSON, B.S.A.

FOR THE YEAR 1928



Pullets kept on good open range get full development.

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

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SEASONAL NOTES

Wheat seeding commenced on the Experimental Farm on April 27. The land was in good tilth. Continued dry weather throughout May was responsible in a large measure for the lack of uniformity in germination and consequent uneveness in ripening.

Cutting early varieties of wheat and coarse grains commenced on August 11 with harvest operations general about August 20.

Damaging frost was recorded on August 24, doing considerable injury to the wheat crop throughout the country.

During the early spring a new greenhouse was erected, which will permit of more extensive work in horticulture.

Early in the spring Mr. G. D. Matthews, Assistant in charge of cereal and forage crop work was transferred to Scott Experimental Station as Superintendent. Mr. J. G. Davidson was appointed to fill the vacancy.

METEOROLOGICAL RECORD, 1928

Month	Temperature—F.						Precipitation				Sunshine		Evaporation
	Mean		Maximum		Minimum		Rain	Snow	Total precipitation				
	1928	Average 20 years	Highest	Mean	Lowest	Mean			1928	Average 20 years	1928	Average 20 years	
	°	°	°	°	°	°	in.	in.	in.	in.	hours	hours	in.
January	15·74	0·65	42	18·97	−32	−0·39	.....	1·50	0·15	0·93	104·5	65·6	.....
February	27·58	5·97	41	24·21	−18	3·31	.....	2·00	0·20	0·80	122·8	95·8	.....
March	20·13	18·64	65	32·06	−17	8·23	.....	17·50	1·75	1·27	129·6	135·0	.....
April	30·06	37·01	72	39·80	2	0·66	0·22	19·50	2·17	1·01	182·8	175·9	.....
May	55·95	49·99	94	70·55	19	38·74	0·64	.....	0·64	2·21	275·6	215·6	4·13
June	56·57	59·35	81	67·40	32	45·73	6·05	.....	6·05	3·09	218·7	229·1	3·44
July	62·48	63·03	88	76·26	41	48·74	2·14	.....	2·14	2·75	284·2	273·6	5·47
August	58·97	61·01	91	74·32	29	43·61	0·34	.....	0·34	2·06	274·3	249·1	5·08
September	49·63	51·33	89	64·70	14	34·56	0·42	.....	0·42	1·70	176·0	167·2	4·08
October	36·84	38·46	68	47·64	5	26·06	0·26	1·50	0·41	1·46	139·8	128·0	1·02
November	28·47	23·34	50	40·60	0	16·33	0·08	.....	0·08	1·05	114·9	69·8	.....
December	18·26	6·52	43	27·19	−21	9·35	.....	1·75	0·17	0·84	61·0	51·9	.....
	.....	.....	.....	.....	.....	.....	10·15	43·75	14·52	.....	2,084·2	.....	23·17

ANIMAL HUSBANDRY

HORSES

Registered Clydesdales are maintained on the Experimental Farm. They are used for work and breeding purposes. The young horses including foals, yearlings, two-year-olds and three-year-olds are wintered out in corrals. Oat straw forms the basic roughage with a liberal ration of grain to keep them in good growing condition. Maintenance cost figures vary with age, feed requirements and work performed.

COST OF MAINTAINING AND RAISING HORSES

Average feed cost maintaining brood mares	$ 47 48
Average feed cost maintaining work horses	83 33
Average feed cost maintaining work horses (seasonal)	80 44
Average feed cost maintaining 3-year-old fillies	47 97
Average feed cost maintaining 2-year-old fillies	42 84
Average feed cost maintaining 3-year-old geldings	49 18
Average feed cost maintaining 2-year-old geldings	39 35
Average feed cost maintaining yearling gelding	57 64
Average feed cost maintaining mature stallion	74 42
Average feed cost maintaining 3-year-old stallion	64 92
Average feed cost maintaining 2-year-old stallion	86 49

Exhibition work with Clydesdale horses was suspended for the year 1928. The three-year-old stallion "His Majesty" bred on the Experimental Farm was hired to the Indian Head Clydesdale Club for the season 1928.

TREATMENT FOR NAVEL-ILL

Experimental work with navel-ill, or joint-ill, has been in progress since 1920, the results of which have been published from time to time. During the past two years the use of vaccines during pregnancy and also vaccination of foal at birth has been discontinued. The mares are given a small teaspoonful of potassium iodide in their drinking water regularly twice per month with obviously excellent results. During 1927 and 1928 the foals were born healthy and vigorous and without any evidence of joint-ill.

CATTLE

BREEDING SHORTHORNS

During the past fall eleven head of Shorthorn females were shipped to the Experimental Station, Scott, Saskatchewan. These will form the nucleus of a milking herd at the Scott Station. The remaining Shorthorns maintained on the Indian Head Farm are beef type. Sires combining the best type and blood-lines are selected for breeding purposes. The present herd sire is an outstanding bull of "Browndale" breeding. The junior herd sire, "Browndale Anchor," was recently purchased from James Douglas, Caledonia, Ontario. This young sire carries excellent type and blood-lines. "Browndale Anchor" is strong in "Browndale" breeding and his grand dam is by the Duthie bull Collynie Knight Royal. This young bull should prove a valuable acquisition to the Experimental Farm herd.

COST OF RAISING SHORTHORN HEIFERS

As in former reports it will be noted that the cost of raising calves to yearlings is comparatively higher, due in a measure, to the cost of milk and other expensive grains consumed.

Average feed cost of raising calves to yearlings	$ 64 25
Average feed cost of raising yearlings to 2-year-olds	17 77

CALF FEEDING EXPERIMENT (SHORTHORNS)

Eight Shorthorn calves approximately the same age were placed on test to compare the feeding value of dry whole milk, dry skim-milk, nursing cows and straight grain. From the data submitted it will be observed that the nursing calves made the greatest daily gains, and were in comparatively better bloom at the conclusion of the experiment. The calves on dry whole milk and dry skim-milk made comparatively good gains, however, it should be pointed out that the price of these commodities are beyond the average breeder, and could only be recommended in preparing young calves for sale or exhibition. Details are tabulated herewith.

Calf Feeding Experiment

Group	Name of Calf	Number of days on test	Initial weight	Final weight	Daily gain	Oats 1½ cent per pound	Barley 1½ cent per pound	Bran 1½ cent per pound	Oil meal 2½ cents per pound	Hay ½ cent per pound	Dry whole milk 33 cents per pound	Dry skim-milk 14 cents per pound	Charge for nursing	Total cost of feed
			lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	$	$
1	Indian Head Rosebud 5th	80	630	740	1·38	105	52½	52½	17½	513	.....	.....	.....	6 21
	Pride of Qu'Appelle 12th	80	570	690	1·50	105	52½	52½	17½	513	.....	.....	.....	6 21
2	Indian Head Queen 6th	80	540	670	1·63	105	52½	52½	17½	513	70	.....	.....	29 31
	Indian Head Mayflower 8th	80	510	670	2·00	105	52½	52½	17½	513	70	.....	.....	29 31
3	Prairie Red Rose 27th	80	600	760	2·00	105	52½	52½	17½	513	.....	70	.....	16 01
	Prairie Red Rose 29th	80	510	670	2·00	105	52½	52½	17½	513	.....	70	.....	16 01
4	Indian Head Janet 3rd	80	310	510	2·50	52½	26¼	26¼	17½	345	.....	.....	9 60	13 37
	Indian Head Mayflower 5th (bull)	80	280	530	3·13	52½	26¼	26¼	17½	345	.....	.....	9 60	13 37

DAIRY CATTLE

The Ayrshire herd at the Experimental Farm numbers nineteen head. The mature milking cows average 9,117·3 pounds of milk testing 4·1 per cent butter fat. The records are tabulated in accompanying table.

AYRSHIRE MILK RECORDS

Name of cow	Date of birth	Date of last calving	Days in lactation period	Total milk production	Average per cent fat in milk	Value of milk produced	Total cost of feed	Profit on product
				lb.		$	$	$
Tullochgorum Dorothy	May 11, 1922	Mar. 27, 1928	280	9,836·8	3·6	245 17	36 58	208 59
Tullochgorum Jean	July 10, 1917	May 31, 1927	372	8,734·9	3·8	250 78	45 22	205 56
Queen of Brackley	Dec. 1, 1919	June 17, 1927	411	8,895·3	5·1	235 84	43 99	191 85
Burnside Nell	Dec. 4, 1918	Mar. 10, 1928	297	8,002·1	3·9	212 60	35 59	177 01
Total			1,360	36,469·1	.....	944 39	161 38	783 01
Average			340	9,117·3	4·1	236 10	40 35	195 75

COST OF RAISING AYRSHIRE HEIFERS

It will be observed from the following figures that it costs considerably more to raise yearlings than two-year-olds.

Average cost of raising calves to yearlings	$ 45 82
Average cost of raising yearlings to 2-year-olds	19 01

SHEEP

The farm maintains a breeding flock of Shropshires which has been built up by the use of imported rams from Great Britain. During the fall a new ram was imported from his breeder N. J. Nunnerly, Shropshire, England. Surplus breeding stock are either sold locally or through the Saskatchewan Sheep Breeders' Sale held every fall in Regina. Five shearling rams were sold through the sale at an average price of seventy-five dollars.

During the fall one hundred feeder lambs were purchased on the Moose Jaw Stock Yards, and placed on comparative feeding tests of frozen feed wheat, frozen feed barley, wild oat chop and ordinary feed oats. Results of this test will be included in the next annual report.

SWINE

A herd of twelve Yorkshire brood sows are maintained on the farm. Stock boars are also maintained for the use of Yorkshire breeders in the district.

SELF-FED VERSUS HAND-FED

Thirty fall pigs were held for experimental feeding and placed in straw covered cabins for the purpose of determining the economy of self-fed versus hand-fed pigs. When fed outside, under winter conditions, it will be observed from the accompanying data that the self-fed lot made the higher average daily gain and the more economical gain.

RESULTS FROM SELF-FED AND HAND-FED PIGS

——	Pen 1	Pen 2	Pen 3	Pen 4
	Self-fed		Hand-fed	
Number of pigs on test	7	8	8	7
Number of days on test	105	105	105	105
Initial weight of pigs lb.	575	575	620	540
Final weight of pigs lb.	1,560	1,800	1,570	1,280
Total gain during test lb.	985	1,225	950	740
Average daily gain lb.	1·3	1·5	1·1	1
Amount shorts consumed lb.	240	254	219	201
At 1½ cents per pound $	3 60	3 81	3 29	3 02
Amount oat chop consumed lb.	1,865	2,282	1,718	1,661
At 1¼ cents per pound $	23 31	28 53	21 48	20 76
Amount barley chop consumed lb.	2,285	2,475	2,058	1,843
At 1¾ cents per pound $	39 99	43 31	36 02	32 25
Amount tankage consumed lb.	300	343	284	260
At 2½ cents per pound $	7 50	8 58	7 10	6 50
Cost of feed consumed $	74 40	84 23	67 89	62 53
Cost of feed per pound gain cts.	7·6	6·9	7·1	8·5

HOG PASTURES

Pasture crops such as rape, oats, barley, fall rye, singly and in combination were grown under test. Rape proves one of the best annual crops for hogs. Barley and oats sown alone and in combination are cheap and economical pastures for early spring litters. Fall rye sown in combination with oats and barley usually furnishes abundance of late pasture for young fall pigs. However, owing to the dry fall, the rye did not provide the late fall pasture, and consequently, the young fall pigs this year were without pasture of any kind.

COST OF RAISING SPRING LITTERS—FARROWING TO WEANING

It will be observed from the data submitted that ten brood sows farrowed one hundred and thirteen pigs, eighty-two of which were weaned or an average of 8·2 pigs per litter. The average feed cost during the nursing period was $5.94.

COST OF RAISING SPRING LITTERS—FARROWING TO WEANING

Name of sow	Date farrowed	Date weaned	Number of pigs farrowed	Number of pigs weaned	Total cost of feed
					$
Duchess 045	Feb. 18	April 7	9	6	6 06
Indian Head 62	Feb. 20	April 7	10	7	5 90
Duchess 020	Feb. 28	April 11	12	8	5 27
Indian Head 63	Feb. 29	April 11	11	8	5 21
Ottawa A 218	Feb. 27	April 11	9	7	5 43
Ottawa A 217	Feb. 29	April 11	11	7	5 21
Indian Head 80	Feb. 29	April 18	12	9	6 25
Indian Head 81	March 2	April 18	14	9	6 01
Indian Head 79	March 5	April 18	13	11	5 88
Queen 306	April 21	June 20	12	10	8 22
Total			113	82	59 39
Average			11·3	8·2	5 94

COST OF RAISING FALL LITTERS—FARROWING TO WEANING

Comparing the production of spring and fall litters, August and September are usually more favourable for sows to farrow in outside cabins. Generally, the young pigs have an opportunity of securing an abundance of green feed and exercise. The dry fall and lack of late pasture was detrimental to economic production this year. While the average feed costs are approximately the same, it will be noted that the average number of pigs weaned in the fall is slightly less than those weaned in the spring.

COST OF RAISING FALL LITTERS—FARROWING TO WEANING

Name of sow	Mature sows				
	Date farrowed	Date weaned	Number of pigs farrowed	Number of pigs weaned	Total cost of feed
					$
Indian Head 62	Aug. 7	Sept. 26	9	8	6 10
Duchess 020	Aug. 8	Sept. 26	6	4	6 02
Ottawa A 218	Aug. 8	Sept. 26	13	10	6 02
Ottawa A 217	Aug. 11	Sept. 26	13	5	5 80
Total			41	27	23 94
Average			10·25	6·75	5 99

CEREALS

The testing of varieties of the different cereal crops at this farm is carried out to a large extent on one-fortieth acre plots repeated several times. This practice gives an opportunity to measure the performance of the different varieties under soil and climatic conditions which are as nearly alike as possible. Practically all the varieties were harvested before the occurrence of damaging frosts. In addition to these there is a large number of varieties and strains of the different cereal crops being tested in rod-rows, the results of which are not reported here.

In the following tables the yield of the best known variety of the different crops is used as the standard by which to measure the yield of other varieties. This is given the arbitrary value of one hundred per cent while that of the others is graded accordingly.

VARIETY TESTS OF COMMON SPRING WHEAT ON FALLOW

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; Marquis 100 per cent.
	1923	1925	1926	1927	1928	1923	1925	1926	1927	1928	1923	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent.
Early Triumph	.....	.....	.....	.....	100	.....	.....	.....	.....	9·5	.....	.....	.....	.....	45·2	.....
Garnet O. 652	100	107	99	103	93	7·0	8·5	7·0	9·5	7·7	29·0	48·8	57·5	30·0	34·7	96·1
Marquillo	.....	.....	.....	.....	102	.....	.....	.....	.....	10·0	.....	.....	.....	.....	46·3	.....
Marquis O. 15	105	115	109	115	103	7·0	8·0	7·0	9·3	9·0	26·7	45·8	49·2	41·1	45·4	100·0
Marquis 10 B	.....	.....	.....	115	103	.....	.....	.....	9·0	9·8	.....	.....	.....	39·4	44·8	.....
Red Bobs 222	.....	.....	105	106	99	.....	.....	8·0	9·5	8·0	.....	.....	56·7	25·4	43·8	.....
Red Fife O. 17	111	122	116	122	109	7·0	9·0	7·0	9·8	6·7	16·0	41·3	44·6	36·1	37·3	84·2
Renfrew	.....	.....	113	119	108	.....	.....	9·0	9·5	9·8	.....	.....	52·5	41·4	48·8	.....
Reward O. 928	108	105	99	103	94	10·0	9·0	8·0	9·5	9·5	31·3	41·9	45·8	19·1	32·9	82·1
Supreme	.....	114	109	111	102	.....	8·5	8·0	9·0	10·0	.....	39·6	59·6	37·1	47·1	.....
1656-84	.....	.....	.....	.....	102	.....	.....	.....	.....	5·0	.....	.....	.....	.....	42·1	.....

VARIETY TESTS OF COMMON SPRING WHEAT ON STUBBLE

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; Marquis 100 per cent.
	1923	1925	1926	1927	1928	1923	1925	1926	1927	1928	1923	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent.
Early Triumph	.....	.....	.....	.....	100	.....	.....	.....	.....	10	.....	.....	.....	.....	15·3	.....
Garnet O. 652	100	107	99	101	93	7·0	8·0	7·0	9·5	10	22·3	22·1	45·8	21·9	10·8	107·6
Marquillo	.....	.....	.....	.....	101	.....	.....	.....	.....	10	.....	.....	.....	.....	11·7	.....
Marquis O. 15	105	115	108	108	102	7·0	9·0	8·0	9·5	10	25·3	19·2	36·4	21·5	11·8	100·0
Marquis 10 B	.....	.....	.....	108	102	.....	.....	.....	9·5	10	.....	.....	.....	20·8	11·8	.....
Red Bobs 222	.....	.....	105	106	100	.....	.....	8·0	8·5	10	.....	.....	38·8	18·6	12·8	.....
Red Fife O. 17	109	121	115	115	109	7·0	9·8	7·0	9·8	10	21·3	18·8	36·3	22·9	19·3	103·9
Renfrew	.....	.....	113	111	108	.....	.....	8·0	9·8	10	.....	.....	41·7	22·1	16·0	.....
Reward O. 928	103	105	99	101	94	10·0	9·5	8·0	10·0	10	22·7	16·7	32·1	17·3	11·4	87·7
Supreme	.....	112	106	106	101	.....	9·0	8·0	9·0	10	.....	20·0	40·8	23·3	13·9	.....
1656-84	.....	.....	.....	.....	101	.....	.....	.....	.....	10	.....	.....	.....	.....	11·3	.....

