DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

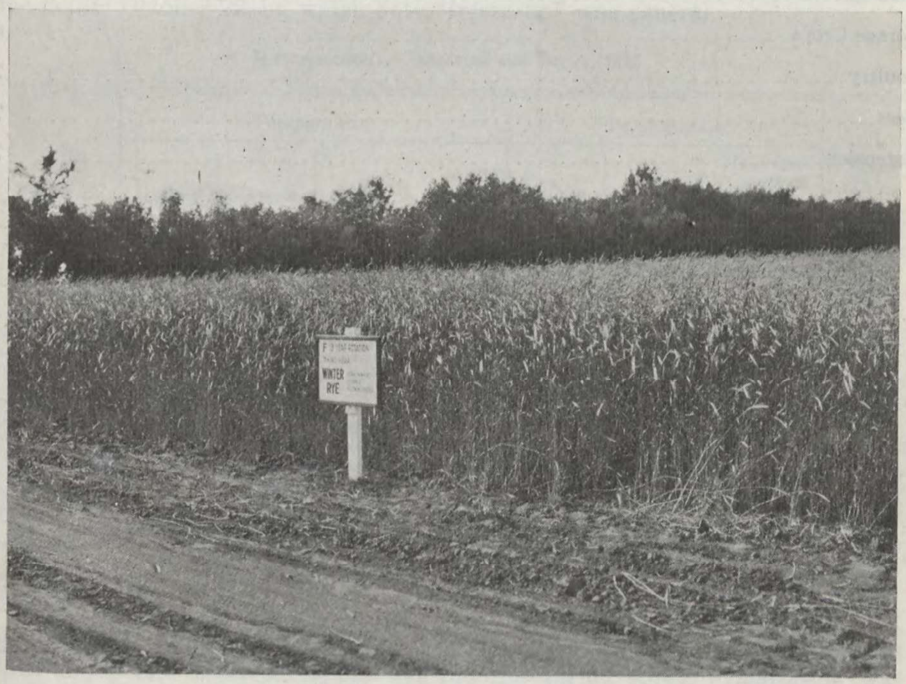
EXPERIMENTAL STATION

SCOTT, SASK.

REPORT OF THE SUPERINTENDENT

VICTOR MATTHEWS, B.S.A.

FOR THE YEAR 1925



Dakold winter rye sown in wheat stubble following the binder.

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THE SEASON

The winter of 1925 was particularly severe. The mean temperature for the month of January was -2.64 and the month of February -1.02. The lowest temperature recorded was in February when the reading was -48.3.

Spring work on the land started about a week earlier than normally, and excellent weather for the development of crops prevailed until the latter part of July. For the first ten days of August the early-sown grain crops suffered from hot drying winds with the result that the grain ripened too quickly to "fill" well.

The first week of the threshing season had fairly favourable weather. After the middle of September rains seriously delayed threshing and injured the quality of the wheat in the district. Briefly, 1925 was one of the worst falls for threshing this district has ever experienced.

Owing to the unfavourable threshing weather, very little fall ploughing was done before October 22, on which date "freeze-up" was general.

METEOROLOGICAL RECORDS FOR SCOTT, 1925

Month	Temperature				Precipitation				Total Sunshine
	Highest	Lowest	Mean	Rainfall	Snowfall	Total	Heaviest in 24 Hours (Inches)		
	° F.	° F.	° F.	Inches	Inches	Inches	Rain	Snow	Hours
January	35·5	−40·0	−2·64	....	9·4	0·94	......	6·0	92·3
February	38·9	−48·3	−1·02	....	10·8	1·08	......	4·0	87·2
March	40·5	−34·5	13·01	0·36	4·5	0·81	......	1·9	114·1
April	70·9	22·5	40·68	1·10	3·1	1·41	0·60	2·5	229·0
May	88·4	18·0	50·93	1·51	....	1·51	0·79	......	283·0
June	80·6	31·2	55·99	3·48	....	3·48	1·32	......	281·4
July	89·0	36·2	61·84	2·68	....	2·68	1·90	......	319·2
August	91·0	36·5	59·21	1·31	....	1·31	0·69	......	260·9
September	87·0	25·5	50·77	1·95	1·0	1·95	1·40	......	170·5
October	61·3	−2·0	29·87	0·47	2·5	0·72	0·35	1·2	137·6
November	49·7	−15·0	22·83	None	3·0	·30	......	2·0	97·4
December	47·3	−34·0	13·21	0·10	4·6	0·56	0·10	4·0	53·5
Totals	....	....	....	12·96	38·9	16·75	......	......	2,126·1

The loss of moisture by evaporation in this district is considerable. As compared with the precipitation the evaporation from a water-surface was 11.64 inches above that received in the five months during which evaporation was recorded. At no time during 1925 was evaporation sufficiently rapid to cause excessive wilting of any of the growing crops.

The precipitation at Scott for the crop-year August 1924 to August 1925 was 19.11 inches which was 5.35 inches above the average for the past fourteen years. The precipitation during the months of April, May, June and July was 2.59 inches above the average for the same period. The frost-free period, that is, the length of time between the last frost in the spring and the first frost in the fall was 101 days, being eleven days more than the average for the past fourteen years. The number of crop-days, that is, the period between the last killing frost in the spring and the first killing frost in the fall was 139 days, being twenty-four more than the average for the fourteen-year period.

The dates of Farm operations at the Experimental Station will give a general idea of the character of the season.

FARM OPERATIONS

Dates of Farm Operations	Begun	Finished
Work on land	April 9	Oct. 22
Seeding wheat	" 17	May 5
" oats	" 29	" 15
" barley	May 14	" 16
" corn	" 14	" 14
" sunflowers	" 21	" 23
Planting potatoes	" 19	" 19
Seeding fall rye	Aug. 2	Aug. 2
Spring ploughing	April 9	May 11
Ploughing summerfallow	June 11	June 20
Cultivating summerfallow	" 23	Sept. 15
Breading prairie sods	May 28	June 12
Cutting hay	July 8	July 30
Cutting fall rye	Aug. 1	Aug. 1
" wheat	" 12	Sept. 3
" oats	" 18	" 1
" barley	" 18	Aug. 26
Ensiling sunflowers	" 26	Sept. 10
" corn	" 29	Aug. 31
Digging potatoes	Sept. 19	Oct. 2
Threshing	" 1	" 15
Fall ploughing	Oct. 9	" 22

PRECIPITATION AT SCOTT, SASK.

	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	Average 14 years
January	0·37	0·59	0·65	0·10	1·25	0·60	0·77	0·72	1·30	0·52	0·40	0·35	0·11	0·94	0·61
February	0·62	0·42	0·03	0·15	0·50	0·15	0·49	0·30	0·27	0·80	0·42	0·52	1·10	1·08	0·48
March	0·23	0·23	0·20	0·05	1·05	0·03	0·57	0·90	1·25	0·95	0·40	0·22	1·10	0·81	0·56
April	0·00	0·15	1·36	0·90	0·52	1·10	0·58	0·79	0·61	2·54	0·79	0·29	1·02	1·41	0·85
May	2·28	0·95	1·15	1·40	2·52	0·41	0·21	0·88	0·55	1·39	2·03	0·94	1·10	1·51	1·23
June	2·19	1·28	2·37	3·54	4·23	0·88	0·29	0·91	2·47	1·66	0·87	5·67	0·58	3·48	2·17
July	6·16	2·98	1·80	2·11	4·03	1·03	1·87	0·75	3·74	1·65	0·26	4·25	0·70	2·68	2·42
August	2·93	2·62	1·41	0·48	3·87	1·78	0·93	2·56	2·37	0·56	3·04	1·45	2·87	1·31	2·00
September	2·01	1·24	3·51	0·98	1·66	0·46	0·19	1·56	1·49	2·51	0·56	0·65	1·60	1·95	1·44
October	0·15	0·46	3·17	0·25	0·50	0·13	0·32	1·22	0·54	......	0·99	0·32	0·31	0·72	0·64
November	0·20	0·25	0·60	0·40	0·05	0·25	0·10	0·15	0·36	0·67	0·07	0·06	1·11	0·30	0·31
December	0·27	0·08	1·80	0·10	0·50	0·55	0·27	0·42	0·45	0·23	0·55	0·30	0·95	0·56	0·49
Totals	17·41	11·25	18·05	10·46	20·77	7·37	6·59	11·16	14·40	13·48	10·38	15·02	12·56	16·75	13·02

EXTREME HIGHEST, EXTREME LOWEST AND MEAN TEMPERATURES AT SCOTT, SASK., 1912–25

Month	1925			1924			1923			1922		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.
January	35·5	−40·0	−2·64	41·6	−44·0	−2·11	37·0	−27·0	4·04	35·8	−47·8	0·54
February	38·9	−48·3	−1·02	47·0	−33·0	13·28	41·2	−40·0	0·73	23·3	−34·6	−5·56
March	40·5	−34·5	13·01	36·0	−23·5	17·66	37·5	−22·0	12·45	38·5	−18·8	15·76
April	70·9	22·5	40·68	66·4	6·9	32·98	79·8	−6·0	36·56	71·6	7·7	38·77
May	88·4	18·0	50·93	83·7	18·6	45·97	85·0	19·3	50·19	87·8	24·2	50·84
June	80·6	31·2	55·99	83·5	29·5	54·07	85·0	3·9	59·86	87·5	31·4	58·63
July	89·0	36·2	61·84	94·0	34·5	63·57	84·8	no	record	89·3	32·4	61·07
August	91·0	36·5	59·21	83·7	35·1	57·39	84·2	35·8	58·08	98·0	36·2	63·26
September	87·0	25·5	50·77	83·6	24·3	52·09	85·6	22·1	51·18	87·2	25·2	54·23
October	61·3	−2·0	29·87	69·7	11·3	42·79	74·3	7·6	42·81	70·0	15·9	39·43
November	49·7	−15·0	22·83	46·2	−15·0	19·57	60·2	0·9	28·56	53·2	−7·8	25·37
December	47·3	−34·0	13·21	41·1	−47·5	5·31	48·4	34·1	15·36	38·8	−32·8	4·79