These tables covering results for the past five years present data for both fallow and stubble in regard to some varieties which are attracting a good deal of popular attention at the present time. They were all sown on May 5 at the rate of one and three-quarter bushels to the acre on fallow and one and one-half bushels on stubble.

Considering the three varieties Marquis, Reward and Garnet it will be noted that Marquis is wisely considered to be our standard variety when viewed from most standpoints. In the matter of earliness of maturity, however, both Reward and Garnet have an advantage over Marquis, which is a factor of considerable importance under some conditions. The Reward variety usually produces a large uniform plump sample of grain having a high weight per measured bushel and appears to be of excellent milling and baking quality. Without doubt it would appear to hold considerable promise for certain areas as an early maturing good yielding bread wheat.

The Marquillo variety which is shown in the test in 1928 for the first time is the result of a cross between Marquis, a common wheat and Iumillo, a durum wheat. In type it resembles Marquis but possesses a good deal more resistance to stem rust. The flour from this variety, unfortunately, is distinctly yellowish in colour which is an undesirable quality at the present time.

1656-84 is a sister sort to Ceres resulting from a cross between Marquis and Kota. It is tested in the fortieth acre plots during the past season for the first time.

VARIETY TESTS OF DURUM WHEAT ON FALLOW

Variety	Number of days maturing				Strength of straw on scale of 10 points				Yield per acre			
	1925	1926	1927	1928	1925	1926	1927	1928	1925	1926	1927	1928
									bush.	bush.	bush.	bush.
Mindum	118	110	114	108	9·0	6·0	8·5	7·0	39·6	46·3	38·3	41·7
Pelissier	.....	.....	.....	109	.....	.....	.....	7·0	.....	.....	.....	39·2

VARIETY TESTS OF DURUM WHEAT ON STUBBLE

Variety	Number of days maturing				Strength of straw on scale of 10 points				Yield per acre			
	1925	1926	1927	1928	1925	1926	1927	1928	1925	1926	1927	1928
									bush.	bush.	bush.	bush.
Mindum	121	113	110	108	8·8	5·0	8·5	9·0	14·6	36·7	24·6	13·6
Pelissier	.....	.....	.....	109	.....	.....	.....	9·5	.....	.....	.....	13·3

The durum wheats were sown May 5, at the rate of two and one-quarter bushels on fallow and one and three-quarters on stubble.

In the southeastern corner of the province during the past year or two durum wheats have become increasingly popular. Mindum, which is now the variety of durum most commonly grown in Manitoba, appears to be proving satisfactory in this area. Pelissier, a variety of durum having large amber coloured grain, straw coloured glumes and black beards seems to be promising under some conditions. It is included in the test this year for the first time.

VARIETY TESTS OF OATS ON FALLOW

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; Banner 100 per cent.
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent.
Alaska	102	88	89	86	83	7·0	8·0	8·5	9·5	10·0	51·8	62·5	62·5	43·4	72·1	79·3
Abundance	.....	.....	.....	.....	95	.....	.....	.....	.....	10·0	.....	.....	.....	.....	78·2	.....
Banner O. 49	117	103	103	102	97	10·0	9·8	9·5	8·0	10·0	31·4	66·2	90·4	80·1	100·3	100·0
Gerlach	117	106	104	104	96	10·0	9·0	8·5	6·0	9·0	31·6	61·0	95·6	76·3	92·2	96·8
Gopher	.....	.....	.....	.....	85	.....	.....	.....	.....	10·0	.....	.....	.....	.....	80·9	.....
Laurel O. 477	110	92	92	84	92	7·0	8·0	9·5	9·8	10·0	25·1	48·5	110·3	44·1	48·2	75·0
Leader	117	105	103	102	98	10·0	8·5	9·5	8·0	10·0	39·2	58·1	102·2	92·6	95·3	105·2
Longfellow O. 478	112	99	99	97	94	9·0	8·5	9·0	9·5	10·0	26·6	52·2	92·6	95·6	81·6	94·6
Victory	118	103	103	102	97	10·0	9·5	9·5	6·0	9·7	25·9	66·2	108·8	83·1	100·4	104·3
439	.....	.....	.....	.....	99	.....	.....	.....	.....	10·0	.....	.....	.....	.....	92·6	.....

VARIETY TESTS OF OATS ON STUBBLE

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; Banner 100 per cent.
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent.
Alaska	102	93	89	86	83	8·0	8·0	7·5	9·5	10·0	41·3	41·2	50·7	20·6	45·1	78·2
Abundance	.....	.....	.....	.....	95	.....	.....	.....	.....	10·0	.....	.....	.....	.....	40·0	.....
Banner O. 49	115	107	104	100	97	10·0	9·0	9·0	10·0	10·0	27·3	39·0	73·5	63·2	51·2	100·0
Gerlach	117	107	104	104	96	10·0	8·5	8·5	10·0	10·0	20·1	51·5	75·0	37·5	44·6	90·0
Gopher	.....	.....	.....	.....	85	.....	.....	.....	.....	10·0	.....	.....	.....	.....	48·5	.....
Laurel O. 477	114	93	92	96	92	10·0	8·0	9·5	9·8	10·0	27·3	33·8	48·5	15·4	30·9	61·3
Leader	115	107	103	102	98	10·0	8·5	9·5	10·0	10·0	34·7	38·2	80·1	47·1	53·4	99·7
Longfellow O. 478	112	107	99	97	94	10·0	8·5	9·0	9·8	10·0	24·4	36·0	69·9	50·0	42·6	87·7
Victory	117	107	104	102	97	10·0	9·0	8·5	10·0	10·0	22·3	54·4	96·3	30·1	52·6	100·6
439	.....	.....	.....	.....	99	.....	.....	.....	.....	10·0	.....	.....	.....	.....	51·5	.....

These varieties were sown May 15 at the rate of two and one-half bushels to the acre. The results indicate that the Banner and Victory varieties are still the best for most purposes. Alaska and Gopher are both early varieties that may be recommended where an early oat is desired. Gopher oats have only been under test at this farm during the past year but their past performances elsewhere have as a rule been satisfactory. It should be noted that the earlier varieties of oats do not yield nearly as well as the later maturing sorts. Where a hulless oat is required Laurel, or Liberty, which is not reported here, should give satisfaction.

VARIETY TESTS OF BARLEY ON FALLOW

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; A.O.C. 21 100 per cent
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent
Bearer	115	101	97	96	90	9·0	7·0	8·0	9·0	8·2	27·5	32·8	64·6	52·6	61·8	107·5
Canadian Thorpe	.....	.....	.....	.....	96	.....	.....	.....	.....	10·0	.....	.....	.....	.....	39·6	.....
Chinese	112	93	90	90	88	10·0	8·0	8·5	9·5	8·5	27·0	40·6	55·7	50·5	53·6	102·2
Colsess	.....	.....	.....	.....	86	.....	.....	.....	.....	9·5	.....	.....	.....	.....	54·7	.....
Duckbill	119	106	98	102	95	10·0	10·0	9·5	9·5	10·0	22·4	24·0	51·0	49·0	41·5	84·4
Gold	.....	.....	97	102	92	.....	.....	8·0	6·5	8·8	.....	.....	63·0	54·2	47·9	.....
Hannchen	.....	.....	.....	96	89	.....	.....	.....	6·5	8·0	.....	.....	.....	52·1	48·1	.....
O.A.C. 21	112	93	89	90	88	10·0	8·0	8·5	9·5	8·3	27·8	41·7	57·3	44·8	51·0	100·0
Trebi	.....	.....	.....	.....	89	.....	.....	.....	.....	5·5	.....	.....	.....	.....	72·2	.....

VARIETY TESTS OF BARLEY ON STUBBLE

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; O.A.C. 21 100 per cent
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent.
Bearer	117	117	100	96	94	10·0	8·5	8·5	9·0	9·3	25·5	35·4	44·8	45·8	55·2	120·1
Canadian Thorpe	.....	.....	.....	.....	96	.....	.....	.....	.....	10·0	.....	.....	.....	.....	41·7	.....
Chinese	112	107	91	90	90	10·0	9·0	8·5	9·8	8·8	28·8	27·6	52·1	33·3	47·6	109·8
Colsess	.....	.....	.....	.....	87	.....	.....	.....	.....	10·0	.....	.....	.....	.....	42·7	.....
Duckbill	119	117	100	102	95	10·0	9·0	9·5	10·0	10·0	21·9	19·3	38·0	28·1	34·2	82·5
Gold	.....	.....	102	98	96	.....	.....	8·0	9·0	8·3	.....	.....	47·4	21·9	53·3	.....
Hannchen	.....	.....	.....	96	91	.....	.....	.....	9·8	9·0	.....	.....	.....	32·8	44·1	.....
O.A.C. 21	112	107	89	90	91	10·0	9·0	8·5	9·8	8·7	28·2	22·4	50·0	23·4	48·1	100·0
Trebi	.....	.....	.....	.....	94	.....	.....	.....	.....	8·5	.....	.....	.....	.....	65·1	.....

The varieties in the foregoing tables were sown May 19 at the rate of one and three-quarter bushels to the acre.

O.A.C. No. 21 and Chinese, both six-rowed varieties, again demonstrate their early maturing, high-yielding qualities. They are among the best of our malting barleys and do well under a fairly wide range of soil and climatic conditions.

Bearer is a consistently heavy yielder under our conditions here. It is a white six-rowed sort, somewhat later in maturity, and a little weaker in the straw than O.A.C. No. 21.

Trebi is a six-rowed barley which lately has been attracting some attention. It has been under test at this farm only during the past season where it has outyielded all the other varieties.

VARIETY TESTS OF FLAX ON FALLOW

Variety	Number of days maturing					Strength of straw on scale of 10 points					Yield per acre					Relative yield; Premost 100 per cent
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent.
Crown-Sask. 272	99	107	113	100	104	10	9	10	10	10	13·6	12·5	12·3	23·7	19·2	105·9
Linota	.....	.....	.....	.....	103	.....	.....	.....	.....	10	.....	.....	.....	.....	17·9	.....
Longstem O. 52	100	107	107	100	103	10	9	10	10	9	13·1	7·6	9·9	18·3	15·2	83·8
Novelty O. 53	99	107	113	101	102	10	9	10	10	10	18·3	11·4	12·5	21·0	19·6	107·8
Premost	96	99	100	93	95	10	9	10	10	10	20·5	8·9	9·8	21·5	16·1	100·0

These varieties were sown May 17 on single plots only.

Over the five-year period shown, the Crown and Novelty varieties somewhat outyielded Premost, which we use as our standard. It should be noted that Longstem is longer in the straw than the other varieties reported, being more suitable for fibre.

MARQUIS WHEAT AND PREMOST FLAX IN COMBINATION

Variety	Rate of seeding		Days to mature		Height at harvest in inches		Yield per acre	
	Wheat	Flax	Wheat	Flax	Wheat	Flax	Wheat	Flax
	bush.	bush.					bush. lb.	bush. lb.
Wheat and Flax	¼	½	107	107	47·0	26·5	21 40	9 46
Wheat and Flax	¼	¾	107	107	47·8	28·0	28 20	8 02
Wheat and Flax	½	½	106	106	47·0	27·3	30 ..	6 24
Wheat and Flax	½	¾	106	107	46·0	26·5	25 20	8 27
Wheat and Flax	¾	½	107	107	44·5	25·0	26 50	7 13
Wheat and Flax	¾	¾	107	107	47·5	24·5	33 40	4 46
Wheat and Flax	1	½	107	107	44·3	24·3	28 40	7 08
Wheat and Flax	1	¾	107	107	43·8	24·5	30 50	6 04
Wheat and Flax	1¼	½	105	107	45·8	24·5	35 40	5 00
Wheat and Flax	1¼	¾	105	107	47·0	26·5	37 40	4 06
Wheat and Flax	1½	½	103	106	49·0	27·5	42 20	2 48
Wheat and Flax	1½	¾	105	106	49·0	26·5	41 00	3 52
Wheat (alone)	1½	.....	105	.....	50·0	.....	43 30	.. ..
Flax (alone)	.....	½	.....	106	.....	28·5	.. ..	16 04
Flax (alone)	.....	¾	.....	107	.....	27·8	.. ..	15 40

A combination crop of wheat and flax was sown on May 7. Tests were made at different rates of seeding as shown. The wheat was first sown with the ordinary drill at the normal depth of seeding, after which the flax was placed in the ground at about one inch to one inch and a half deep. The results are presented in the above table. They are by no means conclusive as they are for one year only. Attention should be drawn to the fact that, on the whole, there was little difference between the wheat and the flax in time of maturity.

VARIETY TESTS OF FIELD PEAS ON FALLOW

Variety	Number of days maturing					Length of vine in inches.					Yield per acre					Relative yield; Mackay 100 per cent.
	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	1924	1925	1926	1927	1928	
											bush.	bush.	bush.	bush.	bush.	per cent
Arthur O. 18	121	112	101	109	110	27	36	35	18·2	44·8	22·7	29·6	36·4	40·1	42·6	78·1
Cartier O. 19	118	115	102	113	109	25	34	40	24·8	45·4	16·7	20·0	37·8	50·2	56·0	82·8
Champlain O. 32	118	112	103	115	109	24	30	43	26·2	46·6	18·0	42·5	35·7	63·8	44·4	93·1
Chancellor O. 26	105	104	96	105	104	19	34	37	19·4	44·0	17·3	39·1	32·2	47·4	48·5	84·0
Golden Vine	122	112	103	116	109	22	39	44	26·4	46·6	12·3	42·5	35·0	65·1	47·5	92·2
Mackay O. 25	102	115	106	115	112	23	37	48	27·8	48·4	16·0	37·5	46·9	63·1	56·1	100·0
Dashaway-Sask.625	.....	.....	96	105	104	.....	.....	37	19·8	44·8	.....	.....	31·5	50·9	50·5	.....

The variety plots of field peas were sown on fallow May 17. The rate of seeding varied according to the size of the seed. The results show that Mackay, our standard variety, has outyielded all the other varieties over a period of years. It should be noted that it is one of the later maturing sorts.

FIELD HUSBANDRY

CULTURAL EXPERIMENTS

The average results for the past five years of experiments at this farm dealing with some methods of preparing land for crops are presented under this heading. Approximately four hundred and fifty plots each containing one-fortieth of an acre in area are used. They are arranged in rotations to accommodate the different treatments which include the summer-fallow, stubble treatments, break-

ing, rates, dates and methods of seeding, manures and fertilizers. The tests are carried out on a heavy clay soil and the average annual precipitation is approximately nineteen inches.

Project M. 144 SUMMER-FALLOW TREATMENTS

Plot treatment	Average yield per acre 1924-28 wheat	
	bush.	lb.
Ploughed 6 inches June 15 and cultivated as necessary	42	34
Fall ploughed 6 inches and cultivated during summer-fallow year	43	55
Fall disked before summer-fallow and cultivated as necessary during summer-fallow year, but not ploughed	44	03
Cultivated during summer-fallow year, but not ploughed	43	08
Ploughed 6 inches June 15 and cultivated as necessary	41	39

Project F 144 is a comparison of the effect of four different methods of handling the summer-fallow on the following wheat crop. The plots are laid out for a three-year rotation, summer-fallow, wheat, oats. The percentage of moisture in the soil at various depths to four feet is determined for the different treatments. There was little or no weed growth on any of the plots. The results to date show no marked difference on the yields of grain or the percentages of soil moisture to the depth of four feet for the methods used.

Project F. 145 SUMMER-FALLOW SUBSTITUTES

Plot treatment	Average yield per acre—1924-28					
	Yield of substitute		Wheat 2nd year		Oats 3rd year	
	tons	lb.	bush.	lb.	bush.	lb.
Summer-fallow—ploughed 6 inches early in June	..	..	37	40	66	07
Corn in rows 36 inches apart	5	1,296	24	59	42	04
Sunflowers in rows 36 inches apart	12	1,280	18	46	39	23
	bush.					
Potatoes in rows 36 inches apart	127	20	25	16	38	17
Oats in two drill rows 36 inches apart	29	14	22	31	38	14
Oats in three drill rows 36 inches apart	33	02	27	03	44	26
Summer-fallow ploughed 6 inches early in June	..	..	36	18	57	31
	tons					
Oats in two drill rows 36 inches apart and cut for green feed	1	644	28	14	51	15
Oats sown ordinary way for green feed, July 1st (2½ bushels per acre)	*1	1,635	22	21	49	08
	bush.					
Oats sown ordinary way (1 bushel per acre)	49	18	24	10	46	17
Summer-fallow ploughed 6 inches early in June	..	..	37	20	65	15
Wheat in two drill rows 36 inches apart	20	40	28	10	58	13
Wheat in three drill rows 36 inches apart	18	..	25	56	47	18
Wheat sown ordinary way (¾ bushel per acre)	20	28	20	42	45	18
Barley in two drill rows 36 inches apart	24	40	31	31	59	24
Summer-fallow ploughed 6 inches early in June	..	..	38	59	69	..
Barley in three drill rows 36 inches apart	20	32	27	32	49	33
Hubam Sweet Clover in two drill rows 36 inches apart	*1	551	30	59	51	02
	tons					
Millet in two drill rows 36 inches apart	1	1,392	35	04	66	26
Summer-fallow ploughed 6 inches early in June	..	..	43	05	80	04

*Average yield of substitute is for four years only.

The purpose of project F 145 is to compare the bare summer-fallow as ordinarily practised, with a number of different crops used as a substitute, as a preparation for the following crops.

The data presented in the above table point to the fact that, taken over the comparatively short period of time the test has been in operation, the average yields of the crops following summer-fallow compare favourably with those of the substitutes. This is also true of the moisture content of the upper four feet of the soil determined in the fall after the crops have been harvested. With regard to the substitutes, corn is more satisfactory than sunflowers although the sunflowers yield a much heavier tonnage in the substitute year. The plots containing wheat after grain in rows have generally been more weedy and less uniform in height and maturity than the others. It is interesting to note that millet in two-drill rows seemed a very satisfactory substitute. Of course, in interpreting data of this kind practical considerations must not be overlooked, such as the reason why a substitute is required and its economic value when harvested.

STUBBLE TREATMENT FOR WHEAT

Project F. 146A

Plot treatment	Average yield per acre 1924-28	
	bush.	lb.
Stubble ploughed in spring	37	43
Stubble ploughed in fall	40	28
Stubble burned in spring—seeded without cultivating	38	11
Stubble burned in spring—cultivated and seeded	40	41
Stubble ploughed in spring	38	30
Stubble disked in spring and seeded	34	19

Project F 146A includes five methods of treating wheat stubble for wheat. This year the fall ploughing shows up somewhat better than the spring ploughing. In other years they have been about equal. Perhaps the fact that this year the stand on the fall ploughed plot was more uniform and thicker than on the spring-ploughed plot may have accounted for the increase. Fall ploughing has the advantage of saving time in the spring. As already reported, burning stubble in spring does not appear to produce any advantage, but the cultivator seems to be better than the disk for spring preparation of land for wheat.

STUBBLE TREATMENT FOR OATS

Project F. 146B

Plot treatment	Average yield per acre 1924-28	
	bush.	lb.
Stubble ploughed in spring	57	24
Stubble ploughed in fall	65	00
Stubble burned in spring—seeded without cultivating	63	30
Stubble burned in spring—cultivated and seeded	68	27
Stubble ploughed in spring	62	13
Stubble disked in spring and seeded	59	15

The stubble treatments described for wheat have been duplicated for oats, the results of which are shown in project 146 B. It is interesting to note that fall ploughing appears to advantage when compared with spring ploughing, while the use of the cultivator where the stubble has been burned in the spring would appear to be better than no cultivation.

METHODS OF BREAKING BROME SOD

Project F. 147

Plot treatment	Average yield per acre, 1924–28					
	Hay treatment year		Wheat		Oats	
	tons	lb.	bush.	lb.	bush.	lb.
Sod ploughed 5 inches deep immediately after hay crop was removed; disked and worked as required	1	1,936	20	43	48	04
Sod ploughed 5 inches deep immediately after hay crop was removed; disked and worked as required and backsetted Sept. 15	1	1,425	22	29	52	12
Sod ploughed 5 inches deep early in spring and summer-fallowed throughout the year	.....		35	05	56	08

Project F. 147 covers three methods of breaking brome grass sod. In two of them a crop of hay is first removed after which the land is broken. In the remaining method the plots are ploughed early in spring and treated as summer-fallow throughout the season. Results indicate that the latter is the more effective way to destroy the brome, except in a dry season, and is followed by a higher yield of grain. However, the two former methods produce, in each case, a crop of brome, the value of which must be taken into consideration when comparing results.

PLACE IN ROTATION TO SEED FALL RYE

Project F. 163

Method of seeding fall rye	Average yield per acre 1924–28	
	bush.	lb.
Seeded on summer-fallow August 15	41	44
Seeded with wheat in spring	18	12
Seeded on disked wheat stubble	34	02
Seeded with oats in spring	17	32
Seeded on summer-fallow August 15	38	14
Seeded on disked oat stubble	30	03
Seeded with oats for green feed June 21	25	27
Seeded when oats are 4 inches high	21	11
Seeded on summer-fallow August 15	32	52

The results presented in the foregoing table favour seeding fall rye either on summer-fallow or on disked wheat stubble. This latter method has been tried lately by many farmers with good results.

DATES OF SEEDING SUNFLOWERS

Project F. 156

Date seeded	Average yield per acre 1924–28					
	Sunflowers		Wheat		Oats	
	tons	lb.	bush.	lb.	bush.	lb.
Seeded May 1	19	888	29	28	63	32
Seeded May 7	16	1,040	27	09	59	18
Seeded May 14	16	240	26	21	59	00
Seeded May 21	16	1,984	26	48	65	29
Seeded May 28	16	1,640	25	55	59	08
Seeded June 4	16	280	27	28	57	01
Seeded June 11	15	1,088	27	03	57	29
Seeded June 18	13	1,520	26	15	58	11

Project F. 156 deals with dates of sowing sunflowers in a three-year rotation. It would appear from the results obtained over the five-year period that

sunflowers may conveniently be sown at any time in May or early June with satisfactory results. It should be mentioned that this year's crop of wheat following sunflowers was largely piebald.

DATES OF SEEDING FALL RYE

Project F. 157

Date seeded	Average yield per acre, 1924-28			
	Rye		Oats	
	bush	lb.	bush.	lb.
Seeded July 1	22	50	77	4
Seeded July 15	26	51	69	12
Seeded August 1	28	45	68	20
Seeded August 15	29	34	68	20
Seeded September 1	35	50	69	14
Seeded September 15	37	33	70	13
Seeded October 1	34	26	66	5
Seeded October 15	34	22	63	19

Project F. 157 covers dates of seeding fall rye, considering all factors, the results obtained over the five year period tend to favour seedings between August 15 and September 15. Seedings during this period generally produce a taller growth and heavier yield of straw.

METHODS OF SEEDING DOWN ALFALFA AND WESTERN RYE

Project F. 169A

Method of seeding down	Average yield per acre, 1924-28			
	Hay first year		Hay second year	
	tons	lb.	tons	lb.
Seeded with wheat first crop after summer-fallow	1	1,840	2	1,301
Seeded with wheat second crop after summer-fallow	*2	755	2	1,171
Seeded with oats second crop after summer-fallow	2	435	2	542
Seeded with barley second crop after summer-fallow	2	846	2	600
Seeded with green feed oats second crop after summer-fallow	2	775	2	805
Seeded in spring on fall rye first crop after summer-fallow	2	59	2	1,418
Seeded in fall with fall rye first crop after summer-fallow	*1	994	*2	695
Seeded alone after summer-fallow wheat	3	1,081	2	1,502
Seeded with oats first crop after summer-fallow	2	686	2	1,427

*Four-year average only.

Different methods of seeding down a hay or pasture mixture, both with and without a nurse-crop, are treated in project F. 169A. The mixture is sown at the rate of ten pounds of alfalfa and eight pounds of western rye grass to the acre. Wheat, oats, barley and fall rye are used as nurse-crop. Seeding alone without a nurse-crop has given the highest yields. However, this is not always the most convenient method nor does it compensate for the loss of the nurse-crop in the average year. It is interesting to note that wheat, oats or barley make satisfactory nurse-crops, while fall rye sown in the fall is not so suitable, as the yields of hay secured following this method have usually been rather low and sometimes resulted in a complete failure to obtain a stand. A good crop of hay has been secured by seeding down with second crop grain after summer-fallow.

Project F. 179 CULTURAL METHODS FOR SUNFLOWERS

Cultural method	Average yield per acre, 1924–28					
	Sunflowers		Wheat		Oats	
	tons	lb.	bush.	lb.	bush.	lb.
Seeded on spring-ploughed ground, in rows 36 inches apart	17	200	27	42	54	30
Seeded on fall-ploughed ground, in rows 36 inches apart	17	400	24	43	55	21
Seeded on fall-ploughed ground, in rows 36 inches apart; plants thinned to 3 inches apart in rows	17	1,152	25	9	53	32
Seeded on fall-ploughed ground, in rows 36 inches apart; plants thinned to 6 inches apart in rows	16	344	24	40	54	6
Seeded on fall-ploughed ground, in rows 36 inches apart; plants thinned to 10 inches apart in rows	15	872	24	22	52	15
Seeded on fall-ploughed ground, in rows 42 inches apart; plants thinned to 6 inches apart in rows	13	1,912	24	20	50	1
Seeded on fall-ploughed ground, in rows 30 inches apart; plants thinned to 6 inches apart in rows	15	1,320	23	1	53	4
Seeded on fall-ploughed ground, in rows 36 inches apart; plants thinned to 6 inches apart in rows; cultivated 6 times	14	816	23	37	50	13
Seeded on fall-ploughed ground, in rows 36 inches apart; plants thinned to 6 inches in rows. Harrowed when coming up. Not cultivated	14	224	22	39	50	10
Seeded on summer-fallow, in rows 36 inches apart; plants thinned to 6 inches in rows	16	912	26	58	..	..

This project deals with various cultural methods for sunflowers. The data presented in the table are self-explanatory. It should be noted that thinning does not appear to pay for the labour involved.

Project F. 189 APPLYING BARNYARD MANURE FOR WHEAT

Plot treatment	Average yield per acre, 1924–28			
	Wheat on fallow		Wheat second year	
	bush.	lb.	bush.	lb.
No manure, stubble ploughed in fall	38	7	24	44
8 tons rotted manure spread on summer-fallow and ploughed in	43	21	27	34
8 tons rotted manure spread on first year stubble and ploughed in	36	55	29	02
Second year grain top-dressed with 8 tons of rotted manure immediately after seeding	41	25	25	10
No manure, stubble ploughed in fall	37	31	24	46

Project F. 189 deals with the application of barnyard manure for wheat on a three year rotation of summer-fallow, wheat and wheat. The results to date do not show any benefit from manuring first year stubble. Top-dressing second year grain after seeding appears to have given some increase in yield, while ploughing in manure with the summer-fallow has given best results of all.

Project F. 192 APPLYING BARNYARD MANURE FOR CORN

Plot treatment	Average yield per acre 1924–28					
	Corn		Wheat		*Oats	
	tons	lb.	bush.	lb.	bush.	lb.
Oat stubble ploughed in fall; no manure	10	992	36	00	61	26
8 tons rotted manure spread on oat stubble and fall-ploughed	9	1,304	33	11	55	33
Oat stuuble fall-ploughed; 8 tons rotted manure applied after freeze-up; disked in spring	10	1,800	31	40	55	16
8 tons rotted manure applied in spring and ploughed in	10	416	32	11	57	23
Oat stubble ploughed in fall; no manure	9	24	30	7	59	27
16 tons rotted manure spread on oat stubble and fall-ploughed	12	192	34	46	61	15
16 tons rotted manure applied in spring and ploughed in	10	1,608	*34	15	52	25
Oat stubble ploughed in fall; corn top-dressed with 8 tons rotted manure immediately after seeding	10	1,072	*32	57	49	9

*Four-year average only.

The effect of applying barnyard manure for corn is tried out in several ways in project F. 192. The results to date would appear to indicate that the advantages following the applications of manure for corn are not yet sufficiently pronounced to warrant drawing definite conclusions.

COMMERCIAL FERTILIZERS FOR WHEAT

Project F. 193

Plot treatment	Average yield per acre, 1924-28			
	Wheat		Wheat	
	bush.	lb.	bush.	lb.
12 tons rotted manure applied previous to seeding stubble wheat	41	21	35	49
Complete fertilizer applied for summer-fallow wheat	44	12	32	30
One hundred pounds nitrate of soda applied previous to seeding stubble wheat	39	24	31	25
No manure	39	47	32	25
Three hundred pounds superphosphate applied previous to seeding stubble wheat	38	58	32	47
One hundred pounds muriate of potash applied previous to seeding stubble wheat	36	42	28	51
Complete fertilizer, applied previous to seeding stubble wheat	37	12	29	29

It is interesting to compare the effects of commercial fertilizers, barnyard manure and no manure. This is done in project F. 193 and the average yields for the past five years are shown in the foregoing table. The plots receiving the complete fertilizer have given the best yields, but these can hardly be considered significant when compared with the yields of the plots receiving no manure, taking into account the cost of the fertilizer. However, those receiving the complete fertilizer, applied for summer-fallow wheat, matured from four to six days ahead of the other plots in the test.

GREEN MANURE

Project F. 194

Plot treatment	Average yield per acre, 1924-28			
	Wheat		Oats	
	bush.	lb.	bush.	lb.
Summer-fallow; ploughed 6 inches in June	37	22	53	21
Peas (2 bush. Chancellor) ploughed under early in July	40	58	62	2
Peas (2 bush. Chancellor) ploughed under late in July	37	30	58	16
Vetches (1 bush. common) ploughed under late in July	38	44	54	2
Summer-fallow; 12 tons barnyard manure ploughed in	38	47	49	29
Summer-fallow; ploughed 6 inches early in June	30	19	41	10

Project F. 194 is designed to test the effect of ploughing down a green manure crop in the summer-fallow. The results are presented in the above table. In view of the fact that a similar experiment conducted some time ago failed to show any advantage from the ploughing down of peas or vetches, these results should be interpreted with caution.

ROTATIONS

Four cropping systems have been under way for the past seventeen years. These systems were designed to meet the requirements of the grain and diversified farmer. In addition they provide a study in crop sequence, soil fertility and cost of production. The following crops are used exclusively in these rotations:—

Marquis wheat, Banner oats, O.A.C. 21 barley, Early Northwestern Dent corn, alfalfa and western rye grass.

ROTATION "C"

Rotation "C" which is three years duration, carries the usual grain crop, namely, fallow, wheat, wheat. This system is conducive to soil drifting and weed growth.

ROTATION "C"—SUMMARY OF COST OF PRODUCTION

Rotation year	Crop	Yield per acre		Value of crop per acre, 1928	Cost of production, 1928	Profit per acre	
		1928	Average five years			1928	Average five years
		bush.	bush.	$	$	$	$
1	Wheat	19·5	20·8	24 37	16 85	7 52	8 82
2	Summer-fallow						
3	Wheat	32·7	29·1	40 87	20 03	20 84	17 02
	Totals for rotation			65 24	36 88	28 36	25 84
	Average per acre			21 75	12 29	9 45	8 61

ROTATION "P"

Rotation "P" eight year duration, carries a cash wheat crop, coarse grains for feed or sale, forage crops and pasture. This is an ideal rotation for live stock work, flexible in construction and may be reduced to five or six years as required to meet special conditions.

ROTATION "P"—SUMMARY OF COST OF PRODUCTION

Rotation year	Crop	Yield per acre		Value of crop per acre, 1928	Cost of production, 1928	Profit or loss per acre	
		1928	Average five years			1928	Average five years
		bush.	bush.	$	$	$	$
1	Wheat	47·4	32·5	59 25	17 31	41 94	21 26
2	Oats	80·05	58·39	43 28	20 31	22 97	11 34
3	Corn	tons 6·52	tons 7·61	26 08	27 33	−1 75	−1 87
4	Barley (seeded down)	bush. 43·7	bush. 39·2	28 32	16 81	11 51	9 53
5	Hay	tons 1·81	tons 1·77	21 72	13 54	8 18	7 69
6	Hay	1·91	1·54	22 92	13 85	9 07	6 03
7	Hay	2·09	1·38	25 08	14 41	10 67	5 56
8	Hay and break	1·63	1·79	19 56	18 20	1 36	1 18
	Totals for rotation			246 21	142 26	103 95	60 72
	Average per acre			30 78	17 76	12 99	7 59

ROTATION "R"

Rotation "R" is of nine years' duration and by many farmers may be considered somewhat long under our present farming conditions. It is an excellent live stock rotation. The inclusion of legumes, manure and fallow tends to control weeds and build up the texture and fertility of the soil.

ROTATION "R"—SUMMARY OF COST OF PRODUCTION

Rotation year	Crop	Yield per acre		Value of crop per acre, 1928	Cost of production, 1928	Profit or loss per acre	
		1928	Average five years			1928	Average five years
		tons	tons	$	$	$	$
1	Hay and break	1·93	1·28	23 16	19 45	3 71	−0 26
2	Corn	8·97	7·9	35 88	30 64	5 25	−5 03
		bush.	bush.				
3	Wheat	30·9	40·5	38 62	15 47	23 15	26 23
4	Oats	79·4	58·4	46 12	20 48	25 64	13 52
5	Fallow						
6	Wheat	43·0	40·3	53 75	23 27	30 48	25 27
7	Oats (seeded down)	68·7	55·5	38 85	22 73	16 12	8 92
		tons	tons				
8	Hay	1·81	1·4	21 72	13 84	7 88	4 53
	Hay	2·26	1·64	27 12	15 25	11 87	5 94
	Totals for rotation			285 22	161 13	124 09	79 42
	Average per acre			31 69	17 90	13 79	8 82

ROTATION "J"

Rotation "J" carries a six-year crop sequence. Specially intended for live stock work. This rotation is not giving the desired results. In 1925 the oat field had to be cut for green feed, and again in 1926 the hay block was a total failure. In 1928, however, excellent crops were obtained with the exception of corn which only yielded 3·42 tons per acre.