Extreme Highest, Extreme Lowest and Mean Temperatures at Scott, Sask., 1912–25

Month	1921			1920			1919			1918		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
	F	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.
January	38·8	−26·7	6·28	30·3	−41·0	−3·56	40·8	−29·3	14·21	36·8	−42·8	−4·70
February	47·8	−37·8	8·51	35·5	−20·8	11·60	36·8	−46·3	−2·52	38·0	−43·0	2·93
March	39·7	−26·6	10·69	41·8	−26·8	14·61	38·3	−33·8	5·01	60·0	−25·2	20·69
April	57·5	−1·8	32·47	51·0	−20·8	25·90	71·8	8·7	41·89	74·8	3·2	41·15
May	80·5	26·2	50·46	79·5	24·2	50·17	92·3	19·0	53·18	79·8	15·6	45·17
June	84·5	26·7	60·96	80·3	29·4	56·47	96·8	20·2	62·04	95·2	27·2	60·98
July	99·3	40·2	63·45	96·8	37·7	63·85	99·6	36·7	64·64	97·8	27·2	61·60
August	91·6	32·5	60·39	90·8	29·4	63·51	90·1	39·2	62·89	92·8	35·2	61·20
September	74·6	26·7	47·30	80·8	27·0	51·64	78·8	19·9	52·21	81·8	17·4	49·65
October	75·5	16·7	42·82	79·5	15·2	40·57	68·8	−19·8	26·32	70·4	8·2	40·38
November	53·3	−18·8	15·01	51·0	−5·8	23·78	44·3	−29·8	9·22	49·8	−4·8	25·64
December	40·8	−36·8	7·69	42·8	−20·8	13·06	39·8	−33·3	5·14	37·8	−28·8	12·72

Extreme Highest, Extreme Lowest and Mean Temperatures at Scott, Sask., 1912–25

Month	1917			1916			1915			1914		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.	F.
January	43·0	−41·8	−3·56	16·0	−55·4	−18·11	31·8	−42·8	−0·41	37·8	−40·1	2·55
February	39·8	−49·6	−5·91	48·8	−32·8	4·86	29·8	−10·8	7·57	37·0	−46·6	−5·71
March	37·6	−31·2	13·84	43·0	−28·4	11·26	44·8	−5·8	19·76	43·8	−21·9	18·35
April	48·6	5·0	31·72	74·0	9·1	37·29	76·6	20·2	48·58	76·5	9·1	37·8
May	89·2	19·2	51·22	77·6	17·8	45·23	75·8	26·6	51·03	82·0	18·4	49·1
June	89·8	25·6	55·04	77·8	32·5	54·65	74·8	29·5	53·29	85·0	34·1	56·9
July	93·8	37·2	63·09	86·8	38·0	63·37	80·4	32·8	58·66	96·8	37·2	67·1
August	89·8	34·7	59·80	82·8	30·2	57·15	91·6	31·0	64·57	90·5	30·2	59·5
September	85·6	23·0	52·19	78·1	20·2	49·28	78·8	9·0	46·90	80·0	20·0	50·25
October	69·0	−4·0	33·93	67·6	0·4	36·29	68·3	14·2	41·25	69·9	18·2	41·60
November	64·6	1·2	36·69	63·8	−2·2	26·75	51·2	−12·8	19·14	51·8	−17·5	23·69
December	27·8	−43·8	−11·86	47·0	−31·8	0·90	38·2	−13·8	12·40	24·8	−23·3	2·72

EXTREME HIGHEST, EXTREME LOWEST AND MEAN TEMPERATURES AT SCOTT, SASK., 1912–25

Month	1913			1912		
	Highest	Lowest	Mean	Highest	Lowest	Mean
	F.	F.	F.	F.	F.	F.
January	38·8	−48·8	8·68	31·8	−48·3	−15·3
February	38·8	−35·4	3·33	36·5	−33·1	6·28
March	46·0	−35·6	11·08	46·0	−31·8	5·41
April	79·0	14·1	43·23	68·5	12·3	40·65
May	84·9	18·2	45·6	85·0	26·0	48·43
June	90·1	28·7	58·05	95·5	28·7	61·71
July	87·4	35·2	57·9	88·0	34·0	58·0
August	86·1	34·3	59·89	81·0	29·1	59·7
September	86·0	20·1	51·24	74·5	15·7	45·6
October	72·0	−5·4	32·99	75·0	14·2	39·1
November	54·8	−8·8	23·90	47·0	8·2	27·0
December	40·5	−12·8	15·57	44·1	−19·8	16·7

SUNSHINE RECORD AT SCOTT FOR 14 YEARS 1912–25

Month	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	Average
January	100·8	83·9	96·6	89·0	65·2	78·3	62·5	79·1	100·7	93·3	91·9	97·6	82·6	92·3	86·7
February	97·3	104·4	128·5	111·5	153·3	127·4	111·1	89·7	118·7	104·6	132·8	157·4	109·5	87·2	116·6
March	199·0	154·4	157·9	216·7	149·7	194·3	168·1	168·7	135·3	154·3	128·9	133·2	131·1	114·1	157·5
April	235·9	238·1	184·5	286·8	178·8	134·0	241·3	206·9	175·4	232·5	186·9	244·6	203·5	229·0	212·7
May	255·5	247·3	295·4	264·0	200·7	300·7	252·9	285·1	266·2	221·8	260·9	309·5	282·5	283·0	266·1
June	343·0	220·1	211·0	208·4	254·5	294·1	314·8	333·8	246·9	323·4	285·6	238·0	275·8	281·4	274·0
July	183·5	282·3	309·0	258·9	286·8	363·0	323·4	328·0	327·6	317·7	333·2	313·1	316·1	319·2	304·4
August	192·5	238·8	235·1	309·7	254·0	284·2	266·3	267·6	281·2	303·3	235·8	292·5	218·2	260·9	260·0
September	132·7	234·5	192·8	145·7	138·7	180·4	177·6	162·6	221·3	160·3	217·3	216·1	180·3	170·5	180·7
October	161·0	137·0	143·7	168·1	123·9	126·6	113·7	100·7	185·9	167·8	147·2	220·4	163·3	137·6	149·7
November	84·9	108·8	100·4	113·7	116·6	151·1	111·0	115·3	87·8	75·1	107·5	134·2	85·4	97·4	106·3
December	91·3	101·1	26·3	72·0	104·0	67·8	96·3	102·6	63·0	95·7	78·8	105·8	80·2	53·5	81·3
Totals	2,077·4	2,150·7	2,081·2	2,244·5	2,026·2	2,301·9	2,239·0	2,240·1	2,210·0	2,249·8	2,206·8	2,462·4	2,128·5	2,126·1	2,196·0

ANIMAL HUSBANDRY

The experimental work in animal husbandry is under the supervision of Mr. E. Van Nice, Assistant to the Superintendent. Mr. Van Nice has also charge of the poultry and cultural experiments.

HORSES

Fourteen pure-bred bred Percheron mares and gelding, and ten grade work horses were on hand at this Station at the end of December, 1925.

The Station has been a member of the Scott Percheron Horse Breeders' Club for the past five years, which is organized under the federal assistance plan. The Superintendent or his Assistant has acted as secretary-treasurer of the club since its organization.

No experimental work has been conducted with horses during the past year. The mares in foal were given a small teaspoonful of potassium iodide in their feed twice per month as a preventive against joint-ill in the foals.

CATTLE

The work with cattle consists chiefly in selecting and feeding of a pure-bred Shorthorn herd for higher milk-production and at the same time maintaining a desirable beef type. The less productive females are sold after the first lactation period and the more promising individuals are retained for breeding purposes.

During the past twelve months eight bull calves have been sold to farmers living within the territory served by this Station and in addition an aged bull, Major Mayflower —156355—, was sold to the Dominion Live Stock Branch and was placed about 50 miles north of this Station. This bull was born on the Station and was used for herd-sire for two years. The dam has a record of 7,882 pounds of milk and is still maintained at the Station.

The sire used at present is Brandon Morello —144190—; Dam, Brandon Janet 5 —162536—; milk-record 10,029 pounds; grand-dam, Ottawa Janet 4 —95004—; milk-record, 12,652 pounds.

In addition to developing a milking strain of Shorthorns a car of grade steers usually has been purchased in the fall for experimental feeding purposes.

STEER-FEEDING EXPERIMENT

The steer-feeding work during the winter of 1924-25 consisted of a comparison of roughages available to farmers in the district. Twenty two-year-old steers were purchased in November and divided into five lots of four each. The roughages compared consisted of upland prairie hay, oat sheaves, and sunflowers, fed at two rates, namely, fifteen and thirty pounds per day per head. In addition to the various roughages fed, the steers were given all the oat straw they would consume. One lot served as a check and received no other roughage than oat straw. The meal ration was the same for each lot. On November 27 the steers were started on three pounds of oat-chop per day. This quantity was increased and barley-chop and shorts were added gradually. The reason for using shorts was on account of a scarcity of barley. At the end of the feeding period each steer was eating 13.5 pounds per day of a chop made up of equal parts of oats, barley and shorts. During the last two weeks, the steers received a small quantity of commercial oil-cake meal. They were started on one-quarter pound per day and this was increased to one pound, which amount was fed during the last week of the feeding period. The steers consumed on an average one ounce of salt per day during the entire feeding period.