ROTATION "J"—SUMMARY OF COST OF PRODUCTION

Rotation year	Crop	Yield per acre		Value of crop per acre, 1928	Cost of production, 1928	Profit or loss per acre	
		1928	Average five years			1928	Average five years
		bush.	bush.	$	$	$	$
1	Wheat (seeded down)	37·2	32·1	46 50	16 60	29 90	24 01
		tons	tons				
2	Hay	1·02	1·02	12 24	13 77	−1 53	0 45
3	Hay (manure and break)	1·55	1·37	18 60	19 38	−0 78	0 00
		bush.	bush.				
4	Wheat	51·9	30·8	64 87	18 45	46 42	18 85
5	Oats	62·8	46·3	36 64	20 11	16 53	12 60
		tons	tons				
6	Corn	3·42	5·37	13 68	24 29	−10 61	−5 33
	Totals for rotation			192 53	112 60	79 93	50 58
	Average per acre			32 09	18 77	13 32	8 43

FORAGE CROPS

During the past season the heavy precipitation in June favoured the growth of forage crops and the yields were on the whole, satisfactory. Grasses and clovers for the most part came through the winter in good shape with comparatively little injury from winter killing.

Project Ag. 1

ENSILAGE CORN VARIETIES

Variety	Source of seed	Height	Maturity at harvest	Yield per acre 1928	
				Green weight	Dry matter
		in.		tons lb.	tons lb.
Longfellow	Popp & Lang	54·2	Cobs starting	9 1,300	1 859
North Dakota	Steele, Briggs	54·5	No cobs	9 880	1 802
Compton's Early	J. O. Duke	54·8	No cobs	8 1,080	1 655
Longfellow	J. O. Duke	55·3	No cobs	8 1,480	1 639
Hybrid	Wimple	60·6	Cobs starting	7 1,580	1 543
Northwestern Dent (Red)	Dakota Improved Seed Co.	58·7	Cobs forming	7 1,300	1 523
Wisconsin No. 7	J. O. Duke	58·1	No cobs	8	1 521
White Cap Yellow Dent	Steele, Briggs	60·8	No cobs	8 120	1 394
Burr Leaming	G. S. Carter	58·8	No cobs	8 1,200	1 386
Leaming	J. O. Duke	59·0	No cobs	7 100	1 384
Minnesota 13	A. E. McKenzie Seed Co., Brandon	55·4	No cobs	8 400	1 382
Falconer	A. E. McKenzie Seed Co., Brandon	62·2	Late milk	7 780	1 369
Yellow Dent	Wimple	58·9	No cobs	7 1,140	1 366
Northwestern Dent	A. E. McKenzie Seed Co., Brandon	64·0	Cobs forming	6 1,820	1 355
Golden Glow	J. O. Duke	58·9	No cobs	7 500	1 207
Amber Flint	Wimple	59·8	Cobs formed	7 180	1 194
Bailey	J. O. Duke	60·5	Cobs starting	6 1,960	1 145
Northwestern Dent	Experimental Farm, Brandon	56·6	Late milk	5 1,920	1 45
Quebec 28	Macdonald College	62·9	Cobs forming	5 1,560	.. 1,927

Project IA

ENSILAGE CORN VARIETIES—SIX-YEAR AVERAGE

Variety	Source of seed	Average height	Average yield per acre 1923–28		Relative yield dry matter, per acre
			Green weight	Dry matter	
		in.	tons lb.	tons lb.	%
Northwestern Dent	A. E. McKenzie	64·0	10 1,356	1 1,964	100·0
Wisconsin No. 7	J. O. Duke	72·2	10 1,820	1 1,387	85·4
North Dakota	Steele, Briggs	66·2	10 1,693	1 1,385	85·4
Leaming	J. O. Duke	71·9	9 1,916	1 1,377	85·2
White Cap Yellow Dent	Steele, Briggs	74·7	9 1,141	1 1,337	84·2
Golden Glow	J. O. Duke	71·9	9 1,117	1 1,301	83·3
Longfellow	J. O. Duke	68·6	10 1,404	1 1,272	82·5
Compton's Early	J. O. Duke	69·1	10 1,509	1 1,253	82·1

The ensilage corn varieties were not as mature as desired when harvested. Frost in August interfered with their development reducing their yield and value for ensilage. It will be observed that Northwestern Dent heads the list in the average yields from 1923 to 1928. This variety has given general satisfaction as an ensilage corn under our conditions.

MANGELS

Project Ag. 16

Type of root	Variety	Source of seed	Average yield per acre, 1926–28			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Intermediate	Rosted Barres	Hjalmar Hartmann Co., Copenhagen	12	1,954	1	671
Intermediate	Yellow Intermediate	Central Experimental Farm, Ottawa	11	375	1	656
Half Long	Giant White Feeding Sugar	Steele, Briggs	10	1,785	1	589
Half Long	Green Top Half Sugar	Hjalmar Hartmann Co., Copenhagen	11	178	1	401
Long	Giant Long Red	A. E. McKenzie Seed Co., Brandon	10	1,974	1	278
Tankard	Eckendorfer	Hjalmar Hartmann Co., Copenhagen	13	615	1	277
Tankard	Eclipse	A. E. McKenzie Seed Co., Brandon	11	880	1	189
Globe	Giant Yellow Globe	Steele, Briggs	12	1,535	1	98
Long	Elevetham Mammoth	Hjalmar Hartmann Co., Copenhagen	9	491	1	67
Globe	Golden Globe	Sutton, England	9	1,918	1	10

Project Ag. 16 covers a test of several different types of mangels. These are long, half-long, intermediate, tankard and globe. The average results cover a period of only three years but to date these favour the intermediate type, which, it so happens, is one of the easiest to harvest.

FIELD CARROTS

Project Ag. 36

Type of root	Variety	Source of seed	Average yield per acre, 1926–28		
			Green weight		Dry matter
			tons	lb.	lb.
Long	Long Red Surrey	Steele, Briggs	6	839	1,513
Intermediate	Danish Champion	Central Experimental Farm, Ottawa, Ont	6	1,063	1,447
Short	Improved Short White	Steele, Briggs	7	1,704	1,402
Intermediate	Champion	Hjalmar Hartmann, Copenhagen	6	1,098	1,399
Short	Oxheart	H. McFayden, Winnipeg, Man	6	1,423	1,385
Long	Long Orange Belgian	A. E. McKenzie Seed Co., Brandon, Man	4	1,355	1,114

Types are also used as a basis for testing field carrots and average results for three years are shown in table Ag 36. The Long Red Surrey was easier to harvest than the Long Orange Belgian while the Oxheart was easier than the Improved Short White. From the standpoint of ease of harvesting the intermediate type would in all probability meet with general favour.

SWEDE TURNIPS

Project Ag. 51

Type	Variety	Source of seed	Average yield per acre, 1926–28			
			Green weight		Dry matter	
			tons	lb.	tons	lb.
Globe	Ditmars	H. H. McNutt	11	1,877	1	305
Globe	Invicta Bronze Top	Wm. Rennie	9	1,643	1	26
Oval	Improved Jumbo	Wm. Rennie	8	1,703	..	1,798
Oval	Monarch	A. E. McKenzie	8	974	..	1,787
*Globe	Bangholm	Experimental Farm, Kentville	10	840	1	536
*Globe	Bangholm	Experimental Farm, Nappan	9	1,560	1	419

*Average 1927 and 1928 only.

Project Ag. 1 deals with a test of types of swede turnips rather than with a test of varieties. The average results to date tend to indicate that from the standpoint of yield, the globe type is superior to the oval.

SUGAR BEETS

Project Ag. 66

Variety	Per cent sugar in juice	Per cent co-efficient of purity	Green weight per acre		Dry matter per acre	
			tons	lb.	tons	lb.
Frederiksen	20·99	84·87	8	1,960	2	114
Dippe	21·66	85·78	7	720	1	1,294
Buszczynski	20·90	84·45	6	1,480	1	1,180

The growing of sugar beets at this farm is carried out in co-operation with the Division of Chemistry at Ottawa, who make chemical analyses of the roots. As a rule, under conditions at this farm, the yield of sugar beets is small and the percentage of sugar in the juice is low. As far as yield is concerned, results from the past season's work were no better than usual but the percentage of sugar in the juice is high, due probably, to the small size of the root and the prolonged period of dry weather previous to harvesting.

SUNFLOWER VARIETIES

Project Ag. 76.

Variety	Source of seed	Height	Maturity at harvest	Yield per acre 1928			
				Green weight		Dry matter	
		in.		tons	lb.	tons	lb.
Mammoth Russian	K. McDonald	100·0	Heads forming	24	500	3	868
Ottawa 76	Central Experimental Farm, Ottawa	89·5	Early milk	18	380	2	1,591
Manchurian	A. E. McKenzie Seed Co.	87·0	Early milk	15	280	2	1,146
Mennonite	Experimental Station, Rosthern	69·5	Early dough	13	1,920	2	506

Sunflowers gave a good growth during the past season. Of the varieties under test the Mammoth Russian has given the best yield but does not mature as rapidly as the others and usually contains a comparatively high percentage of moisture at harvest time. The Mennonite is a low growing, early maturing sort.

ALFALFA VARIETIES

Project Ag. 126.

Variety	Source of seed	Height when cut	Average yield per acre 1928					
			Green weight		Hay		Dry matter	
		in.	tons	lb.	tons	lb.	tons	lb.
Cossack	Dakota Improved Seed Co.	32·0	20	1,966	5	171	4	950
Grimm	Alberta Seed Growers	30·0	21	700	5	93	4	882
Baltic	Dakota Improved Seed Co.	27·6	18	33	4	934	3	1,862
Cossack	Paramount Alfalfa Farm	31·0	18	1,833	4	581	3	1,552
Variegated	Steele, Briggs	28·0	18	1,466	4	703	3	1,659
Grimm	Steele, Briggs	29·3	18	33	4	509	3	1,487
Grimm	A. B. Lyman	30·0	19	833	4	1,082	3	1,992
Ontario Variegated	Peel County	27·6	19	166	4	954	3	1,879
Sask. 666	University of Saskatchewan	26·3	17	1,933	4	230	3	1,243
Sask. 451	University of Saskatchewan	25·0	18	900	4	540	3	1,515
Medicago falcata	Paramount Alfalfa Farm	27·6	15	33	3	977	3	140

Project Ag. 126 deals with a test of alfalfa varieties. Only varieties or strains that were known to be reasonably winter hardy were included. The season favoured a heavy growth of alfalfa and the yields shown in the foregoing table are well above average. All the varieties shown in the test, with the exception of Medicago falcata have variegated coloured flowers, that is, flowers ranging in colour from blue to yellow. The Medicago falcata or Siberian alfalfa has yellow coloured flowers. This sort differs markedly from the others in its habit of growth, being less erect and slower to recover after cutting while its seed setting habits are very unsatisfactory. Sask. 666 and 451 are both strains of Grimm. Cossack is similar to Grimm in appearance except that it has a greater range of flower colour and a larger proportion of lighter coloured flowers. In a severe winter it would not likely prove the equal of Grimm in hardiness. Baltic is so similar in appearance and performance to Grimm that it is not possible to distinguish one from the other.

RED CLOVER VARIETIES

Project Ag. 146

Variety	Height when cut	Yield per acre 1928					
		Green weight		Hay		Dry matter	
	in.	tons	lb.	tons	lb.	tons	lb.
St. Clet	23·5	13	100	3	422	2	1,651
Swedish Early	23·0	12	400	3	294	2	1,538
Kenora	25·0	14	1,100	3	280	2	1,526
Oxdrift	27·0	13	900	2	1,973	2	1,255
Swedish Medium Late	32·0	11	400	2	1,269	2	637
Altaswede	31·5	11	300	2	480	1	1,942
Ottawa	23·0	7	200	1	1,864	1	1,400
Swedish Late	32·0	8	000	1	1,757	1	1,306
*North Italy	00·0	0	000	0	000	0	000

*Completely winter-killed.

In the test of red clover varieties the Northern grown seed showed its superiority over that from southern sources. That describd as North Italy was entirely winter-killed. This seed was not as pure as the other sorts included in the test as it contained among other impurities a good proportion of alfalfa. It is unfortunate that no variety or strain of red clover has yet been found to be suitable to climatic conditions similar to those found at this Farm.

Project Ag. 161 SWEET CLOVER VARIETIES

Variety	Source of seed	Height when cut	Yield per acre 1928					
			Green weight		Hay		Dry matter	
		in.	tons	lb.	tons	lb.	tons	lb.
Arctic	Steele, Briggs	50·0	18	1,200	3	789	2	1,975
Common White	Steele, Briggs	49·5	16	1,700	3	311	2	1,553
Yellow	Steele, Briggs	40·5	16	400	3	108	2	1,375
Yellow	J. G. Haney (I.H.C.)	53·5	15	1,900	2	1,983	2	1,265
Macor	Man. Agric'l. College	49·0	16	100	2	1,728	2	1,040

From the standpoint of yield there is no great difference in any of the sweet clover varieties shown in the above table. They were cut just as they were beginning to bloom. The Arctic variety gave the heaviest yield in this test. This is a white blossomed sort, somewhat shorter and finer stemmed than the Common White. It is also very hardy and appears to be resistant to root-rot which sometimes causes severe winter-killing. The Yellow Blossom kind supplied by J. G. Haney proved slightly earlier and finer in quality than any of the others.

Project Ag. 242 DATES OF SEEDING OATS FOR HAY

Date seeded	Date cut	Height	Average yield per acre 1925-28					
			Green weight		Hay		Dry matter	
		in.	tons	lb.	tons	lb.	tons	lb.
May 22	Aug. 17	36·0	7	484	2	1,877	2	1,189
May 15	Aug. 16	38·3	7	535	2	1,799	2	1,115
June 5	Sept. 3	36·5	6	735	2	1,571	2	913
June 12	Sept. 13	38·0	6	235	2	1,470	2	823
May 29	Aug. 20	28·5	6	1,020	2	1,063	2	464
June 19	Sept. 19	40·0	5	1,438	2	805	2	41

Project Ag. 242 dealing with dates of seeding oats for hay has been carried on during the last four years. Results to date have favoured the earlier seedings, which not only have given higher yields, but can be handled before the rush of harvest work takes place.

Project Ag. 245 STAGE OF CUTTING OAT VARIETIES FOR HAY

Variety	Stage cut	Average yield per acre 1925-1928					
		Green weight		Hay		Dry matter	
		tons	lb.	tons	lb.	tons	lb.
Banner	Dough	10	705	4	702	3	1,658
Victory	Dough	9	145	3	1,038	3	194
Gold Rain	Dough	9	293	3	861	3	38
Leader	Dough	7	890	2	1,773	2	1,080
Longfellow	Dough	6	1,295	2	1,578	2	912
Laurel	Dough	6	1,040	2	1,130	2	514
Alaska	Dough	6	133	2	730	2	162
Banner	Milk	6	1,475	2	517	1	1,975
Laurel	Milk	6	1,443	2	446	1	1,913
Longfellow	Milk	6	1,040	2	327	1	1,808
Victory	Milk	6	915	2	193	1	1,690
Leader	Milk	5	1,873	2	162	1	1,663
Gold Rain	Milk	6	508	2	136	1	1,640
Victory	Bloom	5	1,985	1	1,705	1	1,260
Alaska	Milk	5	416	1	1,492	1	1,056
Banner	Bloom	5	960	1	1,161	1	782
Gold Rain	Bloom	4	1,388	1	798	1	462
Laurel	Bloom	4	1,225	1	782	1	448
Leader	Bloom	4	665	1	631	1	315
Longfellow	Bloom	4	578	1	268	0	1,996
Alaska	Bloom	3	1,900	1	231	0	1,963

Project Ag. 245 was designed to determine the best time to cut oats for hay. After oats are headed there are three distinct stages before ripening, the bloom, the milk and the dough. The average results to date show that cutting in the dough stage gives the highest yield for all varieties in the test. The standard varieties such as Banner and Victory are usually much better for hay purposes than the earlier varieties like Alaska. The Laurel variety included in this test is a hulless oat.

ANNUAL HAY CROPS—GRAIN VARIETIES

Project Ag. 246

Crop	Height	Average yield per acre 1926-28					
		Green weight		Hay		Dry matter	
	in.	tons	lb.	tons	lb.	tons	lb.
Banner oats	55·3	12	1,627	4	576	3	1,546
Banner oats and Chancellor peas	(o)51·5						
	(p)28·0	10	993	3	428	2	1,654
Marquis wheat	42·0	7	1,040	3	414	2	1,642
Feeder barley	41·5	8	773	3	371	2	1,606
Banner oats and Feeder barley	41·5	9	1,013	3	323	2	1,564
Banner oats and Prolific spring rye	49·5	9	467	3	137	2	1,399
Banner oats and Mackay peas	(o)50·0						
	(p)32·5	10	1,947	2	1,989	2	1,268
Prolific spring rye	52·5	5	1,707	3	759	2	189
*Banner oats and Mackay peas. Peas sown 10 days before oats	(o)50·0						
	(p)32·0	9	60	3	483	2	1,705
*Banner oats and Chancellor peas. Peas sown 10 days before oats	(o)50·0						
	(p)29·0	9	60	2	1,852	2	1,150
*Banner oats and Siberian millet	(o)49·5						
	(m)25·5	7	840	2	1,756	2	1,065
*Prolific spring rye and Mackay peas	(r)54·0						
	(p)47·5	8	720	2	805	2	228

*1928 yields only.

Project Ag. 246 covers a test of annual hay crops, grain varieties. The varieties are included either singly or in combination. In this test Banner has invariably been the highest yielder. Where peas and oats are sown together it sometimes happens that the oats come along quickly and choke out the peas. Accordingly, during the past season, both varieties of peas used in the test were sown ten days before the oats as well as at the same time, in order to give them a better start. However, there was no marked difference in the growth of the peas in either the earlier or later seedings and further tests are necessary before any definite opinion can be formed regarding the wisdom of this practice.

ANNUAL HAY CROPS—LEGUMES

Project Ag. 247

Crop	Height	Average yield per acre, 1926-28					
		Green weight		Hay		Dry matter	
	in.	tons	lb.	tons	lb.	tons	lb.
Mackay peas	61·0	11	13	3	133	2	1,397
Mackay peas and common vetches	(p)52·5						
	(v)47·5	12	93	2	1,621	2	893
Hubam sweet clover and common vetches	(sc)45·0						
	(v)32·0	10	1,260	2	1,302	2	665
Common vetches	38·5	10	133	2	1,159	2	540
Sand vetches	33·0	9	1,720	2	139	1	1,641
*Hubam sweet clover	37·0	7	390	1	1,314	1	917

*1927 and 1928 only.

Annual legumes such as peas, vetches and Hubam sweet clover are included under project Ag. 247. Mackay peas have given the best results to date in this test. It should be noted also that common vetches gave higher yields than sand vetches and were more easily handled.

Project Ag. 248 — ANNUAL HAY CROPS—GRASSES

Crop	Height	Average yield per acre, 1926-28		
		Green weight	Hay	Dry matter
	in.	tons lb.	tons lb.	tons lb.
Siberian millet	36·3	8 140	2 1,920	2 1,208
Common millet	36·0	7 467	2 1,738	2 1,049
Japanese millet	37·0	8 1,827	2 790	2 214
Sudan grass	50·0	6 420	1 1,911	1 1,444
Hog millet	30·0	5 407	1 1,381	1 975

Under project Ag. 248 four varieties of millet and sudan grass have been tested since 1926. The Siberian and Common varieties have given the best average yield. These varieties have been at least two weeks earlier than the Japanese. The Hog millet was the shortest and earliest of the varieties in the test. Although it grows taller than the millets, Sudan grass is somewhat low in yield.

WESTERN RYE GRASS

Project Ag. 221

Number	Height when cut	Average yield per acre, 1928		
		Green weight	Hay	Dry matter
	in.	tons lb.	tons lb.	tons lb.
93	43·6	8 1,500	3 1,853	3 911
97	40·6	8 400	3 1,236	3 368
83	41·6	7 1,133	3 1,059	3 212
39	41·3	7 1,000	3 842	2 21
31	42·6	7 666	3 683	2 1,881
Commercial	43·3	7 1,400	3 653	2 1,855
54	42·6	7 666	3 582	2 1,792
5	39·6	7 1,100	3 519	2 1,737
13	46·0	6 900	3 261	2 1,510
19	44·0	6 1,633	2 1,982	2 1,264

Project Ag. 221 covers a test of western rye grass strains. A good standard commercial sort is also included in the test. Strain No. 93 was the best yielder in 1928 and also in 1927. However, as there is no great difference in the yields of some of the strains further testing is still necessary before definite conclusions can be reached.

MISCELLANEOUS GRASSES

Project Ag. 255

Variety and amount of seed used	Yield per acre, 1928			Average yield per acre, 1927-28		
	Green weight	Hay	Dry matter	Green weight	Hay	Dry matter
	tons lb.	tons lb.	tons lb.	tons. lb.	tons lb.	tons lb.
Western rye....15 pounds	3 633	1 881	1 535	4 742	2 26	1 1,543
Timothy....15 "	3 1,033	1 730	1 402	4 1,042	1 1,717	1 1,271
Brome....15 "	2 1,500	1 193	0 1,930	3 1,900	1 1,205	1 821
Tall oat....30 "	3 1,550	1 957	1 602	3 1,925	1 1,088	1 718
Red top....24 "	3 550	1 668	1 348	3 1,425	1 909	1 560
Canada blue....24 "	4 450	1 1,526	1 1,103	3 1,100	1 869	1 525
Meadow fescue....30 "	2 433	0 1,703	0 1,499	3 492	1 560	1 253
Orchard....30 "	1 866	0 817	0 719	2 1,783	0 1,748	0 1,538

The plots included in the test of miscellaneous grasses covered in project Ag. 255 were sown in 1926. The seasons of 1927 and 1928 both favoured grasses like timothy which show up to better advantage than they otherwise would under conditions of lower precipitation during the growing months. In spite of this, western rye grass, which is the only native grass in the test, has been the heaviest yielder taking the two years results together. This has also been true in previous years. It is a very useful grass under our conditions, both for hay and pasture.

HAY AND PASTURE MIXTURES USING ALFALFA AS A BASE

Project Ag. 259

Variety	Yield per acre, 1928			Average yield per acre, 1927-28		
	Green weight	Hay	Dry matter	Green weight	Hay	Dry matter
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Alfalfa and timothy	5 833	1 1,479	1 1,061	6 1,867	2 303	1 1,787
Alfalfa alone	5 1,550	1 1,371	1 966	7 1,475	2 243	1 1,733
Alfalfa and brome	5 133	1 1,249	1 860	6 1,092	2 110	1 1,617
Alfalfa and Canada blue	5 1,033	1 1,310	1 913	7 417	2 107	1 1,616
Alfalfa and tall oat	5 1,600	1 1,381	1 976	7 200	2 85	1 1,596
Alfalfa and western rye	5 733	1 1,251	1 861	6 1,542	2 30	1 1,546
Alfalfa and red top	5 1,633	1 1,399	1 992	7 517	1 1,989	1 1,511
Alfalfa and meadow fescue	5 333	1 1,047	1 682	6 1,792	1 1,936	1 1,464
Alfalfa and Kentucky blue	5 300	1 1,052	1 685	6 1,700	1 1,917	1 1,447
Alfalfa and orchard	4 1,566	1 675	1 354	5 1,983	1 1,443	1 1,030

Project Ag. 259 is a test of hay and pasture mixtures using alfalfa as a base. This test was laid down in 1926 and two years results are shown in the above table. In 1928 only one cutting of hay was obtained. Under ordinary circumstances, there should have been a second cutting which would, of course, have been mainly alfalfa. It was unfortunately necessary, owing to unforeseen circumstances, to plough up the plots before this could be accomplished. The yields are, therefore, considerably lower than otherwise would have been the case. Keeping this fact in mind, it is interesting to compare the results of this experiment with those of project Ag. 255. The yields favoured the plots which contained alfalfa.

HAY AND PASTURE MIXTURES USING ALFALFA AS A BASE AND WESTERN RYE

Project Ag. 259A

Variety and amount of seed	Yield per acre, 1928			Average yield per acre, 1927-28		
	Green weight	Hay	Dry matter	Green weight	Hay	Dry matter
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Alfalfa (12) and western rye (12)	4 1,800	1 1,230	1 842	7 1,875	2 611	2 57
Alfalfa (14) and western rye (8)	4 1,400	1 1,150	1 772	7 1,300	2 603	2 51
Alfalfa (16) and western rye (8)	4 1,500	1 1,258	1 867	7 1,400	2 593	2 42
Alfalfa (10) and western rye (8)	5	1 1,230	1 842	7 900	2 221	1 1,715
Alfalfa (8) and western rye (8)	4 1,400	1 1,119	1 745	6 1,475	2 159	1 1,661
Western rye (15)	3 700	1 581	1 271	5 1,675	1 1,877	1 1,412

Project Ag. 259A was designed to determine the best rate of seeding alfalfa and western rye grass in combination. The plots were sown in 1926. Further results are necessary before definite conclusions can be drawn.

Project Ag. 260 — HAY AND PASTURE MIXTURES USING SWEET CLOVER AS A BASE

Variety	Yield per acre, 1928						Average yield per acre, 1927–28					
	Green weight		Hay		Dry matter		Green weight		Hay		Dry matter	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Yellow sweet clover and timothy	4	350	1	1,285	1	891	8	450	2	532	1	1,989
Arctic sweet clover and western rye	4	633	1	1,832	1	1,372	8	92	2	503	1	1,963
Yellow sweet clover and red top	5	700	1	1,675	1	1,234	8	1,975	2	488	1	1,949
Yellow sweet clover and alfalfa	6	1,200	1	1,740	1	1,291	9	750	2	369	1	1,885
Yellow sweet clover and Canada blue	4	700	1	1,296	1	900	8	975	2	297	1	1,781
Yellow sweet clover and brome	4	350	1	1,294	1	899	7	1,575	2	263	1	1,752
Yellow sweet clover and tall oat	3	1,100	1	674	1	354	8	425	2	245	1	1,736
Yellow sweet clover and western rye	4	600	1	1,688	1	1,245	7	775	2	184	1	1,682
Yellow sweet clover and Kentucky blue	3	600	1	489	1	191	8	450	2	145	1	1,649
Arctic sweet clover and Canada blue	4	1,200	1	1,614	1	1,180	8	225	2	99	1	1,608
Arctic sweet clover and alfalfa	5	1,600	1	1,388	1	977	7	1,900	2	68	1	1,578
Arctic sweet clover and meadow fescue	4	266	1	840	1	499	7	1,508	2	41	1	1,557
Yellow sweet clover and meadow fescue	3	1,650	1	703	1	379	8	100	2	31	1	1,548
Arctic sweet clover and timothy	3	1,533	1	924	1	573	7	1,242	2	29	1	1,546
Arctic sweet clover and red top	4	700	1	1,258	1	868	8	....	2	22	1	1,540
Arctic sweet clover and brome	3	1,833	1	1,024	1	662	7	1,067	1	1,995	1	1,516
Arctic sweet clover and tall oat	3	1,550	1	940	1	587	7	450	1	1,769	1	1,316
Yellow sweet clover and orchard	1	1,300	..	906	0	797	7	425	1	1,435	1	1,023
Arctic sweet clover and Kentucky blue	2	1,400	1	361	1	77	6	1,800	1	1,367	1	963
Arctic sweet clover and orchard	2	900	..	1,536	..	1,352	5	1,267	1	751	1	421

Project Ag. 260 deals with a test of hay and pasture mixtures using sweet clover as a base, instead of alfalfa. The Arctic variety, a white blossom sort and the ordinary yellow blossom sweet clover were used. The plots were sown in 1926. In 1927 two crops of sweet clover and grass were harvested. In 1928 only grass was harvested, as the sweet clover, being a biennial plant, had died out in the fall of 1927. The average yields over the two years do not show much difference for any of the combinations. It should be observed however that the plots containing western rye grass compare favourably with the others in the second year.

Project Ag. 264 — GRASSES AND CLOVERS IN COMBINATION

Variety	Yield per acre, 1928						Average yield per acre, 1927–28					
	Green weight		Hay		Dry matter		Green weight		Hay		Dry matter	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Arctic sweet clover, alfalfa and timothy	6	400	2	72	1	1,583	8	600	2	635	2	79
Arctic sweet clover, alfalfa and Canada blue	7	67	2	132	1	1,636	8	1,434	2	599	2	48
Arctic sweet clover, alfalfa and tall oat	6	633	1	1,875	1	1,410	8	1,017	2	589	2	38
Yellow sweet clover, alfalfa and timothy	6	....	1	1,937	1	1,464	8	1,000	2	423	2	1,892
Arctic sweet clover, alfalfa and Kentucky blue	6	233	1	1,742	1	1,293	8	667	2	388	1	1,861
Yellow sweet clover, alfalfa and western rye	6	367	1	1,875	1	1,410	8	1,017	2	373	1	1,848
Arctic sweet clover, alfalfa and red top	6	1,167	1	1,833	1	1,373	8	750	2	346	1	1,825
Arctic sweet clover, alfalfa and western rye	7	300	2	180	1	1,678	8	600	2	326	1	1,807
Arctic sweet clover, alfalfa and meadow fescue	6	933	1	1,952	1	1,478	7	1,933	2	320	1	1,802
Yellow sweet clover, alfalfa and meadow fescue	5	1,300	1	1,600	1	1,168	8	867	2	308	1	1,791
Arctic sweet clover, alfalfa and brome	6	100	2	104	1	1,612	7	1,767	2	288	1	1,774
Yellow sweet clover, alfalfa and Canada blue	6	200	1	1,850	1	1,388	8	825	2	260	1	1,748
Yellow sweet clover, alfalfa and brome	5	867	1	1,594	1	1,162	8	234	2	224	1	1,716
Yellow sweet clover, alfalfa and tall oat	5	1,700	1	1,618	1	1,184	8	83	2	74	1	1,585
Arctic sweet clover, alfalfa and orchard	5	766	1	1,010	1	649	7	1,233	1	1,915	1	1,446
Yellow sweet clover, alfalfa and red top	5	1,100	1	1,301	1	905	7	1,900	1	1,874	1	1,409
Yellow sweet clover, alfalfa and Kentucky blue	5	200	1	1,087	1	717	7	1,367	1	1,762	1	1,311
Yellow sweet clover, alfalfa and orchard	4	933	1	528	1	224	7	1,000	1	1,642	1	1,204

A test of grasses in combination with both sweet clover and alfalfa is carried out under project Ag. 264. The Arctic and yellow blossom sweet clovers are used with Grimm alfalfa. The rate of seeding is five pounds of sweet clover, five pounds of alfalfa and one-third the amount of grass seed sown under project Ag. 255. The plots were seeded in 1926 and contained no sweet clover by 1928. In 1928 one crop only was harvested instead of two. Under ordinary circumstances there should have been a second cutting of alfalfa. It was necessary, however, to plough up the plots as soon as the first crop of hay was removed. The yields in 1928, therefore, should be higher than they are. Both the growing seasons of 1927 and 1928 were very favourable for the growth of grasses and clovers, consequently, differences which might have been marked under conditions more nearly normal were not sufficiently apparent to draw conclusions.

HORTICULTURE

Data from which the peculiarities of the season may be fairly clearly interpreted are presented in tabular form. In justification for selecting these arbitrary seasons, viz: winter, November 1 to March 31; growing season, April 1 to July 31; fall, August 1 to October 31, it is believed that the weather experienced during these periods has a more direct influence on plant growth than has that during the calendar year, particularly where flowers, vegetables, fruit plants, and ornamentals are concerned. November and December records are from preceding years in all calculations.

METEOROLOGICAL DATA, 1928

Month	Precipitation			Mean temperature Fahr.		
	1928	Average for period 1926–1928 (incl.)	Average for period 1907–1925 (incl.)	1928	Average for period 1926–1928 (incl.)	Average for period 1907–1925 (incl.)
	in.	in.	in.	°	°	°
November	1·18	1·63	0·90	10·66	16·97	24·53
December	0·18	0·42	0·80	−6·16	3·45	8·13
January	0·15	0·35	0·97	15·74	10·14	−8·04
February	0·20	0·57	0·80	27·58	15·83	6·18
March	1·75	1·54	1·24	20·13	21·10	18·16
April	2·17	1·30	1·02	30·06	34·93	36·77
May	0·64	2·38	2·03	55·95	51·40	49·00
June	6·05	3·33	3·34	56·57	57·17	59·53
July	2·14	2·72	2·58	62·48	64·22	62·79
August	0·34	1·49	2·19	58·97	59·99	60·86
September	0·42	2·01	1·62	49·63	48·93	51·54
October	0·41	1·41	1·40	36·84	38·79	38·39

Extreme variations from the average in precipitation and temperature, (apparent in the table) are believed to have been responsible for winter-killing, when unprotected fruit plants and ornamentals, roses and spiraeas, chiefly, suffered. Had rains in May been more frequent, the recovery of many plants might have taken place.

Observations on the ability of fruit plants to survive winter when heeled-in led to the belief that apples, plums and currants will do so. The practice is not recommended for strawberries and raspberries.

Carrots, beets and cabbages left in the ground over winter had decayed in the spring. Onions however had lived over, and growth was revived by April 30.

Having a heavy snow blanket before freeze-up, peonies, irises, herbaceous perennials and tulips were given no winter covering of strawy manure. No apparent injury resulted even though the ground was bare on March 21.

The new greenhouse was not fully erected and equipped until about April 15. Seeding indoors therefor was later than usual. The first seeds were sown in the garden on May 4, but germination was slow and irregular owing to dry soil conditions and lack of rainfall.

Tree fruits came into blossom early, but the set of fruit was poor, chiefly owing to the dry weather which followed. Splendid crops of strawberries, and raspberries where the plants were protected, were secured, but no currants or gooseberries.

Rainfall in June was abnormally high. This caused delayed growth and with the killing frosts experienced during the week ending August 26, the growing season was generally poor, and results obtained somewhat irregular.

Attention is being concentrated on what seem to be the most important problems for this district. These have to do with production, propagation, winter-killing, plant selection, disease and insect control, and variety testing. Fruits, flowers, vegetables and ornamentals are embraced in these studies.

FRUITS

APPLES

Notes taken in the crab apple orchard showed that the trees which usually bear fruit produced little blossom or none at all. A light crop of crab apples was therefore secured. The varieties which fruited were, Pioneer, Transcendent, Jewel and Prince. The first named variety was an outstanding cropper, is an attractive yellow, quite good quality crab apple and particularly early, being harvested on August 29.