FEED, PRICE, AND TOTAL QUANTITY FED

—	Lot 1 — Prairie hay	Lot 2 — Straw *	Lot 3 — Oat sheaves	Lot 4 — Silage half ration	Lot 5 — Silage full ration
	lb.	lb.	lb.	lb.	lb.
Quantity of oats fed at 51c. per bush....	2,405	2,405	2,405	2,405	2,405
" barley fed at 72c. per bush. and crushing at $1.50 per ton.	2,371	2,371	2,371	2,371	2,371
" shorts fed at $1.10 per cwt...	424	424	424	424	424
" oil cake fed at $2.90 per cwt.	36	36	36	36	36
" sheaves fed at $7.50 per ton..	....	....	4,480	....	....
" hay fed at $9.00 per ton.....	4,480	....	....	....	....
" silage fed at $3.00 per ton ...	....	....	....	6,280	12,620
" oat straw fed at $2.00 per ton	3,200	7,120	3,168	5,008	4,656
" salt fed at $1.70 per cwt.....	27	30	29	31	34

AVERAGE DAILY RATION

—		Lot 1	Lot 2	Lot 3	Lot 4	Lot 5
Prairie hay......................	lb.	9·6	....	....	....	....
Oat straw........................	"	6·9	15·3	6·8	10·8	10·0
Oat sheaves......................	"			9·6	....	....
Sunflower silage.................	"	....	....	....	13·5	27·1
Chop.............................	"	11·3	11·3	11·3	11·3	11·3

STEER-FEEDING STATEMENT

—		Lot 1 — Prairie hay	Lot 2 — Oat Straw	Lot 3 — Oat sheaves	Lot 4 — Silage half ration	Lot 5 — Silage full ration
Number of steers in lot..............		4	4	4	4	4
First gross weight Nov. 27, 1924...	lb.	4,130	4,165	4,105	4,180	4,175
First average weight.............	"	1,032	1,041	1,026	1,045	1,044
Final gross weight, Mar. 23, 1925..	"	5,125	5,085	5,005	5,160	5,185
Final average weight.............	"	1,281	1,271	1,251	1,290	1,296
Total gain per steer in 116 days....	"	249	230	225	245	252
Average daily gain per steer.......	"	2·14	1·98	1·94	2·11	2·18
Total cost of feed................	$	104 74	88 55	101 38	95 88	105 09
Cost per 100 pounds gain..........	$	10 53	9 62	11 26	9 78	10 40
Initial cost of steers at $4.30 per cwt.	$	177 59	179 09	176 51	179 74	179 52
Initial cost plus cost of feed........	$	282 33	267 64	277 89	275 62	284 61
Market value f.o.b. Scott, Mar. 23, at $6 per hundred............	$	307 50	305 10	300 30	309 60	311 10
Profit per lot.....................	$	25 17	37 46	22 41	33 98	26 49
Profit per head..................	$	6 29	9 36	5 60	8 49	6 62

Deductions.—The highest returns were obtained from the steers receiving oat straw as a roughage. It must, however, be borne in mind that this is the result of only one test and that the oat straw fed contained considerable green second growth. Due to the peculiar crop season of 1924 the quality of the oat straw in northwestern Saskatchewan was much higher than normally.

Fifteen pounds of silage per day proved more economical than thirty pounds, thus substantiating the results of previous feeding trials.

Oat sheaves at $7.50 per ton was not as profitable a roughage as prairie hay at $9 per ton.

While the profits were not exceptionally high, this was largely the result of the high price of grain.

The twenty steers cost on an average at Scott $44.42. Adding to this the cost of the feed the total cost price when sold amounted to $69.20. The steers were worth $76.68 each when marketed leaving an average profit of $7.48 per head based on the valuation at Scott at the time of shipping to Great Britain.

MARKETING OF STEERS IN GREAT BRITAIN

The steers at the conclusion of the 116-day feeding period were consigned for export to Great Britain. They were shipped from Halifax on April 8, and included in shipment of 114 head of store cattle from the Experimental farms at Lethbridge, Alberta; Swift Current, Sask., Nappan, N.S., and Kentville, N.S.

The steers sold in England at a loss in weight or shrinkage in transit of 118 pounds per head or 9.3 per cent. It cost $19.25 per head to take steers to Halifax, this includes freight and other rail charges as well as attendant charges. It cost $47.56 per head to ship cattle from Scott to England, via Halifax. This amount was made up of all charges to port of debarcation. The cost of shipment to England was higher than that of the previous season. This was due to shipping from Halifax and hence the extra cost was made up almost entirely of increased rail-freight charges.

The total net receipts from shipping twenty head of Scott steers to Great Britain amounted to $1,753.97. The original cost of the steers was $888.40, while the cost of the feed was $495.60, leaving a total balance or net profit of $369.97. This represents a net profit of $18.50 per steer, sufficient to allow the farmer a good market price for his feed and wages at $92 per month for one quarter of his time during four months of the winter period taking care of and feeding one car of steers.

CALF-FEEDING EXPERIMENT

The object of this experiment was to compare the value of three different calf-meals when fed to young growing calves.

Nine young calves were divided as evenly as possible into three lots of three each according to weight and age. The ages varied from one week to three months when the experiment was started.

One lot received a commercial calf-meal known as Royal Purple, a second lot was given a home-prepared meal recommended by the Central Experimental Farm at Ottawa which consisted of finely ground oats 2 parts, corn meal 2 parts, and ground flax seed one part, and is called the Ottawa meal in this experiment. The third lot was fed a meal prepared at the Scott Station which was the same as the Ottawa meal except that the corn was replaced by finely ground barley.

The calves were taken from the cows when only a few hours old and were fed whole milk for two weeks. At this age skim-milk was added and thus the whole milk was gradually all substituted. In each case the meal was steeped in boiling water before it was added to the milk.

The concentrates fed in addition to the milk and calf-meal consisted of whole oats 2 parts, bran 3 parts, oil-cake meal 1 part. It will be noted in the following table that all feeds were fed in the same quantity to each lot of calves and that the only difference in the rations was the kind of calf-meal used.

CALF FEEDING

—		Royal Purple	Ottawa meal	Scott meal
Number of calves		3	3	3
First gross weight	lbs.	425	520	509
First average weight	"	141	173	169
Final gross weight	"	970	1,035	885
Final average weight	"	323	345	295
Total gain in 119 days	"	545	515	376
Average gain per head	"	181	171	125
Oats eaten at 51c. per bushel plus $1.50 per ton for crushing	"	142	142	142
Bran eaten at $1.15 per hundred	"	188	188	188
Oil cake eaten at $3.25 per hundred	"	64	64	64
Royal Purple calf-meal at $5.75 per hundred	"	173	....	....
Ottawa meal at $2.67 per hundred	"	....	173	....
Scott meal at $1.90 per hundred	"	....	....	173
Milk fed at 25 cents per hundred	"	4,130	4,130	4,130
Total cost of feed including milk	$	26 74	21 42	20 08
Total quantity of concentrates (not including calf-meal)	lbs.	394	394	394
Concentrates per 100 pounds pain	"	72	76	105
Calf-meal per 100 pounds gain	"	32	34	47
Cost of all feed per 100 pounds gain	$	4 91	4 15	5 34

Deductions.—The greatest gains were produced by use of the Royal Purple meal. The total cost of feed for 100 pounds gain was less when the Ottawa mixture was used. The Scott meal was cheaper but resulted in smaller gains hence the cost of feed per 100 pounds gain was higher. The calves in this lot were not thrifty which would indicate that barley is not a satisfactory substitute for corn in a calf-meal. The calves in the other two lots did well, as is indicated in the preceding table.

The Ottawa meal mixture gave good results and incidentally, is easily prepared on the average farm.

SHEEP

The breeds of sheep represented at this Station are the Rambouillet, Shropshire, and Cheviot. Each flock consists of about twenty-five grade ewes and a pure-bred ram, and in case of the Shropshire and Cheviot breeds a few additional pure-bred ewes form foundations for pure-bred flocks of each breed.

The average clip of wool per head for the entire flock of each breed is shown in the following table, together with the grading and gross price realized per hundred pounds of wool.

WOOL—GRADING AND PRICE

Breed	Average weight of clip	Average value of fleece as graded	Fine medium staple at 35c.	Medium staple at 30c.	Low medium at 29c.	Gross returns per hundred pounds as graded
	lb.	$	p.c.	p.c.	p.c.	$
Shropshire	7·7	2 27	....	60	40	29 60
Cheviot	7·9	2 30	3	3	94	29 21
Rambouillet	9·4	2 91	23	73	4	31 11

The Cheviots and Rambouillets were mostly first-cross from grade Shropshire ewes with a few second-crosses in the flock. The table following shows the comparative returns from the ewes of each breeding producing single lambs for the year of 1925.

RETURNS FROM TEN EWES, 1925

Breed	Gross value of fleece as graded	Average weight of lamb in November	Value of lamb as graded	Total returns per ewe
	$ cts.	lb.	$ cts.	$ cts.
Shropshire	2 27	83	9 73	12 00
Cheviot	2 30	81	9 72	12 02
Rambouillet	2 91	77	8 60	11 51

The wether lambs born in 1925 were marketed at Edmonton in November and were graded alive and on the rail after slaughtering. The grading alive was as follows: Shropshire, 87 per cent, No. 1; Cheviots, 100 per cent, No. 1; and Rambouillet, 59 per cent, No. 1. The remaining lambs in each case were graded "medium." The No. 1 lambs sold for 12 cents and the "mediums" sold for 10 cents per pound. These lambs were practically the same age and were in the same band during the summer.

The Rambouillet lambs seem a little slower to mature than the other two breeds, and when marketed in November were at a slight disadvantage, due to lack of finish. The average percentage of ewes producing twins during the past two seasons were: Shropshire, 45 per cent; Cheviot, 47 per cent; and Rambouillet, 48 per cent.

LAMB-FEEDING EXPERIMENT

The object of this experiment was to determine the value of sunflower silage for fattening lambs. Forty-four lambs were divided into two equal lots on November 14, 1924. A good grain ration was fed and oat straw was provided in racks. The feed was the same for both lots except that one lot received sunflower silage in addition to the grain ration and straw.

AVERAGE DAILY RATION FOR PERIOD

—	Silage lot	No silage lot
	lb.	lb.
Concentrates	1·2	1·2
Straw	2·0	2·7
Silage	1·2	....

It will be noted from the foregoing table that the lot getting silage did not consume as much straw as the check lot receiving no silage.