Many varieties of cross-bred apples which have been considered fairly hardy winter-killed. The behaviour and growth of these trees indicated that death was due to desiccation and drying out. Small leaves developed from the buds in the spring, and shoots were weak and stunted. These dried up later and strong growths from the crowns appeared.

It was an off year for the seedling apples, and no new ones of particular merit fruited. The propagation of those considered worthy continued, but root grafts made during the winter dried out after being planted in the spring.

Apple seedlings grown at Indian Head were planted in the nursery and seeds were secured from cross-pollinations in which McIntosh, Melba and Wealthy pollen was used on Transcendent and Northern Queen x August as female parents. These fertilizations were made on May 26, and the seed sown outdoors on October 30. Wealthy proved to be an unsatisfactory pollenizer for Transcendent.

Trees under observation in project H-592 outlined in detail in last year's report winter-killed sufficiently to make it advisable to recommence the study. New basal growths were made by most of the trees, so that future results can still be considered comparable.

Root grafts intended for use in project H-593 failed to grow when planted out. Others, however, will be grafted for planting in 1929. The required number of buds were "made" in the fall, and other trees will be top-worked in the spring. Scion wood of Patten Greening and a more tender variety is being used.

Typical winter-killing in 1928. A Columbia tree on July 21.

PLUMS

Less than twenty pounds of plums were picked. These were harvested before September 15, and were obtained from a few Topa seedling trees grown at Indian Head. The quality of these plums was just fair.

Most trees of fruiting size blossomed. They did so two weeks earlier than in 1927, the average date of coming into blossom in 1928 being May 25. Soil and climatic conditions at blossom time, however, were not favourable for fruit setting.

During the past year, the hardiness of the newer varieties of plums, hybrid plums, and cherries being grown was tested. Sapa, Okiya, Enopa and Eyami winter killed badly, while Pembina and Compass Cherry suffered to a less degree. There being practically no fruit, plum pocket was not observed. Neither were tent caterpillars in evidence. Spraying for the control of aphis was however necessary, nicotine sulphate at the rate of 1 pint in 100 gallons of water being used.

About six hundred plum seedlings grown from pits of the best quality plums fruiting at Indian Head were planted in the nursery. From these something of good quality and sufficient hardiness for existing climatic conditions may be obtained. No additional pits were planted in 1928.

Few of the buds, budded in the fall, grew satisfactorily. Where successful unions had been made growth began in the spring, but in each case it ceased and dried up during the dry weather in the early part of the season.

STRAWBERRIES

Details on the behaviour of four strawberry varieties under test at Indian Head were given in last year's report. Dr. Burrill and Senator Dunlap resemble each other to such an extent that both were regarded as the latter variety.

A good crop of berries was harvested. The picking season was prolonged by the plentiful rains in June. Senator Dunlap was again somewhat earlier than Easy Picker. The main crop of the latter was ripe around July 20, and was considered of slightly better quality than the former. Growers are advised to plant two varieties of different fruiting seasons.

In a blossom pruning study, project H-624, little can be reported at this time. The experiment was initiated but was soon discontinued when birds destroyed most of the first-ripening berries. It has since been decided to conduct this study in the greenhouse.

The plants intended for project H-624 are being utilized for another experiment. Details for this study have not been completely outlined, but the effects of "hilling" strawberry plants with an inch or two of soil immediately following the fruiting season will be noted. In 1928 plants were "hilled" on August 4 when growth of new (daughter) crowns was active. This treatment will be applied for a number of years, and the plants maintained as individual plants, i.e., all runners to be removed.

In conjunction with this study the correlation between runner formation and fruit production will be observed under Indian Head conditions. All runners that developed on the parent plants were removed before the first runner plants had formed, and the number removed from each plant recorded. Some means of preventing the destruction of berries by birds will also be sought, so that a record of the amount of fruit harvested from each plant may be obtained.

RASPBERRIES

Perhaps for no fruit plant was the value of a protective mulch more noticeable than for the raspberry. Little or no fruit was harvested where the canes were not covered during winter, whereas heavy yields of good quality berries were obtained from canes bent over and covered with soil on November 3, 1927.

RASPBERRY VARIETIES—1928

Variety	Number of hills	Number of canes	Number of fruiting spurs	Average number of fruiting spurs per cane	Date first ripe fruit	Comparative yield	Total yield
						pints	pints
Sunbeam	12	75	1,173	15·6	July 16	3·12	37·50
Brighton	12	71	869	12·2	" 19	2·83	34·00
Latham	12	54	692	12·8	" 25	2·31	27·75
Newman 23	10	40	446	11·1	" 23	1·92	19·25
Ohta	11	56	631	11·2	" 19	1·84	20·25
*Sarah	12	48	815	16·9	" 25	1·10	13·25

*Reported as Herbert in 1927.

On July 6 when the vigour of the new cane growth was examined the varieties were placed as follows: Sarah, Ohta, Sunbeam, Brighton, Latham and Newman 23. Where the plants were protected during the winter, the new canes were at least twelve inches taller on the average than those from plants that had not been protected.

The raspberry canes on the left were protected during the winter, while those on the right had no protection. Photo taken May 19.

CURRANTS

Currant bushes did not survive the winter without injury. The tips of the upright branches of most varieties either failed to revive in spring or produced very weak growths.

Of the varieties of red and white currants being grown at Indian Head, Red Grape, London, Simcoe King, London Market and White Dutch have upright habits of growth, while New Red Dutch, Red Dutch, Red Cross, Raby Castle, Victoria Red, Raspberry, Holland and Large White are somewhat prostrate in habit of growth.

Variation in habits of growth exists among the black currant varieties also. Topsy and Magnus have upright, while Eclipse, Saunders, Eagle and Kerry have somewhat spreading habits of growth.

Project H-591, a currant propagation study, was continued. Poor growing conditions existed following the planting out of the cuttings in spring owing to lack of moisture. Notes taken at the time of planting on those stored in sand during winter were: sand quite moist; blacks—some root activity below nodes but little callusing; reds—no root activity but some callusing. On May 23 however no growth had been made by any of the cuttings. In each treatment twenty-four cuttings were planted.

CURRANT CUTTINGS—NUMBER ROOTED AUGUST 13, 1928

Variety	Prepared and planted Nov. 2, 1927	Prepared and stored in sand Nov. 2, 1927 planted April 30, 1928	Prepared and planted April 30, 1928
Eagle (B)	3	13	2
Red Grape (R)	11	12	0

GOOSEBERRIES

No additional varieties of gooseberries were planted. The bushes in the plantation were not given any protection before winter, with the result that they winter-killed badly and produced no fruit.

GRAPES

The seedlings from native Manitoba grapes survived the winter without protection in splendid condition and the majority made strong growth before freeze-up.

VEGETABLES

ASPARAGUS.—Method of Propagation—Project H-596.—Progress in this study was made. Roots from seed sown outdoors on April 27, 1927, had undergone various treatments prior to planting on May 11 and 12, 1928. Plants lifted from the seed bed immediately before planting produced earliest growth. By the end of June, however, little difference existed between them and plants stored in moist sand in a cool cellar during winter. Those lifted and heeled-in outside on November 2, 1927, did not winter well or make satisfactory growth when planted. Portions of old roots made unsatisfactory growth, as did young roots stored in a cool cellar during winter hung from the ceiling in a jute sack.

This experiment is being extended using two year old roots and, as growth continues, observations on tip and shoot development will be made and recorded.

In the old plantation the first cutting of asparagus was made on May 18. On May 10 however when thirteen degrees of frost were recorded a number of tips 2 to 3 inches long were destroyed.

ASPARAGUS—Germination Studies—Project H-625.—Seeds were separated from the berry pulp by washing when ripe. Results from this study were: (*a*) Little difference marked the final number of seeds germinated in lots sown outdoors before winter and the following spring, respectively; (*b*) The former began to germinate two weeks earlier than the latter, germination was also more gradual and the resulting plants were stronger; (*c*) For one lot seed was obtained from berries left attached to a shoot hung indoors during winter. Although the final number of plants obtained was practically the same as in other spring sown lots, germination of this seed began about ten days earlier. The plants also were almost as strong as those from seeds sown in the fall; (*d*) A very small percentage of the seeds collected and sown in the spring had germinated when the final count was made. This study is being repeated, and duplicate tests of the spring sown lots will be made in the greenhouse.

BEANS—Variety Test.—Only two varieties in this test were considered ripe when the plants were harvested on August 27 to hasten drying. These were Princess Artois which gave the highest yield of ripe beans, and Interloper Challenge Black Wax, the second highest yielding variety. Other satisfactory varieties were Pencil Pod Black Wax, Stringless Green Pod, Masterpiece and Yellow Eye Yellow Pod.

Garden King, White Pole No. 1, and Hodson Long Pod proved much too late for this district.

BEANS—Planting Distances—Project H-58.—In this experiment Round Pod Kidney Wax and Davis White Wax beans were planted respectively at distances of 2, 4, and 6 inches apart in rows 30 inches apart. Highest yields of ripe beans were obtained in both varieties from the closest planting, and the lowest yields from the intermediate planting distance.

BEANS—Culture in Hills vs. Rows—Project H-629.—This project is designed to compare the hill and row methods of growing beans with equal numbers of

plants per area. Results for one year favoured the row method, but more reliable data are hoped for another year when thicker sowings will be made, and the plants thinned to the required distances and numbers after germination.

BEETS (Table)—Variety Test.—The earliest beets were Early Model, Eclipse, Detroit Dark Red and Early Flat Egyptian. All beets were harvested on August 28, and yields of marketable roots from rows 32 feet long in each case were: Crosby Egyptian, Detroit Dark Red, Early Model, 32 pounds each; Early Flat Egyptian, 24 pounds; Eclipse, 22 pounds; Black Red Ball, 21 pounds, and Improved Dark Red, 15 pounds.

Descriptive details of these varieties will be found on page 37 of the 1927 annual report from this farm.

BEETS (TABLE).—Harvesting at Different Dates for Storage—Project H-630. Commencing on August 4 five equal quantities by weight of Detroit Dark Red beets were stored at two-week intervals. The beets were placed in boxes in a cool root cellar and completely covered with dry sand. Towards spring these will be examined, and the general condition, loss of weight, and other characteristics of each lot will be noted.

BRUSSELS SPROUTS—Variety Test.—From the results of this test on the heavy soil existing at Indian Head, the conclusion that a dry fall favours the development of this crop seems justified. Yields of sprouts in pounds from thirty plants each of the three varieties tested were: Improved Long Island 8.25, Improved Dwarf 7.50, and Amager Market 5.25. The first two varieties were about ten days earlier than Amager Market.

BORECOLE OR KALE—Variety Test.—Repeated tests have demonstrated the suitability of the Dwarf Green Curled variety for planting at Indian Head. No other varieties were grown in 1928.

CABBAGE—Variety Test.—Of the varieties of white cabbage tested in 1928 Golden Acre was ready for use one week earlier than Early Jersey Wakefield and Early Paris Market, and two weeks earlier than Copenhagen Market. Next ready for use were Danish Summer Ballhead, Succession and Early Summer.

Good later varieties suitable for winter storage were Enkhuizen Glory, Brunswick Short Stem, Danish Roundhead and Kildonan. Owing to lack of rainfall in July and August the average size of head was much below that of last year.

Chester Savoy again excelled Kinver Globe in average size of head, although both varieties were considered ready for use on the same date. This kind of cabbage matures late and should not be harvested until immediately before severe frosts are experienced.

Both varieties of red cabbage tested grew satisfactorily, although the average weight of head was much below that of last year. Haco and Danish Stonehead were the varieties grown.

CARROTS—Variety Test.—Nine varieties were grown in 1928. Of these Chantenay and Early French Forcing were the earliest, best quality, intermediate carrots, while Nantes and Oxheart were early, good quality carrots, half-long and short respectively. Other varieties, though heavier croppers, were of poorer quality, had stronger tops, and correspondingly larger cores.

With the exception of St. Valery and Henderson Intermediate, long varieties which were harvested on September 20, all carrots were dug on August 28, about 115 days from the time the seed was sown.

CARROTS.—Harvesting at Different Dates for Storage—Project H. 631.—As with table beets (project H. 630) equal weights of carrots from the same sowing were harvested and stored in dry sand, at two-week intervals, commencing August 4. Five quantities were stored for the purpose of studying the keeping qualities of carrots harvested at different dates.

CAULIFLOWERS—Variety Test.—Although the season was not favourable for the production of very large heads, the quality of cauliflower was very good. Seven varieties and strains were tested, the earliest being Snowball and Early Erfurt. Later in the season were Danish Perfection and Veitch Autumn Giant. The average weight of head ranged from one to one and one-half pounds.

CELERY—Variety Test.—All varieties in this test produced satisfactory stalks of celery. Plants were set in the garden on the level on June 5, and the last was harvested on August 20, the stalks averaging around three-quarters of a pound each.

The best early varieties were Paris Golden Yellow, Golden Self Blanching and Golden Plume, while Giant Pascal, Emperor, Winter King and Winter Queen were the outstanding late or winter varieties.

CELERY—Dates of Planting—Project H. 597.—Early planting as in 1927 favoured the production of the largest and best quality celery. Commencing on June 5 three plantings each of Giant Pascal and Winter King were made at ten-day intervals.

CELERY—Dates of Harvesting for Storage—Project H. 632.—This project was outlined for the purpose of studying the effect of frost injury on the keeping quality of celery in storage. The study also permitted a comparison of the keeping qualities of mature and immature celery, because the earliest stored plants were quite young.

At the time of writing this report plants stored before frost, after a little frost, and after severe freezing, had been examined. There was least loss through leaves decaying in the youngest plants, and the average weight of usable celery was practically the same in each lot. The centres of all plants remained crisp up to the end of December.

CHARD—Variety Test.—All varieties tested were considered fit for use on July 21. Even in hot weather the quality of this vegetable remained good, the best being Fordhook Giant followed by Silver Leaf and Lucullus.

CHICORY—Variety Test.—One variety of chicory was tested. It made strong growth and produced large plants, but its use as a household vegetable is very restricted as yet.

CITRONS—Variety Test.—Seed of Red Seeded and Colorado or Green Seeded citrons was sown outdoors on June 4. Fruits of the former variety were ready to harvest on September 20, while none of the latter matured.

CORN—(Table)—Variety Test.—In 1928 seed of the varieties in this test was sown on May 19. Germination was not complete until June 9.

CORN VARIETIES—1928

Variety	Source of seed	Date of appearance in silk	Date ready for use	Height of stalk on Aug. 15	Weight of 12 average ears	Date last ears harvested	Total number of ears harvested
				in.	lb. oz.		
Pickaninny	Ottawa	July 27	Aug. 10	42	3 0	Aug. 25	50
Banting	Ottawa	July 29	Aug. 10	48	3 14	Sept. 8	56
Burleigh Co. Mixture	Will	July 21	Aug. 15	69	8 1	Sept. 8	82
Assiniboine	Will	Aug. 1	Aug. 15	69	6 1	Sept. 8	68
60 Day Golden	Child	July 31	Aug. 15	66	8 2	Sept. 15	45
Alpha	Harris	July 29	Aug. 17	63	5 11	Sept. 8	71
Early Adams	Ferry	July 29	Aug. 18	57	8 11	Sept. 8	39
Sunshine	Will	Aug. 2	Aug. 23	69	8 6	Sept. 8	46
Gehu	Will	Aug. 2	Aug. 25	72	6 8	Sept. 15	75
Early Dighton	Moore	Aug. 3	Aug. 25	66	7 2	Sept. 15	49
Malakoff	Vaughan	Aug. 3	Aug. 27	60	5 6	Sept. 15	37
Golden Bantam	James	Aug. 4	Aug. 27	69	5 6	Sept. 15	65
Early Malcolm	Ottawa	Aug. 6	Aug. 31	72	7 0	Sept. 15	44
Golden Bantam	McDonald	Aug. 6	Sept. 5	69	5 12	Sept. 15	32

In the foregoing table varieties have been arranged according to earliness, this being considered a quality of prime importance for this latitude.

CORN (Table) Removing Suckers—Project H. 101.—Golden Bantam and Early Malcolm were used in this study, seed for which was sown outdoors on May 19. The first suckers were removed on July 4 and the last on July 30. None were removed from the stem higher than three or four inches from the ground level, and all suckers were removed when quite small.

In 1928 the removal of suckers in both varieties resulted in, (*a*) earlier appearance of tassel and silk, (*b*) taller plants, (*c*) greater average weight of ears and (*d*) larger total yield.

CUCUMBERS—Variety Test.—Satisfactory crops of this vegetable have over a period of years been obtained from seed sown outdoors during the first two weeks in June. Sowing in rows six feet apart is practised, the plants are thinned to a distance of eighteen inches apart, and harvesting commences when the cucumbers are large enough for pickles.

Of the varieties tested the earliest were Early Russian, Early White Spine, Long Green, and White Spine, while the best croppers were Double Yield, Early Russian, Long Green and Early White Spine.

EGG PLANTS—Variety Test.—An Indian Head selection of Extra Early Dwarf egg plant was the earliest to bloom and it also outyielded Extra Early Dwarf (Will) and Black Magasaki. From twenty-five plants each of these varieties yields were 8.5 and 3 pounds respectively.

HERBS—Variety Test.—Sage and Summer Savory produced satisfactory crops, Horehound was poor, and Thyme, Lavender and Rosemary failed to grow from seed sown outdoors on May 4.