SILAGE VS. NO SILAGE

—		Silage lot	No silage lot
Number of lambs in lot	lb.	22	22
First gross weight Nov. 14	lb.	1,553	1,512
First average weight	"	70·6	68·7
Final gross weight	"	2,033	1,864
Final average weight	"	92·4	84·7
Total gain in 131 days	"	480	352
Average daily gain per head	"	0·166	0·122
Total concentrates consumed	"	3,589	3,589
Total cost of feed	$	66 35	61 12
Cost per 100 pounds gain	$	13 82	17 36
Concentrates per 100 pounds gain	lb.	747	1,019
Extra gain produced by silage	"	128	....
Returns from silage fed per ton	$	11 97	....

The 3,490 pounds of silage produced 128 pounds more gain than was made by the lot receiving no silage. It required 1,019 pounds of concentrates to produce a hundred pounds gain in the check lot which means that one ton of silage produced gains equivalent to 1,304 pounds of concentrates consisting of whole oats and barley and oil-cake meal. This mixture was worth 1·6 cents per pound. That is, $11.97 worth of concentrates was replaced by feeding one ton of silage. As one test is not sufficient from which to draw conclusions, a duplicate experiment is under way at time of writing this report.

FEED COST AND TOTAL AMOUNT OF FEED

—	Silage	No silage
	lb.	lb.
Quantity of oats fed at 51 cents per bushel	2,445	2,045
" barley fed at 72 cents per bushel	368	368
" shorts fed at $1.40 per hundred	460	460
" oil cake fed at $3.20 per hundred	324	324
" bran fed at $1.30 per hundred	392	392
" oat straw fed at $2 per ton	5,985	8,069
" sunflower silage fed at $3 per ton	3,490	....

The lambs in the feeding experiment consisted of wethers and ewe lambs. At the conclusion of the experiment most of the ewe lambs were retained in the flock for breeding purposes. All wethers were dressed and sold locally on account of lack of numbers to warrant shipping to the Edmonton or Winnipeg market. For this reason the lambs returned more than if shipped and sold alive, therefore, it was thought advisable not to show a financial statement.

PREVENTION OF GOITRE IN LAMBS

Previous to feeding potassium iodide to the ewes during the gestation period, the loss of lambs from goitre in some years was very heavy. Several experiments previously conducted and reported have shown that two per cent of potassium iodide fed in the salt during pregnancy, has been effective in controlling goitre in lambs. Later, similar results were obtained by feeding one per cent of potassium iodide in the salt.

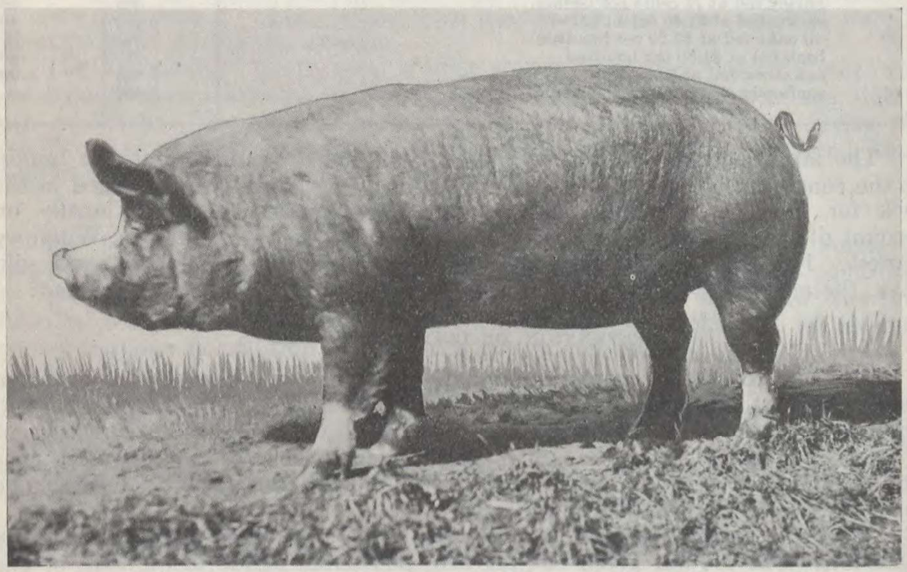
After the breeding season in the fall of 1925, the ewes were divided into three lots. One lot was given one per cent potassium iodide in the salt, or one pound to ninety-nine pounds of salt. Another lot was given only one ounce in one hundred pounds of salt; and a third lot was used as a check and was supplied with salt to which no potassium iodide had been added. Care was taken not to include any ewes in the check lot which had been given potassium iodide in other experiments in previous years. Each lot was given the same grain and roughage.

In the check lot, thirty-six per cent of the lambs were affected with goitre, twenty-seven per cent of which died. In the lot getting one ounce of potassium iodide in 100 pounds of salt or one-sixteenth of one per cent, 8·7 per cent were affected but none died. In the lot getting one per cent potassium iodide in the salt, there were no lambs affected with goitre and in addition the lambs were larger and stronger at birth and required less attention than the lambs from the other lots.

SWINE

The Yorkshire breed of swine predominates at this Station. A few Berkshires are raised each season with a view to selecting to improve the type and quality of this breed for bacon purposes.

The swine used in the feeding experiments during the summer of 1925 were marketed in Edmonton in November. In addition to grading alive, the identity of each hog was maintained through the process of slaughtering and the carcasses were graded on the rail, by the same Government graders. Sixty-six per cent of the Berkshires graded select on foot and eighty-eight per cent qualified as selects on the rail. The remainder of the shipment was chiefly Yorkshires with a few Tamworth-Yorkshire crosses. Other than Berkshires, eighty per cent graded select on foot and eighty-five per cent qualified as selects on the rail. All hogs, including the Berkshires, had sufficient length of body to grade select. On account of having to ship some distance to market, the entire lot was marketed at the same time, and, consequently, some were over weight and some too light to qualify as selects, because the hogs were of slightly different ages.



Berkshire boar, Ottawa Model 101—65162—Experimental Station, Scott, Saskatchewan.

The Berkshire sire at this Station is Ottawa Model 101—65162—sired by Willow Lodge Baron 2—57271—. The sire of the Yorkshire hogs marketed this fall was Brandon Stewart —81676— sired by Sunnyside Jude 31—77030—, and the Tamworth sire is Amber Freshman —17346— sired by College Freshman —14254—.

TANKAGE VERSUS BUTTERMILK FED WITH OAT-CHOP

The object of this experiment was to test the comparative value of buttermilk and tankage as protein supplements when fed with oat-chop to growing pigs.

Twelve pigs were divided into three lots of four each. All lots received the same grain ration. In addition, one lot was fed an average of six pounds of buttermilk per day per head for the first seventy-seven days, after which buttermilk was not available. Another lot received ten per cent tankage added to the meal ration for the first 112 days, which was the beginning of the finishing period—five weeks before marketing—when it was discontinued. The grain ration for each lot consisted of oat-chop only until the beginning of the finishing period, after which two parts barley were fed with one part oat-chop. The third lot was used as a check and received a similar grain ration without a protein supplement.

TANKAGE VS. BUTTERMILK FED WITH OAT- AND BARLEY-CHOP

—		Oats only	Oats buttermilk	Oats tankage
Number in each lot	No.	4	4	4
First weight of lot	lb.	207	209	208
First average weight	"	51	52	52
Final weight of lot	"	849	948	798
Final average weight	"	212	237	199
Total gain in 154 days	"	642	739	590
Average gain each	"	160	184	147
Average daily gain each	"	1·03	1·19	0·95
Total quantity of meal eaten	"	2,346	2,346	2,346
Oat-chop at 51 cents per bushel plus $1.50 per ton for crushing	"	1,783	1,783	1,679
Barley-chop at 67 cents per bushel plus $1.50 per ton for crushing	"	563	563	563
Buttermilk at 58 cents per hundred	"	....	1,878	....
Tankage at $50 per ton	"	....	....	104
Total cost of feed	$	36 55	47 44	36 26
Feed cost per 100 pounds gain	$	5 69	6 42	6 14
Meal required per 100 pounds gain	lb.	365·4	317·4	397·6
Gross selling price per head at $11.40 per hundred	$	24 20	27 01	22 74
Selling price per head less cost of feed	$	15 07	15 16	13 68

Deductions.—The meal required per 100 pounds gain was less in the case of the buttermilk lot, although buttermilk was not fed for the full period. The buttermilk in this ration showed a value of 30 cents per hundred, the 1,783 pounds oats, 563 pounds barley and 1,878 pounds buttermilk being equal in feeding value to 2,052 pound oats and 648 pounds barley. The tankage-fed lot required more meal per 100 pounds gain and failed to show any benefit from the feeding of tankage, it actually showing a minus value of $1.25 when compared with the check lot.

TANKAGE VERSUS BUTTERMILK VERSUS PRO-LAC FED WITH OATS AND BARLEY

The object of this experiment was to compare the value of the three protein supplements—tankage, buttermilk and Pro-lac—when fed with oats and barley to growing pigs.

Tankage and buttermilk have been used by most feeders. Pro-lac is a commercial product manufactured at Des Moines, Iowa, and sold as a milk-substitute for swine. It is sold in the form of a meal, one pound of which is stirred in eight gallons of water and allowed to soak from twelve to twenty-four hours before feeding.

Twenty pigs were divided into four lots of five each. One lot was fed tankage, one lot buttermilk, and one lot Pro-lac. The fourth lot was fed the same grain ration with no protein supplement.

TANKAGE VS. BUTTERMILK VS. PRO-LAC FED WITH OATS AND BARLEY

—		Tankage	Buttermilk	Pro-lac	Check
Number in each lot	No.	5	5	5	5
First weight of lot	lb.	225	223	222	252
First average weight	"	45	45	44	50
Final weight of each lot	"	484	568	506	488
Final average weight	"	97	114	101	98
Total gain in 64 days	"	259	345	284	236
Average gain each	"	52	69	57	47
Average daily gain each	"	0·81	1·07	0·89	0·73
Total quantity of meal eaten	"	682	641	659	653
Oat-chop at 51 cents per bushel plus $1.50 per ton for crushing	"	438	481	482	485
Barley-chop at 67 cents per bushel, plus $1.50 per ton for crushing		177	160	159	168
Tankage at $2.50 per hundred	"	67	....	....	....
Buttermilk at 58 cents per hundred	"	....	1,290	....	....
Pro-lac at $9.20 per hundred	"	....	....	18·2	....
Total cost of feed	$	11 17	17 50	11 11	10 08
Feed cost per 100 pounds gain	$	4 31	5 07	3 91	4 27
Meal required per 100 pounds gain	lb.	263	185	232	276
Final valuation per head as shop hogs at 10 cents per pound	$	9 70	11 40	10 10	9 80
Valuation per head less cost of feeds	$	7 47	7 90	7 88	7 79

Deductions.—Pro-lac saved 44 pounds of meal per 100 pounds gain which was 31 pounds more than was saved by feeding tankage. Buttermilk saved 91 pounds of meal per 100 pounds gain as compared with the 44 pounds saved by the use of Pro-lac. The Pro-lac in this test had a value of $12.14 per hundred and the tankage a value of $2.34 per hundred. Buttermilk to the amount of 1,290 pounds produced 109 pounds extra gain as compared with the check lot. In the latter lot it required 276 pounds of grain for each 100 pounds gain, hence 109 pounds gain represents 301 pounds of grain mixture which was worth 1·5 cents per pound or $4.51. This gives the buttermilk a value of 35 cents per hundred. This test only covered a period of sixty-four days. At the end of this period buttermilk was not available The Pro-lac and tankage were continued for a total period of 130 days and the results are shown in the following table:—

TANKAGE VS. PRO-LAC FED WITH OATS AND BARLEY

—		Tankage	Pro-lac	Check
Number in each lot		5	5	5
First weight of lot	lb.	225	222	252
First average weight	"	45	44	50
Final weight of each lot	"	913	979	945
Final average weight	"	183	196	189
Total gain in 130 days	"	688	757	693
Average gain each	"	138	151	139
Average daily gain each	"	1·07	1·16	1·07
Total quantity of meal eaten	"	2,288	2,265	2,405
Oat-chop at 51 cents per bushel plus $1.50 per ton for crushing	"	1,413	1,416	1,518
Barley-chop at 67 cents per bushel plus $1.50 per ton for crushing	"	719	849	887
Tankage at $50 per ton	"	156	....	....
Pro-lac at $9.20 per hundred	"	....	46·2	....
Total cost of feed	$	36 74	39 06	37 52
Feed cost per 100 pounds gain	$	5 34	5 16	5 55
Meal required per 100 pounds gain	lb.	332	299	347
Gross selling price per head at $11.40 per 100 pounds	$	20 82	22 32	21 55
Selling price per head less cost of feeds	$	13 47	14 51	14 04

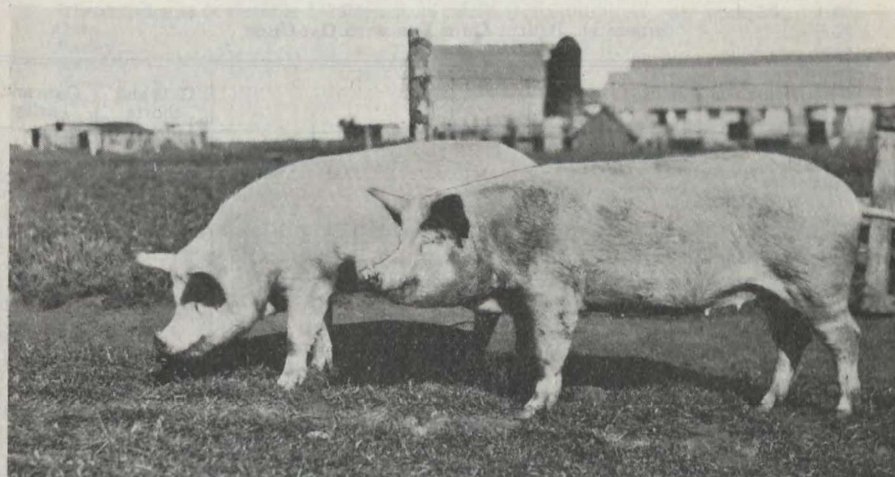
Deductions.—For the period of 130 days the feeding of tankage at the rate of about 7·3 per cent of the meal ration resulted in a saving of 15 pounds of meal per hundred pounds of gain.

Theoretically 1,518 pounds of oat-chop, and 887 pounds of barley-chop proved equal to 1,412 pounds of oat-chop, 723 pounds of barley-chop and 157 pounds of tankage and at the prices named tankage had a value in this ration of $2.47 per hundred pounds.

The feeding of Pro-lac at the rate of approximately 2 per cent resulted in a saving of 48 pounds of meal per 100 pounds of gain. The 1,416 pounds of oat-chop, 849 pounds of barley-chop and the 46·2 pounds of Pro-lac proved equal to 1,658 pounds of oat-chop and 968 pounds of barley-chop which would give Pro-lac a value of $12 per 100 pounds. Due to the long freight shipment of this product, the cost delivered at Scott was $9.20 per hundred.

OAT AND BARLEY-CHOP VERSUS OAT-CHOP ALONE

The object of this experiment was to determine the value of barley when fed in combination with oats to growing pigs. Eight pigs were divided into two lots of four each and one lot was fed one part barley-chop and three parts oat-



Two promising young Yorkshire brood sows at the Scott Station.

chop at the beginning of the experiment. The proportion of barley was gradually increased until at the end of the feeding period the mixture was two parts barley-chop and one part oat-chop. The other lot was fed only oat-chop until five weeks before marketing when barley-chop was added to the ration for finishing.

OAT- AND BARLEY-CHOP VS. OAT-CHOP ALONE

—		Oats only	Oats and barley
Number in each lot		4	4
First weight of lot	lb.	207	211
First average weight	"	51	52
Final weight of lot	"	849	839
Final average weight	"	212	209
Total gain in 154 days	"	642	628
Average gain each	"	160	157
Average daily gain each	"	1·04	1·02
Total quantity of meal eaten	"	2,346	2,346
Oat-chop at 51 cents per bushel plus $1.50 per ton for crushing	"	1,783	1,423
Barley-chop at 67 cents per bushel plus $1.50 per ton for crushing	"	563	923
Total cost of feed	$	36 55	38 55
Feed cost per 100 pounds gain	$	5 69	6 13
Meal required per 100 pounds gain	lb.	365·4	373·5
Gross selling price per head at $11.40 per hundred	$	24 20	23 91
Selling price per head less cost of feeds	$	15 07	14 28

Deductions.—The total gains and the meal required for each 100 pounds gain are both in favour of the lot which received no barley until the beginning of the finishing period. This single test indicates that barley is not required during the early stage of growth.

SHORTS VERSUS BARLEY-CHOP FED WITH OAT-CHOP

The object of this experiment was to compare the value of shorts and barley-chop when fed with oat-chop to growing pigs.

Two lots of five pigs each were used. The proportions of each feed at the beginning of the experiment were three parts oat-chop and one part shorts or barley-chop. The proportion of oat-chop was gradually replaced by the other feed, until at the finishing period the mixture used was half oat-chop and half shorts or barley.

SHORTS VS. BARLEY-CHOP FED WITH OAT-CHOP

—		Oats and shorts	Oats and barley
Number in each lot		5	5
First weight of lot	lb.	219	252
First average weight	"	43·8	50·4
Final weight of lot	"	868	945
Final average weight	"	173	189
Total gain in 130 days	"	649	693
Average gain each	"	129·8	138·6
Average daily gain each	"	0·99	1·07
Total quantity of meal eaten	"	2,405	2,405
Oat-chop at 51 cents per bushel plus $1.50 per ton for crushing	"	1,518	1,518
Barley-chop at 67 cents per bushel plus $1.50 per ton for crushing	"	....	887
Shorts at $29 per ton	"	887	....
Total cost of feed	$	36 93	37 52
Feed cost per 100 pounds gain	$	5 69	5 41
Meal required per 100 pounds gain	lb.	371	347
Gross selling price per head at $11.40 per hundred	$	19 79	21 55
Selling price per head less cost of feeds	$	12 41	14 04

Deductions.—It required 24 pounds more of the oat and shorts mixture per 100 pounds gain than was required of the oat and barley mixture. With the prices of the respective feeds as shown in the table the barley-chop has been more economical in this test than the shorts. On the other hand, if barley were scarce or expensive and shorts available and reasonable in price, shorts would be a satisfactory substitute for barley-chop.

FIELD HUSBANDRY

CROP ROTATIONS

Approximately 200 acres are devoted to investigational work in crop rotations. In all, eight rotations are in operation, and those include straight grain crops, grain with hay and pasture crops, grain with hay and sunflowers, grain with hay and summer-fallow substitutes. The object of this work is to determine, if possible, what sequence of crops is most profitable. With this object in view, records are kept each year of all items of expense and returns, based on current prices paid during each year.

Cost Values for the Season 1925

Rent	per acre.. $	3 20
Manure	" ton	1 00
Seed wheat	" bushel	2 00
" oats	" "	1 00
" barley	" "	1 50
" rye	" "	1 25
Sunflower seed	" pound	0 10
Sweet clover seed	" "	0 13
Western rye grass seed	" "	0 10
Twine	" "	0 16½
Machinery	" acre	1 50
Manual labour	" hour	0 30
Horse labour per horse	" "	0 08
Threshing—		
Wheat	" bushel	0 14
Barley	" "	0 12
Oats	" "	0 10
Rye	" "	0 14

Return Values for the Season 1925

Wheat (price as on October 1, 1925)	per bushel $	1 00
Oats	" "	0 34
Barley	" "	0 48
Rye	" "	0 56
Western rye hay	" ton	8 00
Sweet clover hay	" "	8 00
Sunflower ensilage	" "	3 50
Oat straw	" "	2 00
Barley straw	" "	2 00
Pasture, one cow or horse	" month	1 80
Pasture, one sheep	" "	0 45

The cost of production is figured on the basis of an acre for each of the crops. The charges against the summer-fallow include rent, machinery and labour, and the cost of summer-fallowing is divided on the basis of two-thirds of the cost charged to the first crop, and one-third charged to the second crop after the summer-fallow. The cost of the grass and clover seed is distributed equally among each hay and pasture crop in the rotation.