KOHL-RABI—Variety Test.—Sown and grown indoors in spring and later planted in the garden with other cabbage family members this vegetable usually produces roots fit to use in from four to six weeks. It is tasty and of good quality when immature (2 to 3 inches in diameter). White Vienna and Purple Vienna are good varieties of the colours indicated.

LETTUCE—Variety Test.—Owing to lack of moisture irregular germination characterized the beginning of this test in 1928. With the addition of one or two novelties the varieties tested were the same as those grown the previous year.

Grand Rapids is a variety of leaf lettuce that is sure to give satisfaction.

The final order of merit of the butter type of head lettuce varieties, from the standpoint of quality and earliness, was Salamander, California Cream Butter, Crisp as Ice, Big Boston and Mignonette. It was also observed on July 18 that Early Paris Market and May King had gone to seed without forming satisfactory heads.

Varieties representing the iceberg type of lettuce were of short season, tip burn developing soon after heads had formed towards the end of July. The best quality heads were produced by Giant Crystal Head with New York, Iceberg and Wonderful somewhat earlier, of about equal quality, but slightly inferior to Giant Crystal Head. These were ready to harvest later than the butter type varieties and Trianon Cos, a coarser, longer and more upright type of head lettuce.

LETTUCE—Production of Head Lettuce—Project H. 598.—Results of the second year of this study indicate that where plants grown from fall sown seed escape late spring frosts, early and good quality heads are produced. By the first week of July these were all ready to harvest, and had developed seed stalks at the end of July.

Plants grown from seed sown indoors on April 26 and transplanted to the garden on May 30 had formed heads by July 14. On August 14, fifty per cent of these had developed seed stalks. From seed sown outdoors on May 28 good heads had formed on a few plants on August 1, but few of these were fit to harvest.

LETTUCE—Dates of Sowing—Project H. 633.—This experiment was undertaken with a view to finding out just how late head lettuce seed may be sown, and good crops harvested. From one year's trial it would seem that it must be sown as early as possible for best results.

MUSKMELONS—Variety Test.—Frost on August 20 checked the growth of muskmelons. They were not killed however, and seven days later there had developed on the Golden Champlain variety a number of nice fruits. These were almost mature when killing frosts were experienced. No more promising variety than Golden Champlain has been tested for some years.

ONIONS—Variety Test.—For an early maturing pickling onion Barletta is still outstanding. This variety was harvested two weeks earlier than Silver King the other pickling onion tested.

Yields for the other onions tested were generally satisfactory. These are listed in groups in order of ripening as indicated by tops falling over, dating from August 10 to September 5: (1) Early Red Flat, (2) Ebenezer, (3) Ohio Yellow Globe, (4) Large Red Weathersfield (McDonald), Yellow Globe Danvers (Graham), (5) Large Red Weathersfield (Graham), Southport Yellow Globe, (6) Giant Prizetaker, Large Red Weathersfield (Ottawa), Yellow Globe Danvers (Ottawa), Southport Red Globe, (7) Ailsa Craig, Giant Gibraltar, Large Yellow Prizetaker. (No tops in last group had ripened.)

ONIONS—Methods of Controlling Maggots—Project H. 132.—Control measures were applied, but there did not seem to be any infestation of this pest in 1928.

ONIONS—Production for Winter Storage (Sets)—Project H. 599.—For two years heaviest yields were obtained from sets planted three inches deep. The advantage seems to result from earlier growth after planting, a greater uniformity in growth, and apparently less injury from maggots because of earlier maturity. In the matter of seed stalks the number produced on the various lots was not significantly different.

PARSLEY—Variety Test.—Growth of parsley from outdoor spring seeding has been successful during the past two years. Seed of Moss Curled and Triple Curled was sown on May 4. It did not germinate, however, until June 18 but was considered fit for use on July 10.

Parsley plants when lifted and put in pots or other containers before freeze-up will live over winter, and provide greens if kept in the sill of the kitchen or living room windows.

PARSNIPS—Variety Test.—Owing to lack of moisture germination of parsnip seed did not take place for more than five weeks after it was sown. Yields were consequently low, although the roots on the average were fairly well developed. Cooper Champion was the heaviest cropper followed in order by Hollow Crown (McKenzie), Guernsey XXX, and Hollow Crown (Ottawa).

PEAS—Variety Test.—Seed of all varieties was sown on May 3 and 4, but germination was irregular dating from May 14 to June 1. Under these circumstances it was felt that the varieties could not be grouped according to season as in previous reports.

In the following table the varieties are listed according to the yields of ripe peas harvested from rows 32 feet long.

PEAS—VARIETIES—1928

Variety	Average length of vines	Average length of pods	Average number of peas in pods	Size of peas	Quality on base of 10 points	Yield of ripe peas	
	in.	in.				lb.	oz.
Gregory Surprise x English Wonder	60	2·50	6	Small	8·0	4	14
Lincoln	26	3·50	8	Medium to large	8·5	4	1
McLean Advancer	34	2·75	7	Large	9·0	3	13
Gradus x English Wonder	44	2·75	6	Very large	8·0	3	5
Admiral Beatty	48	4·25	8	Very large	9·5	3	4½
Telephone	48	4·50	8	Very large	9·0	3	0
Pioneer	24	4·00	7	Large	9·0	2	10
Senator	30	3·50	6	Large	8·5	2	10
Laxtonian	18	3·00	6	Medium to large	8·5	2	6
Sutton Excelsior	18	3·25	6	Large	8·0	2	4½
Alaska	24	2·50	7	Small	7·5	2	2
Stratagem	40	4·25	9	Very large	9·0	2	2
Blue Bantam	18	3·50	7	Large	8·5	2	1
Little Marvel	14	2·50	7	Medium to large	8·0	1	14
Marchioness	24	3·50	7	Large	8·0	1	13
Thos. Laxton	34	3·00	6	Large	9·5	1	13
Early Six Weeks	17	2·50	6	Small	8·5	1	6

NOTE.—Alaska, Thos. Laxton and Early Six Weeks were fairly well ripened by July 30.

PEAS—Planting Distances—Project H-148. In this study Alaska, Thos. Laxton and Stratagem were the varieties used. Seed of each was planted on May 4, at distances of 1, 2 and 3 inches apart. In each variety the various lots were in bloom on the same date, they were considered ready for use at the same time, and ripened uniformly.

PEAS—PLANTING DISTANCES 1928

Variety	Yields of ripe peas from rows 32 feet long					
	Peas planted 1 inch apart		Peas planted 2 inches apart		Peas planted 3 inches apart	
	lb.	oz.	lb.	oz.	lb..	oz.
Alaska	5	6	5	6	5	3½
Thos. Laxton	4	1	5	2	4	8
Stratagem	3	6	4	3	2	0

PEPPERS—Variety Test.—Only two varieties of peppers were grown in 1928. These were Golden Dawn and Harris Earliest, plants of which were set in the garden on June 6. Like other tender plants these were injured by frost during the week ending August 26. Growth continued, however, and total yields harvested on September 27 were: Golden Dawn 23 pounds and Harris Earliest 17.5 pounds. The latter variety gave a yield of 1.5 pounds of ripe peppers, none being obtained from the former.

PUMPKINS—Variety Test.—Although seed was sown indoors on April 23, and plants set in the garden on June 6, poor development was made by this crop. Earliest to ripen was the variety Sweet or Sugar but Connecticut Field and Pie outyielded Sweet or Sugar and Small Sugar.

POTATOES—Variety Test.—By practising the tuber-unit system of planting great uniformity in the potato varieties being grown at this farm has been obtained. Disease has likewise been largely eliminated and definite strains established.

Dates on which varieties were harvested represent in a relative way their season, the ripening of the tops being taken as an indication of the development and maturity of the tubers. Yields of those harvested after September 24 were slightly reduced owing to frost injury and the frozen potatoes being discarded.

POTATO VARIETIES, 1928

Variety	Original source of seed	Date harvested	Computed yield per acre marketable tubers. (Size of plots 1/15 acre)	
			bush.	lb.
Bliss Triumph	Montana	Sept. 12	328	32
Irish Cobbler	Invermere, B.C.	Sept. 12	325	36
Earliest of All	Invermere, B.C.	Sept. 8	297	44
Early White Prize	Invermere, B.C.	Sept. 19	280	08
Blue Snyder	Invermere, B.C.	Sept. 19	277	56
Irish Cobbler	Indian Head, Sask.	Sept. 8	272	48
Epicure	Invermere, B.C.	Sept. 12	271	20
Carter Early	Invermere, B.C.	Sept. 8	269	52
Ashcroft	Invermere, B.C.	Sept. 8	259	36
Manistee	Invermere, B.C.	Sept. 27	253	44
Up-to-Date	Invermere, B.C.	Sept. 27	246	24
Gold Coin	Invermere, B.C.	Sept. 24	244	56
Early Bovee	Invermere, B.C.	Sept. 24	237	36
Burbank Russet	Invermere, B.C.	Sept. 24	234	40
Late Puritan	Invermere, B.C.	Sept. 27	223	40
Wee McGregor	Invermere, B.C.	Sept. 27	220	00
Seedling (R. Day)	Indian Head, Sask.	Sept. 12	218	32
Gold Nugget	Indian Head, Sask.	Sept. 12	215	36
Sharpe Express	Invermere, B.C.	Sept. 8	214	08
Houlton Rose	Invermere, B.C.	Sept. 27	200	56
Netted Gem	Invermere, B.C.	Sept. 28	196	32
Jersey Royal	Invermere, B.C.	Sept. 12	195	04
Gold Nugget	Invermere, B.C.	Sept. 12	193	36
*Precocity	Invermere, B.C.	Sept. 12	187	44
Early Ohio	Indian Head, Sask.	Sept. 28	183	20
Dalmeny Beauty	Indian Head, Sask.	Sept. 27	178	56
Sir Walter Raleigh	Invermere, B.C.	Sept. 19	176	00
White Ohio	Invermere, B.C.	Sept. 8	174	32
Delaware	Invermere, B.C.	Sept. 27	173	48
Early Ohio	Invermere, B.C.	Sept. 8	170	52
Late Puritan	Indian Head, Sask.	Sept. 28	165	00
King Edward VII	Invermere, B.C.	Sept. 28	154	00
Rural Russet	Invermere, B.C.	Sept. 27	152	32
*Golden Russet	Indian Head, Sask.	Sept. 19	145	56
Early Norther	Invermere, B.C.	Sept. 27	133	28
*Green Mountain	Invermere, B.C.	Sept. 24	117	20
Pearl	Invermere, B.C.	Sept. 27	117	20
Kerr Pink	Invermere, B.C.	Sept. 28	108	32

*Yields of these varieties were reduced by the sprayer wheels passing over the rows.

POTATO—Sprouting Seed—Project H-159.—Seed for this test was selected from the same bin. That for sprouting was placed in flats under a greenhouse bench in gentle heat, about six weeks before planting time. The remainder was left in the root cellar to prevent sprouting.

Uniformly sized sets were planted on May 25, and the tubers were harvested on September 6. Taking the yield of the unsprouted lots in both varieties as one hundred per cent, the sprouted Early Ohios yielded 123 per cent and the sprouted Irish Cobblers 129 per cent.

RADISH—Variety Test.—Twelve varieties and strains were included in this test. Of these Twenty Day and Chartier were earliest followed by Scarlet Turnip White Tipped. The other varieties were from two to nine days later. The earliest radishes were of the best quality, and these varieties also were the first to produce seed stalks.

So far, the growing of winter radishes has been accompanied by severe infestations of maggots. Every year a great number of roots have been rendered unfit for use thereby, and very few have been stored over winter. Long Black Spanish has usually outyielded Round Black Spanish.

RUTABAGA—Variety Test.—Yellow Globe and Golden Neckless were the only varieties grown in 1928. These were harvested on October 8 and yields of marketable roots were 82 pounds and 54 pounds respectively.

SALISFY—Variety Test.—It would seem that special soil conditions should exist for the production of strong, straight roots of this vegetable. At this farm none but very much-branched roots have been obtained, and these are unsuitable for the market or kitchen. There was little difference between the crops produced by Long White and Sandwich Island when compared in 1928.

SPINACH—Variety Test.—From outdoor seeding rapid growth of this crop usually takes place. The cutting season ends rapidly with the arrival of warm weather and subsequent development of seed stalks.

Of the varieties tested King of Denmark was considered the best. Big Crop and Noble Gandry were also good quality varieties. With Bloomsdale, Princess Juliana, and Victoria most plants had gone to seed on July 18, when New Zealand spinach was nicely ready for use.

SQUASH AND VEGETABLE MARROW—Variety Test.—As with other vine crops the season of active growth of these vegetables was short. Plants started under glass were set in the garden on June 6. Pollination agents were very inactive throughout the period of growth, and a very poor set of fruit resulted.

On the basis of comparative total yields, varieties tested gained the following order of merit: Green Hubbard, Long White Bush Marrow, English Vegetable Marrow, Summer Crookneck and Summer Asparagus. Golden Hubbard and Delicious failed to mature any fruits.

TOMATOES—Variety Test.—With such a frost-tender crop as the tomato a normal test seems difficult to obtain. In 1927 hail was the abnormal factor and in 1928 frosts during the week ending August 26 checked further growth. The ripening of fruits continued after that date, however, but yields of ripe fruits from all varieties were low.

TOMATOES—VARIETIES 1928

Variety	Source of seed	Date in blossom	Date first ripe fruit	Yield from 5 plants					
				Ripe fruit		Green fruit		Total	
				lb.	oz.	lb.	oz.	lb.	oz.
Alacrity	O-9719	June 6	Aug. 9	2	14	14	4	17	2
Alacrity	O-11381	" 6	" 9	2	2	12	0	14	2
IXL Early	Patmore	" 6	" 13	2	0¼	10	12	12	12¼
Earliana Select	Moore	" 12	" 13	1	15½	11	8	13	7½
Alpha	Dreer	" 23	" 13	1	13	9	12	11	9
Pink No. 1	O-9731	" 6	" 7	1	9	11	12	13	5
Herald	O-9725	" 9	" 7	1	8½	8	8	10	0½
A x B B	O-11390	" 7	" 13	1	8½	10	12	12	4½
Wayahead	Bruce	" 19	" 13	1	8½	9	0	10	8½
Princess of Wales	Sutton	" 20	" 13	1	7	11	12	13	3
Prosperity	Patmore	" 6	" 13	1	6½	15	8	16	14½
Burbank	Burbank	" 12	" 13	1	4½	16	0	17	4½
Sparks Earliana	McDonald	" 6	" 13	1	3½	12	4	13	7½
Crimson Cushion	Henderson	" 18	" 13	1	1½	14	8	15	9½
Earlibell	McDonald	" 12	" 13	1	0½	10	12	11	12½
Alacrity x Hipper	O-6568	" 6	" 9	0	15½	12	12	13	11½
Burbank	Bruce	" 12	" 13	0	15½	11	8	12	7
A x B B	O-11389	" 7	" 13	0	15½	8	8	9	7½
Bonny Best	Stokes	" 21	Sept. 6	0	14½	14	0	14	14½
Early Atlantic	McKenzie	" 14	Aug. 15	0	14½	11	4	12	2¼
Pink No. 2	O-9730	" 4	" 9	0	12½	13	8	14	4½
Pink No. 2	O-6569	" 4	" 9	0	12½	9	4	10	0½
New Gregory	Gregory	" 21	" 13	0	12	12	4	13	0
Penn State Earliana	Stokes	" 15	" 13	0	11½	11	8	12	3¼
Fargo	N. Dak	" 19	" 15	0	10½	9	3	9	13¾
Canadian	Harris	" 23	" 15	0	10¼	14	0	14	10¼
Marvena	Harris	" 23	" 13	0	9	11	0	11	9
Viking	N. Dak	" 16	" 13	0	9	9	2	9	11
Manifold	Livingstone	" 21	" 13	0	8½	10	8	11	0½
Bloomsdale	Langdon	" 23	" 15	0	8	13	0	13	8
First and Best	Bruce	" 21	Sept. 6	0	7½	15	8	15	15½
Earliana Grade 2	Langdon	" 6	" 6	0	7	15	0	15	7
John Baer	Steele, Briggs	" 6	" 6	0	7	14	0	14	7
Chalks Early Jewel	Steele, Briggs	" 12	Aug. 13	0	6	18	0	18	6
Jewel	Langdon	" 21	Sept. 6	0	5	13	8	13	13
Alacrity x Earlibell	O-9723	" 6	Aug. 7	0	5	11	0	11	5
Pink No. 1	O-6573	" 6	" 7	0	4	16	0	16	4
Marglobe	Stokes	" 19				20	12	20	12
L.G. B.B	O-11392	" 7				13	10	13	10
Monumental	Bolgiano	" 16				12	12	12	12
Red Rock	Langdon	" 23				9	4	9	4
Alacrity x Earlibell	O-6572	" 6				8	0	8	0

TOMATO.—Early Ripening—Project H-600.

TOMATO—Increasing Production—Project H-601.

These projects are for the present not being conducted. More satisfactory methods of procedure are being sought, so that results can be more justly attributed to treatments applied. They will however be continued in due course.

TURNIPS—Variety Test.—Only three varieties of turnips were grown, these being Purple Top Milan, Red Top Strap Leaf and Red Top White Globe. The first-named variety was earliest by about ten days, the roots being of splendid quality, and averaging about three inches in diameter on July 18 from seed sown on May 4. The last named variety was similar to Purple Top Milan but later, while Red Top Strap Leaf proved to be a late, coarse, turnip with strong upright tops.