Culture of Summer-fallow.—The summer-fallow fields of all rotations were ploughed to a depth of about 6 inches in June, packed and harrowed after ploughing, and kept clear of weeds throughout the summer by cultivating with a duck-foot cultivator. From two to three cultivations were found necessary to keep the weeds in check.

Field "A" Wheat Continuously

One acre field has been seeded to wheat each year since 1912. The field is 98 feet wide by 144.5 feet and is located lengthwise of the tree-strip, and as a result of its location considerable snow is caught and retained during the winter months. This has vitiated the results to such a varying extent that the yields are not comparable with the rotations. In order to check the effect of the snow on this plot, the field was divided lengthwise at time of harvest and threshed separately. The half nearest the tree-strip yielded 2 bushels more per acre. While this difference is no criterion of how much the whole plot is affected by snow each year, nevertheless, it does show that winter snow-fall has a direct bearing on crop yields. This field was ploughed in May, packed, harrowed, and seeded to Marquis wheat. It yielded at the rate of 21 bushels to the acre. The value of the crop was $21, and the cost of production $15.44. The cost per bushel of grain was 74 cents and the profit per acre $5.56. The average profit for the past five years was 79 cents per acre. The cost per bushel of grain for the same period was $1.43 and the average cost of one bushel for the fourteen-year period this system has been in operation was $1.21. Notwithstanding the fact that this field has been ploughed each year, either in the fall or spring, it has been practically impossible to control weeds, indicating that wheat continuously is not a practice to be recommended.

ROTATION "B" (TWO YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.

The alternating of wheat and summer-fallow is not a practice that is followed by many farmers in northwestern Saskatchewan. This rotation was commenced in 1922 to compare it with Rotation "C"—summer-fallow, wheat, wheat.

Previous to seeding wheat on May 1 the land was harrowed to break down lumps and insure a good seed-bed.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)

Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss per acre	
	1925	Average five years			1925	Average five years
	bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
Summerfallow	....	....	....	7 65	−7 65	−8 33
Wheat—Garnet	34·3	23·7	34 30	14 91	19 39	10 61
Average per acre	....	....	17 15	11 28	5 87	1 14

This arrangement of crops returned a profit of $5.87 per acre, and for the five years this rotation has been operating it has shown an average profit of $1.14 per acre. The wheat crop cost 66 cents per bushel, while the average cost for five years was $1.05 per bushel.

ROTATION "C" (THREE YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—Wheat.

This rotation was started in 1912 and is followed by the majority of farmers in this district. It has one advantage over alternate wheat and summer-fallow, in that only one-third instead of one-half of the farm is lying idle each year.

Both fields of wheat were seeded on May 1 at the rate of 1½ bushels per acre. Previous to seeding on summer-fallow, the land was harrowed. The first crop stubble was spring-ploughed, packed and harrowed previous to drilling. The wheat on spring ploughing was ready to cut on August 26, while the wheat on summer-fallow was not ripe until September 3.

SUMMARY OF YIELDS, VALUE, AND PROFIT AND LOSS (PER ACRE)

Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss per acre	
	1925	Average 14 years			1925	Average 14 years
	bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
Summer-fallow	....	....	....	7 86	−7 86	−6 75
Wheat—Marquis	20·7	19·6	20 70	12 78	7 92	10 58
Wheat—Marquis	29·3	17·1	29 30	15 67	13 63	6 36
Average by acre	....	....	16 66	12 10	4 56	3 39

This rotation yielded four-tenths of a bushel more grain per acre on an average of five years than Rotation "B". On the other hand, the profit per acre for the same period for Rotation "B" was $1.14 as against $0.53 for this rotation.

It will be observed that the yield of wheat following wheat this season was 8.6 bushels more than the yield on summer-fallow.

The cost per bushel of wheat was 87 cents for the first crop on summer-fallow and 62 cents for the second crop following summer-fallow. The higher cost of the wheat on summer-fallow is due to two factors; first the lower yield and second to charging two-thirds of the cost of summer-fallowing against the crop.

Taking the average for the past fourteen years this rotation has returned a profit per acre of $3.39. The cost of producing wheat for the same period has been 89 cents per bushel.

ROTATION "S" (THREE YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—One half sweet clover and one half oats.

This rotation was started in 1922 with the object of determining the advisability of including sweet clover in a crop rotation.

Rotation "S" involves a comparison of sweet clover with oats in the third year, and the following division is made to make this comparison more easily followed—summer-fallow, wheat and sweet clover, versus, summer-fallow, wheat and oats. It will be observed that the latter division differs from Rotation C by having oats in place of wheat in the third year.

When seeding to wheat, one-half of the field is seeded at the rate of 1½ bushels per acre, while the other half is seeded down to sweet clover at the rate of fifteen pounds of sweet clover to one bushel of wheat per acre. The sweet clover is mixed with the wheat at the time of drilling.

The wheat stubble is spring-ploughed and harrowed previous to drilling.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)

Crop	Yield per acre 1925	Yield per acre Average four years	Value of crop 1925	Cost of production 1925	Profit or loss per acre 1925	Profit or loss per acre Average four years
	bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
Summer-fallow	....	....	....	7 65	−7 65	−8 56
Wheat	20·6	20·6	20 60	11 73	8 87	8 42
	tons	tons				
Sweet clover	0·64	1·33	5 12	8 75	−3 63	1 89
Average per acre	....	....	8 57	9 37	−0 80	0 58
Summer-fallow	....	....	....	7 65	−7 65	−8 56
	bush.	bush.				
Wheat	21·4	23·1	21 40	12 85	8 55	9 65
Oats	85·8	50·6	31 91	19 35	12 56	5 45
Average per acre	....	....	17 77	13 28	4 49	2 18

It will be noted that the yield of sweet clover was light—0.65 tons as against an average yield for the three previous years of 1.56 tons. There was about a 45 per cent stand of sweet clover this season. This was probably the result of a poor catch on account of the drought of the previous season

The roots of a strong-growing sweet clover plant, besides adding fibre to the soil, have the property, by virtue of the legume bacteria that live on them, of taking nitrogen from the air and of enriching the soil with this essential element on decay. This rotation has not been established for a sufficient length of time for the wheat to get the benefit of the legume.

It will be noted that there was a loss of 2.5 bushels per acre when using wheat as a nurse-crop for the four-year period. The returns from this rotation for the past season, show, when sweet clover follows wheat a loss of 80 cents per acre, and where oats follow wheat, a profit of $4.49 per acre. This high profit is due to the good yield of oats. The average returns for the past four years give a profit of 58 cents per acre where sweet clover follows wheat and a profit of $2.18 where oats follow wheat.

ROTATION "F" (THREE YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—Fall rye.

This rotation has been in operation since 1922. It was revised in 1924 and consequently only a two-year average is given in the accompanying table.

The object is to determine the possibility of introducing fall rye into the regular rotation to replace oats. The fall rye was seeded in the wheat stubble at the time of cutting on September 3, 1924. The preparation given the seed-bed consisted of preceding the drill with the disk immediately after the binder.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)

Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss per acre	
	1925	Average two years			1925	Average two years
	bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
Summer-fallow				8 38	−8 38	−10 10
Wheat—Garnet	36·5	25·8	36 50	14 97	21 53	15 57
Fall rye—Dakold	29·0	15·8	16 24	13 38	2 86	−0 95
Average per acre			17 58	12 24	5 34	1 51

The fall rye came through the winter in good condition and yielded 29 bushels per acre. The yield of fall rye in the dry season of 1924 was 2.6 bushels per acre. This low yield accounts for the crop being produced at a loss on a two-year average.

The returns for this rotation for 1925 show a profit of $5.34 per acre, while the two-year average profit is $1.51 per acre.

In the variety tests reported in the section of this report dealing with cereals, it will be noted that the yields of fall rye were disappointing due to winter-killing. It is apparent, therefore, that when fall rye is drilled in the stubble, as is the case in this rotation, the stubble by holding the snow, tends to give winter protection to the fall rye which would otherwise not be obtained had the fall rye been seeded on summer-fallow, as is the procedure in the variety test plots.

ROTATION "D" (FOUR YEARS' DURATION)

First year—One half oats in rows, and one half oats.
Second year—Wheat.
Third year—Oats.
Fourth year—Sweet clover pasture.

The land was broken from prairie in 1923 and the rotation started in 1924. This rotation consists of four nine-acre fields, making a total of thirty-six acres. The object in view is to study the effect of intertilled oats in the summer-fallow year on succeeding crops and obtain data regarding the carrying capacity of sweet clover. Beginning in 1926, the first year of this rotation will be changed to one half summer-fallow, and one half intertilled wheat. By making this change, intertilled wheat in the summer-fallow year will be compared with a straight summer-fallow.

The intertilled oats were seeded on spring ploughing in triple rows, with 36 inches between the outside rows for cultivation. Four cultivations were given during the growing season with a two horse corn cultivator.

The wheat of the second year was seeded on fall-ploughed oat stubble at the rate of 1½ bushels per acre. The oats in the third year were seeded on fall-ploughed wheat stubble at the rate of 1 bushel of oats and 15 pounds of sweet clover per acre. The sweet clover and oats were mixed together at the time of drilling.

As this rotation involves a comparison of intertilled oats, with oats in the first year, the following division is made to make this comparison more easily followed.

Summary of Yields, Value and Profit and Loss (Per Acre)

—	Yield per acre 1925	Value of crop 1925	Cost of production 1925	Profit or loss per acre 1925
	bush.	$	$	$
Oats in rows	38·9	14 43	15 56	−1 13
Wheat—Marquis	28·9	28 90	16 26	12 64
Oats—Banner	79·6	29 26	18 38	10 88
Sweet clover for pasture	....	8 63	7 16	1 47
Average per acre	....	20 31	14 34	5 97
Oats in solid block	58·0	21 72	16 96	4 76
Wheat—Marquis	28·7	28 70	16 23	12 47
Oats—Banner	79·6	29 26	18 38	10 88
Sweet clover for pasture	....	8 63	7 16	1 47
Average per acre	....	22 08	14 68	7 40

It will be observed from one year's results that oats in rows yielded 19.1 bushels per acre less than oats in solid block, and that the wheat crop following oats in rows was merely two-tenths of a bushel more than when following oats in solid block.

The sweet clover was pastured at intervals from June 13 to October 29. It had a carrying capacity of four sheep per month at a cost of 37½ cents for one sheep per month.

ROTATION "J" (SIX YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—Wheat.
Fourth year—Oats seeded down.
Fifth year—Hay.
Sixth year—Hay or pasture.

This rotation was started in 1912 on small fields and after five years' trial it gave more promise of success than any of the others in operation. It was then transferred to six twenty-acre fields, using in all 120 acres of land. It will be noticed that one-half the area is in grain each year, one-third in hay and pasture, and one-sixth in summer-fallow.

During the years 1918 to 1924 inclusive, oats were grown as a second crop after summer fallow. This year wheat was grown in place of oats. The reason for the change being, that in ordinary farm practice a greater acreage would be in wheat on account of wheat being the major cash-crop.

Sod-land to be summer-fallowed was ploughed the middle of June, packed and harrowed, and given two cultivations later in the season. Both the stubble of the first and second crop was spring-ploughed. A good seed-bed was secured by harrowing and packing after ploughing. This year the field which was seeded down received an extra harrowing before drilling. The system followed in seeding down is to mix the western rye grass and sweet clover with the oats, and sow the mixture with the grain drill—at the rate of 2 bushels of oats, 12 pounds of western rye grass and 6 pounds of sweet clover per acre. By this method no difficulty has been experienced in obtaining a catch of grass during the fourteen years this rotation has been in operation. The first year's crop is usually taken off for hay and the second year's crop is pastured. Additional pasture is secured in the spring from the grass field that is to be summer-fallowed. The aftermath from the hay crop together with the stubble-fields supply considerable fall pasture.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)

Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss per acre	
	1925	Average fourteen years			1925	Average fourteen years
	bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
Summer-fallow	....	....	2 40	7 82	−5 42	−6 57
Wheat—Garnet	30·8	25·5 (8 years)	30 80	13 85	16 95	15 86
Wheat—Marquis	32·5	20·3 (6 years)	32 50	15 18	17 32	9 85
Oats (1919-24)	....	38 3	....	....	....	2 66
Oats—Banner	76·5	47·2 (10 years)	28 61	17 98	10 63	7 03
	tons					
Hay	1·40	0·93	12 85	10 28	2 57	2 06
Hay or Pasture	0·47	....	6 35	7 56	−1 21	1 51
Average per acre	....	....	18 92	12 10	6 81	4 44

The yields from rotation "J" for the crop year 1925 are very much higher than the average for the fourteen-year period. In the past five years this rotation has shown a profit of $2.97 per acre and for the fourteen-year period a profit of $4.44 per acre, which is greatly in excess of rotation "C" (summer-fallow, wheat, wheat).

The 1925 figures for the cost per bushel of wheat on summer-fallow was 62 cents, wheat following wheat 55 cents, and oats following two crops of wheat 24 cents. The cost of hay was $6.46 per ton.

ROTATION "P" (EIGHT YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—Wheat.
Fourth year—Summer-fallow (manure 15 tons per acre).
Fifth year—Sunflowers.

Sixth year—Barley seeded down.
Seventh year—Hay.
Eighth year—Hay.

This rotation was started in 1912. In 1920 sunflowers replaced peas in the fifth year. Once in eight years manure is applied to each field at the rate of 15 tons per acre, and ploughed down at the time of ploughing for summer-fallow. The field in sunflowers the previous season was harrowed before being seeded to barley. The first crop of wheat stubble was spring-ploughed, harrowed and packed. In the spring previous to seeding on summer-fallow the fields were harrowed. Sod-land to be summer-fallowed was ploughed the middle of June, packed and disked, and given three cultivations at intervals later in the season to destroy weeds. When seeding down, a mixture of 10 pounds of western rye grass and 6 pounds of sweet clover is used per acre. This is mixed with 2 bushels of barley per acre at time of drilling. Sunflowers were seeded at the rate of 12 pounds per acre. Rabbits destroyed about 40 per cent of the sunflower crop, making it necessary to re-seed portions of the field.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS (PER ACRE)

Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss per acre	
	1925	Average fourteen years			1925	Average fourteen years
	bush.	bush.	$	$ cts.	$ cts.	$ cts.
Summer-fallow	....	....	....	8 97	−8 97	−7 76
Wheat—Marquis	27·3	22·6	27 30	15 89	11 41	12 19
Wheat—Marquis	27·3	16·7	27 30	17 74	9 56	5 20
Summer-fallow	....	....	....	12 18	−12 18	−7 84
Sunflowers—Mam. Russian	tons 10·04	(6 years) 8·63	35 14	24 05	11 09	8 17 8 20
Peas (1912–19)—		(8 years) 22·1	....	....	....	8 14
Barley—Duckbill (1922 Ensiled)	bush. 65·3	(13 years) 2·66	34 24	20 16	14 08	2 81
Hay	tons 1·83	(5 years) 1·37 tons	14 64	10 15	4 49	2 88
Hay	1·30	0·96 tons	10 40	10 78	−0 38	1 27
	....	....	18 63	14 99	3 64	2 12

It will also be noted that the cost of summer-fallowing is higher for one field than the other. This is accounted for by the fact that couch grass was present, making it necessary to plough a second time.

The average returns for the past five years show a loss of 43 cents per acre, while, for the fourteen-year period a profit of $2.12 per acre is realized. Comparing this with rotation " J " from a financial standpoint, the latter is preferred.

SUMMARY OF ROTATION EXPERIMENTS

In order that the results from the rotations started in 1911 may be easily compared, the following table is included showing the average cost, the returns and profits per acre for the past five years, and the profits per acre for the last fourteen years. Prior to 1920, a fixed set of values were used in calculating the rotation returns. In comparing the results of 1920 and since, values are based on current prices paid during the year.

COSTS, RETURNS AND PROFITS FROM ROTATIONS. (1921-1925).

Rotation	Average cost to operate per acre for five years	Average returns per acre for five years	Average profit per acre for five years	Average profit per acre for fourteen years
	$ cts.	$ cts.	$ cts.	$ cts.
"C" (three years' duration)	11 21	11 74	0 53	3 39
"J" (six years' duration)	10 61	13 58	2 97	4 44
"P" (eight years' duration)	13 71	13 28	−0 43 (loss)	2 12

It will be observed that rotation "J" has returned a fair profit per acre for the five-year period as well as the fourteen-year period. When compared with rotation "C" the average profit is $2.44 more for the last five years of operation and $1.05 more for the fourteen years. Incidentally, rotation "J" is being followed by a number of farmers in northwestern Saskatchewan with good success. One reason rotation "P" does not show up better is because barley is included in this rotation and it is not as dependable a dry-land crop as wheat or oats. Another reason is that the cost to operate is high due to two summer-fallows entering into the crop sequence.

The findings of the Dominion Chemist as given in detail in Bulletin No. 44, New Series, dealing with the "Influence of grain growing on the nitrogen and organic matter content of the Western Prairie soils of Canada" refers to the analysis of soil samples taken from certain rotation fields at this Station in 1916 and again in 1922. The results furnish evidence that a loss of nitrogen and organic matter ensues from exclusive grain-growing, but that the amount of these constituents has been maintained or increased by a rotation in which one or more hay crops (grasses and legumes), with or without manure, are included.

CULTURAL EXPERIMENTS

The investigational work reported under this heading includes experiments in various methods of summer-fallowing, the use of different summer-fallow substitutes, stubble-treatment, methods of seeding down and breaking western rye grass, applying barnyard manure, ploughing down green crops and experiments in soil-packing.

The 1925 yields together with the average yields for a number of years are presented in the following tables with deductions drawn from the experiments.

THE TREATMENT OF SUMMER-FALLOW

The object of this experiment is to determine the most satisfactory method of summer-fallowing. In addition to the treatments listed in the following table, all plots are given similar additional cultivation to check the growth of weeds.

In the depth of ploughing experiment, the yields indicate that there is little to be gained by ploughing deeper than 4 inches. Backsetting in September 6 inches deep after a 4-inch ploughing in June has given an increase of three bushels per acre on a ten-year average as compared with one ploughing at a depth of 4 inches. Ploughing twice at the same depth has been unprofitable. Cultivating the summer-fallow land without ploughing has recently been started and the first crop following the treatment was harvested in 1925. The yield was 1.6

Plot	Crop	Summer-fallow treatment	Yield in bushels per acre	
			Yield 1925	Average yield ten years
1	Wheat	Ploughed 4 inches in June	37·6	26·8
2	"	" 6 inches in June (Average of two plots)	32·9	26·8
3	"	" 8 inches in June	34·6	26·1
4	"	" 4 inches in June and 4 inches in Sept	35·0	26·1
5	"	" 6 inches in June and 6 inches in Sept	35·4	25·8
6	"	Ploughed 8 inches in June and 8 inches in Sept	34·6	25·1
7	"	" 6 inches in June and 4 inches in Sept	34·6	27·1
8	"	" 4 inches in June and 6 inches in Sept	36·4	29·8
9	"	Cultivated early June and as necessary to control weeds. (Not ploughed)	36·0	....
10	"	Ploughed 5 inches in June—seeded ½ bushel oats per acre. Pastured	31·4	24·4
14	"	Fall cultivated before summer-fallowing. Ploughed 6 inches in June	33·4	26·0
15	"	Fall ploughed 4 inches before summer-fallowing. Ploughed 6 inches in June	34·6	26·6
16	"	Cultivated in spring before summer-fallowing	39·3	28·3

bushels per acre less than the plot ploughed 4 inches deep. The seeding of one-half bushel of oats just after ploughing in June to be pastured off has reduced the yield by 2.4 bushels as compared with 4-inch ploughing, on a ten-year average—the difference was greater in 1925. Ploughing or cultivating of the stubble in the fall before summer-fallowing has shown a decrease in yield as compared with 6-inch ploughing in June; on the other hand, spring-cultivating previous to summer-fallowing has given an increase of 1.5 bushels on a ten-year average as compared with the 4-inch ploughing with no spring cultivation previous to summer-fallowing.