VEGETABLES—Fall vs. Spring Seeding.—Project H-218.—From trials extending over a number of years, fall seeding has been successful with carrots, onions and lettuce, reasonably so with beets, turnips and radishes, and un-

successful with cabbages. Most crops from fall sown seed are earlier by as much as 14 days, and usually of better quality than those from spring sown seed. The essential caution to observe is that the seed does not germinate in the fall. It should therefore be sown immediately before or immediately after freeze-up in a seed bed previously pulverized and prepared.

WATERMELONS—Variety Test.—As in 1927 Peerless or Ice Cream was the only variety grown. Early sowing of seed indoors was practised, and transplanting to the garden accomplished on June 6. No fruits matured however, the growing season being comparatively short owing to injurious frosts before the end of August.

FLORICULTURE

ANNUALS

In a comparison of spring and fall preparation of soil for sweet peas the only difference noted was that where the soil was trenched in the fall, the surface was more mellow and in finer tilth when seed was sown on May 7. A support of chicken wire was provided when the plants were a few inches high, and blossoming commenced on July 21.

Varieties mentioned at this time are considered valuable for the home garden. The first to bloom were Valentine (pink), Campfire (red), Wembley (mauve), Constance Hinton (white), Matchless (cream), Joan Ryder (white), and Royal Purple (purple). Later to bloom were Powerscourt (mauve), Annie Ireland (picotee), The Sultan (maroon), Austin Frederick (mauve), Bridesmaid (pink) and Charity (crimson). Still later were Warrior (maroon), White Perfection (white), Royal Scot (scarlet) and Doris (cerise).

The practice of sowing sweet pea seed in the fall prior to freeze-up was tested, but in no variety did any seeds germinate in the spring. A covering of strawy manure was also provided for protection during winter.

Spring-germinated volunteer seedlings of *leptosyne stillmani, clarkia, godetia, calendula officinalis* and Shirley poppy made a good showing. The ground on which these annuals had grown in 1927 was undisturbed, other than that old flower stems and weeds were removed by hand pulling. These also came into bloom more than sixteen days earlier than other annuals sown outdoors in the spring. Volunteer seedlings which had germinated before winter from 1927 plants all winter-killed.

Hardy annuals sown outdoors on June 6 bloomed from July 23 onwards in the following order: *Bartonia aurea, leptosyne stillmanii, linaria* (mixed), *clarkia elegans, calendula officinalis,* sweet sultan, shirley poppy and alyssum.

Half hardy annuals, valuable for providing colour and blossoms in late summer are: *ageratum, antirrhinum* (dwarf and intermediate), **acroclinum, arctotis grandis,* balsam, cosmos, chrysanthemum, dahlia, **helichrysum, kochia,* larkspur, lobelia, marigold (African and French) *matricaria, nemesia, nicotiana,* petunia (single and double), *phlox Drummondii, portulaca, salpiglossis, scabious, schizanthus, *statice sinuata hybrida,* stock, *tagetes,* verbena and zinnia.

Aster is not included in the list. In tests for the control of aster wilt, soil sterilization in the fall, and in the spring, respectively, by the use of formalin yielded negative results.

PERENNIALS

Recommended varieties of all herbaceous perennials were given in the 1927 annual report.

* These are everlastings.

Blossoming dates of irises were little different from those of previous years. The size and quality of the blooms and spikes were, however, poorer than formerly, due, no doubt, to lack of moisture in May.

Root portions of over twenty new iris varieties were received from the Central Experimental Farm, Ottawa, and planted on September 22. At that time root growth characteristically active following the blossoming period had ceased.

Most peonies were in bloom a few days earlier than in past years. The length of the blossoming season was also somewhat shorter but some splendid blooms were produced. A suitable method of supporting peonies is to tie the stems loosely to short, stout, stakes driven into the ground behind the roots.

In the early winter snow fell before a winter mulch had been applied to the peonies. It was therefore decided to let them pass the winter without it, and despite the fact that the ground was bare on March 21, no apparent injury to the roots resulted. No replanting of the peony border was done, neither were any new varieties added.

Rapid and early spring growth were outstanding features of the following herbaceous perennials: *aconitum, aquilegia,* chrysanthemum, *delphinium, dianthus, eryngium, fraxinella, hemerocallis, lilium dauricum, lychnis, papaver, phalaris, polemonium, pyrethrum, rudbeckia, sedum,* and *veronica.* Others did not make much growth until after May 15. Rotted manure was again applied as a top-dressing, and, through this means, the soil remained moist and friable during most of the summer. Weed growth also remained insignificant.

Of the herbaceous perennial seedlings which had germinated before winter, from seed sown outdoors on August 12, 1927, only those of *eryngium* and the aquilegia varieties were alive in spring. Clean straw which was removed on April 30, was also placed over these seedlings before the snow had disappeared.

It would seem, therefore, that for the propagation of herbaceous perennials from seed, spring or early summer sowing under suitable conditions to induce germination should be adopted. Transplanting into flats should follow, and by the middle of August the seedlings should be set out at least twelve inches apart in a nursery row. If fall sowing of seed outdoors is desired do so late enough to prevent the seed germinating before spring.

ROSES

Little was done with roses in 1928. A new border was prepared, however, and in it a good variety of hardy roses will be planted in 1929. Of the varieties removed from the old border and heeled-in over winter F. J. Grootendorst (red) and Mrs. Geo. Bruant (white) suffered least injury.

TULIPS

Early flowering tulips were generally unsatisfactory owing to the drought in May. They began to blossom about the same time as in other years, but in ten days the blooms had practically all opened and faded. In the home garden where only a small number are grown, they may be watered, should the soil become dry.

HEDGES, ORNAMENTAL TREES AND SHRUBS

The sample hedges continue to attract a great deal of attention. Varieties recommended for general and ornamental hedge planting have been given in previous reports.

It should be remembered that regular pruning must be done, once or twice a year, and untidy, unpruned hedges can, by cutting down to four or five feet high, be made compact and decorative.

Records of growth and descriptions of ornamental trees and shrubs at this farm were given in "Seasonable Hints", (Prairie Edition) July, 1928. From these details the suitability of the various varieties for planting in clumps or as individual specimens can be determined.

Note also the season of blossoming so that a continuity of bloom may be had. Seed pods or fruits of various sizes, shapes, and colours are also produced by cotoneasters, crab-apples, dogwoods, flowering currants, hawthorns, honeysuckles, maples, mountain ash, roses, Saskatoon and viburnums. The various shades of evergreen species should also be considered when planting for home beautification.

Over two hundred plants representing different varieties and species of ornamental trees and shrubs will be contained in the new arboretum. Half of these were planted in 1928. The remainder will be added as they become available.

Despite the dry conditions, only one or two plants failed to grow. A spadeful of soil saturated with water was placed immediately over the roots at planting time. This was believed to account for so many becoming established. Trees and shrubs can be planted with reasonable safety any time up to the end of May, provided too much growth has not been made.

POULTRY

Progress in the breeding, selection, and improvement in the flock of White Wyandottes at the Experimental Farm, Indian Head, was temporarily interrupted during 1928. Owing to the presence and spread of B.W.D. in the flock, the destruction of the old and breeding stock was deemed advisable. This was accomplished at the close of the breeding season.

Two hundred day-old chicks were purchased from H. A. Gilroy, Chemainus, B.C., during the first week in May. Development of these during the summer was satisfactory though not rapid. For profitable winter egg production and yearly egg production it is felt that pullets should not commence laying until the latter part of October, when they can be placed in their winter quarters. If this is done there is less likelihood of them sustaining interruptions once they begin laying. This observation is based on the performance of birds that have been laying heavily before entering laying contests, and also upon records of very early laying pullets.

NINTH SASKATCHEWAN EGG LAYING CONTEST

With the close of the Ninth Saskatchewan Egg Laying Contest poultry registration extended into a number of new flocks in Saskatchewan. While it is regrettable that a number of breeders whose names have become almost integral parts of the Saskatchewan Contest did not participate during the past year it is hoped that these will again take advantage of this very important service for the benefit of the poultry industry in Saskatchewan.

This contest commenced on November 1, 1927, with the following entries: 15 Barred Plymouth Rocks, 10 Single Comb White Leghorns, 7 White Wyandottes, 2 Single Comb Anconas and 1 Single Comb Rhode Island Reds. During the contest it was considered advisable by owners and the management to withdraw a number of pens, so that there were competing at the close of the contest 13 pens Barred Plymouth Rocks, 10 pens Single Comb White Leghorns, 4 pens White Wyandottes, and 1 pen each of Single Comb Anconas and Single Comb Rhode Island Reds. This contest also concluded at the end of the fifty-first week, one week earlier than previous contests had ended.

The leading pen in the Ninth Saskatchewan Egg Laying Contest was the Single Comb Rhode Island Red entry from the University of British Columbia. This pen had a score of 2,036 eggs and 2,157·4 points, or an average of 203·6 eggs weighing 25·4 ounces to the dozen. The leading Saskatchewan entry was the Barred Plymouth Rock pen of Mrs. Jas. E. Byrne, Welwyn, Sask. with a total of 2,022 eggs and 2,069·9 points.

REGISTRATION

Thirty-eight birds qualified for registration in the Ninth Saskatchewan Egg Laying Contest, in which number all breeds were represented, with the exception of the Single Comb Anconas.

RECORDS OF BIRDS WHICH QUALIFIED FOR REGISTRATION IN SASKATCHEWAN EGG-LAYING CONTEST, 1927-28

Bird No.	Owner	Breed	Date first egg	Date last egg	Days in production	Total eggs laid	Per cent production
15	Miss H. M. Purdy, Aspenridge Farm, Balcarres, Sask.	B.P.R.	Nov. 3	Oct. 17	350	219	62·5
27	H. Barton, Davidson, Sask.	B.P.R.	Nov. 25	Oct. 21	332	228	68·6
28	" "	B.P.R.	Nov. 15	Oct. 13	334	206	61·6
32	" "	B.P.R.	Dec. 20	Oct. 17	303	217	71·6
33	" "	B.P.R.	Nov. 2	Oct. 16	350	242	69·1
35	" "	B.P.R.	Dec. 8	Oct. 16	314	203	64·6
39	" "	B.P.R.	Jan. 4	Oct. 21	292	217	74·3
56	T. Hampson, Birch Hills, Sask.	B.P.R.	Dec. 25	Oct. 8	287	208	72·4
62	Mrs. Jas. E. Byrne, Welwyn, Sask.	B.P.R.	Dec. 29	Oct. 22	299	216	72·2
63	" "	B.P.R.	Jan. 9	Oct. 21	287	203	70·7
69	" "	B.P.R.	Dec. 17	Oct. 22	311	214	68·8
*112	E. Armstrong, Lockwood, Sask.	B.P.R.	Dec. 30	Oct. 22	298	244	81·8
117	" "	B.P.R.	Nov. 18	Oct. 20	338	211	62·4
126	Mrs. Mel. Clark, Waldron, Sask.	B.P.R.	Nov. 7	Oct. 7	334	230	68·8
203	Experimental Station, Lacombe, Alta.	W.W.	Nov. 1	Oct. 22	357	222	62·1
212	Fred Finch, Lanigan, Sask.	W.W.	Nov. 1	Oct. 22	357	200	56·0
544 Spare	C. N. Fisher, Davidson, Sask.	W.W.	Nov. 1	Oct. 22	357	200	56·0
273	University of British Columbia, Vancouver, B.C.	S.C.R.I.R.	Nov. 6	Oct. 21	351	228	64·9
276	" "	S.C.R.I.R.	Dec. 15	Oct. 22	313	235	75·0
278	" "	S.C.R.I.R.	Nov. 1	Oct. 19	354	242	68·3
279	" "	S.C.R.I.R.	Nov. 2	Oct. 18	352	213	60·5
553 Spare	" "	S.C.R.I.R.	Jan. 9	Oct. 21	287	200	69·6
554 Spare	" "	S.C.R.I.R.	Nov. 7	Oct. 18	347	211	60·8
304	Mrs. Leonard W. Draper, Welwyn, Sask.	S.C.W.L.	Dec. 4	Oct. 20	322	211	65·5
560 Spare	" "	S.C.W.L.	Nov. 5	Oct. 9	340	222	65·2
311	" "	S.C.W.L.	Nov. 2	Oct. 21	355	249	70·1
316	" "	S.C.W.L.	Nov. 2	Oct. 21	355	229	64·5
319	" "	S.C.W.L.	Jan. 23	Oct. 22	274	214	78·1

* Highest individual in contest on the basis of points awarded (289.0).

RECORDS OF BIRDS WHICH QUALIFIED FOR REGISTRATION IN SASKATCHEWAN, ETC.—*Con.*

Bird No.	Owner	Breed	Date first egg	Date last egg	Days in production	Total eggs laid	Per cent production
328	F. W. Mahon, 2026 Arthur St., Regina, Sask.	S.C.W.L.	Nov. 1.	Oct. 22.	357	200	56·0
338	J. S. Hopkins, 1407 Spadina Crescent E., Saskatoon, Sask.	S.C.W.L.	Nov. 17.	Oct. 22.	341	206	60·4
354	Bolivar Leghorn Farm, Cloverdale, B.C.	S.C.W.L.	Nov. 6.	Oct. 12.	342	215	62·8
359	" "	S.C.W.L.	Nov. 9.	Oct. 21.	348	248	71·2
570	" "	S.C.W.L.	Feb. 1.	Oct. 13.	256	206	80·4
Spare							
367	M. Ridley, 1345 Redland Ave., Moose Jaw, Sask.	S.C.W.L.	Dec. 18.	Oct. 13.	301	206	68·4
372	B. C. Plewes, 1245-3rd Ave. N.E., Moose Jaw, Sask.	S.C.W.L.	Nov. 1.	Oct. 21.	356	232	65·1
373	" "	S.C.W.L.	Jan. 8.	Oct. 21.	288	207	71·8
376	" "	S.C.W.L.	Nov. 1.	Oct. 22.	357	241	67·5
385	J. P. L. McFee, 1110 Elgin Ave., Moose Jaw, Sask.	S.C.W.L.	Nov. 6.	Oct. 16.	346	216	62·4

General satisfaction has been expressed at the group system of housing in the contest, where five pens of birds occupy a compartment 16 by 16 feet in area (approximately four square feet of floor space per bird). No outbreaks of disease have yet been experienced and it is believed that under this system of housing the birds get the maximum of exercise, light penetrates freely, greater uniformity in feeding and care is possible, there is less duplication of equipment, and more efficient management can be given. Some of these features are extremely important in contest work where the aim is to give all birds equal and similar attention.

For the past two years the feeds used in the Saskatchewan Egg Laying Contests have varied very little. The importance of allowing birds in heavy production access to unlimited quantities of shell and charcoal as well as mash and clean water, cannot be over-emphasized. Attention to filling these containers regularly, is well repaid by a reduction in losses from sickness.

A slight change in the mineral supplement fed during the winter months was made. Herewith is given the constitution of that used in the Ninth Saskatchewan Egg Laying Contest.

Bone flour	60 pounds
Calcium carbonate	23 pounds
Salt	20 pounds
Sulphur	5 pounds
Oxide of iron	2 pounds
Potassium iodide	4 ounces

This supplement was added to the mash at the rate of 45 pounds per 1,000 pounds of mash.

That feeds used in the Ninth Saskatchewan Egg Laying Contest were satisfactory, the results at the close of the contest testify. Production for the last week of the contest dropped off considerably, but for the fiftieth week the production for all birds was 33·20 per cent. The average weight of birds representing heavy breeds at the end of the contest year was 6·20 pounds (207 birds), and that of birds representing light breeds 4·14 pounds (109 birds).

ENTOMOLOGICAL BRANCH

The major work of the officer stationed at the Dominion Entomological Branch Laboratory at the Experimental Farm, Indian Head, during the past year has been the investigation of shade tree insect conditions.

The fundamental principles of this study are the determination of the necessity of feasibility of control measures in infested areas and the most advantageous method of control to be employed in each case.

Information on these two points is being gained principally by a study of the insects in relation to their environment. The "Biotic potential of species" is being balanced against the resistance of environment and all data obtained are being estimated quantitatively and collated by mathematical methods.

A project of this nature has of necessity to be extended over a period of several years before final and definite results may be obtained. However, a great deal of information has already been accumulated which promises to be of considerable value.

An outstanding feature of last year was the absence of any serious outbreaks of shade tree insects.

LABORATORY OF PLANT PATHOLOGY

THE POTATO INSPECTION AND CERTIFICATION SERVICE

The Potato Inspection and Certification Service of the Division of Botany for the Prairie Provinces is stationed at the Experimental Farm, Indian Head, Sask. The staff consists of two permanent district inspectors, one for Manitoba and Eastern Saskatchewan, one for Western Saskatchewan and Alberta, and two seasonal inspectors to assist with field inspection.

A large office is provided by the Experimental Farm as well as land for experimental plots and horse-labour for cultivation of these plots. In the winter greenhouse space is also provided by the Experimental Farm for the study of potato diseases.

In 1928 there were approximately 640 acres of potatoes inspected in the three Prairie Provinces of which almost 400 were certified and the remainder rejected, mostly for the presence of disease. In addition to inspection of potatoes experimental work on certified seed was carried on.

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