SUMMER-FALLOW TREATMENT AFFECTING SECOND CROP

After the wheat crop on summer-fallow is threshed, rotted manure is applied with a manure-spreader at the rate of eight tons per acre in the fall. The stubble is spring-ploughed and seeded to oats. Care is taken that the manure is applied at the same rate and that each plot is ploughed the same depth and given the same treatment.

Plot	Second crop after fallow	Summer-fallow treatment	Yield in bushels per acre	
			Yield 1925	Average yield nine years
1	Oats	Ploughed 4 inches in June	95·2	68·9
2	"	Ploughed 6 inches in June. (Average two plots)	92·0	64·1
3	"	Ploughed 8 inches in June	94·1	67·6
4	"	Ploughed 4 inches in June and 4 inches in Sept	95·2	66·3
5	"	Ploughed 6 inches in June and 6 inches in Sept	94·7	64·0
6	"	Ploughed 8 inches in June and 8 inches in Sept	102·0	62·9
7	"	Ploughed 6 inches in June and 4 inches in Sept	99·6	63·4
8	"	Ploughed 4 inches in June and 6 inches in Sept	95·2	62·1
10	"	Ploughed 5 inches in June—seeded ½ bushel oats per acre. Pastured	94·9	62·7
14	"	Fall cultivated before summer-fallowing. Ploughed 6 inches in June	92·6	60·1
15	"	Fall ploughed 4 inches before summer-fallowing. Ploughed 6 inches in June	103·5	61·1
16	"	Cultivated in spring before summer-fallowing	108·4	60·6

The highest nine-year average yield of the second crop after fallow was from the plot which was ploughed 4 inches deep in the summer-fallow year, while the highest yield in 1925 was from the plot cultivated previously in the spring before summer-fallowing. Some high yields are shown for 1925, but the average figures are a better index of the merits of the various cultural treatments.

DATES OF PLOUGHING SUMMER-FALLOW

Plot	Crop	Plot treatment	Yield in bushels per acre	
			Yield 1925	Average yield ten years
11	Wheat	Ploughed May 15	38·0	30·5
12	"	" June 15	36·0	27·9
13	"	" July 15	33·8	25·6
11	Oats	(Second crop) Fallow ploughed May 15	92·9	63·2
12	"	(Second crop) Fallow ploughed June 15	92·9	58·9
13	"	(Second crop) Fallow ploughed July 15	96·4	59·8

Approximately five bushels of wheat per acre is the average gain over a period of ten years, when the summer-fallow is ploughed in May rather than in July. The average yield of oats as second crop following wheat also indicates the value of ploughing summer-fallow early. It may not be possible on the average farm to plough for summer-fallow before June, but even the June ploughing shows an increase in yield of 2.3 bushels over the July ploughing.

DEPTH OF PLOUGHING SUMMER-FALLOW

A more extensive test dealing with depths of ploughing and subsoiling is indicated in the table following:—

DEPTH OF PLOUGHING SUMMER-FALLOW

Plot No.	First crop after fallow	Treatment given	Yield in Bushels per Acre	
			Yield 1925	Average yield 11 years
1	Wheat	Fallow ploughed 3 inches deep	29·9	23·3
2	"	" 4 "	31·4	24·7
3	"	" 5 "	31·4	24·1
4	"	" 6 "	30·8	23·5
5	"	" 7 "	31·6	24·2
6	"	" 8 "	31·8	23·3
7	"	" 5 " and subsoiled 4 inches	30·0	24·3
8	"	" 6 " " "	35·8	24·6
9	"	" 7 " " "	33·0	23·5
10	"	" 8 " " "	30·4	23·5

In this experiment ploughing to a depth of 4 inches has given good results. The eleven-year-average yields do not warrant the extra labour of subsoiling.

DEPTH OF PLOUGHING SUMMER-FALLOW

Plot No.	Second crop after fallow	Treatment given	Yield in Bushels per Acre	
			Yield 1925	Average yield nine years
1	Oats........	Fallow ploughed 3 inches deep..............................	94·7	59·8
2	"	" 4 "	96·4	63·0
3	"	" 5 "	94·7	61·2
4	"	" 6 "	95·2	59·4
5	"	" 7 "	94·7	59·0
6	"	" 8 "	82·3	57·9
7	"	" 5 " and subsoiled 4 inches........	95·2	61·7
8	"	" 6 " " 4 "	86·4	60·2
9	"	" 7 " " 4 "	87·0	61·0
10	"	" 8 " " 4 "	96·4	51·3

The second crop after fallow shows the four-inch ploughing of summer-fallow to be the most economical, and that subsoiling is unprofitable.

SUMMER-FALLOW SUBSTITUTES

The object of this experiment is to determine the possibility of using inter-tilled crops as substitutes for summer-fallow. The following table is included to give an idea of what yields may be expected from wheat, oats, and barley when grown in rows as a substitute for summer-fallow.

In this experiment a two-year rotation is followed, namely, alternate summer-fallow substitutes and wheat. The land is spring-ploughed for the summer-fallow substitutes and cultivated during the summer between the groups of rows as necessary to control weeds. The land is double-disked or cultivated the following spring before seeding wheat.

SUMMER-FALLOW SUBSTITUTES (FIRST YEAR)

Crop	Treatment given	Yield in Bushels per Acre	
		Yield 1925	Average yield three years
Oats (double rows)..........................	Stubble spring-ploughed.........	64·6	51·8
" (triple rows)..........................	" "	81·8	61·1
Barley (double rows)..........................	" "	32·0	25·0
" (triple rows)..........................	" "	35·0	29·5
Wheat (double rows)..........................	" "	25·6	19·3
" (triple rows)..........................	" "	26·3	22·4

SUMMER-FALLOW SUBSTITUTES (SECOND YEAR)

Crop	Treatment given	Yield in Bushels per Acre	
		Yield 1925	Average Yield three years
Wheat......	Following oats in double rows....................................	35·3	30·3
"	" oats in triple rows....................................	31·9	29·1
"	" barley in double rows....................................	31·8	27·6
"	" barley in triple rows....................................	39·9	28·6
"	" wheat in double rows....................................	37·0	27·3
"	" wheat in triple rows....................................	34·1	25·7
"	" corn....................................	38·8	31·3
"	" potatoes....................................	40·3	28·7
.....	" bare summer-fallow....................................	38·6	27·4

The highest yield for an average of three years is following corn and the next highest is following oats in double rows, while the average yield following the bare summer-fallow is low.

So far corn is not a dependable crop in the Scott district and for this reason is not likely to be used for a summer-fallow substitute to any extent. One serious objection to using grain in rows as a summer-fallow substitute is the fact that volunteer grain is usually found in the succeeding crops as a result of seed shelling from the substitute crop at harvest. This is particularly objectionable when registered seed is being grown. However, when it is feasible to grow the same variety or strain of grain as a summer-fallow substitute this objection is overcome to some extent.

Where perennial weeds or grasses are present it is difficult to prevent them growing in the row-groups, but when the land is comparatively clean the use of summer-fallow substitutes may prove profitable.

STUBBLE TREATMENT

The object of this experiment is to determine the best method of treating the stubble in preparation for wheat or oats. The land used for this experiment is free from perennial weeds and grass and the stubble-land is usually in a mellow condition. The yields shown in the following table where seeding without ploughing is done could not be expected from land where many weeds are present.

STUBBLE TREATMENT FOR WHEAT

Plot	Crop	Stubble Treatment	Yield in Bushels per Acre	
			Yield 1925	Average yield ten years
1	Wheat....	Fall ploughed 4 inches deep	30·1	18·1
2	"	Disked in fall—seeded	18·0	19·3
3	"	Disked after burning of stubble in fall	32·0	21·8
4	"	Ploughed 4 inches deep after burning of stubble in fall	31·9	20·7
5	"	Seeded after burning stubble in spring	25·1	23·6
6	"	Ploughed 4 inches in spring	30·0	22·4
7	"	Disked at cutting time—ploughed 4 inches in spring	30·0	21·0
8	"	Disked at cutting time—ploughed 4 inches in fall	27·0	19·4
9	"	Ploughed 4 inches in fall	26·9	19·6
10	"	Ploughed 4 inches in spring	29·8	22·3
14	"	Cultivated shallow in fall	26·4	
15	"	Cultivated deeply in fall	30·3	
16	"	Seeded without cultivation	14·6	

The highest average yield of wheat has been obtained from seeding after burning the stubble in spring, and the second highest yield after spring ploughing. The ten-year average figures show a difference of 2·7 bushels per acre in favour of spring ploughing as compared with fall ploughing. The disking of the stubble at cutting time has not been profitable either when ploughed in the fall or spring. In fact the general results show that any operation which destroys the stubble in the fall, so that the snow is not held has resulted in a reduction of yield.

The 1925 figures show deep fall cultivation as giving a higher yield than shallow fall cultivation. Stubbling in without any cultivation has given the lowest yield of all the treatments under test.

STUBBLE TREATMENT FOR OATS

Plot	Crop	Stubble Treatment	Yield in Bushels per Acre	
			Yield 1925	Average yield eleven years
11	Oats......	Ploughed 4 inches in fall..................................	78·8	48·2
12	"	Ploughed 4 inches in spring..............................	98·2	57·0
13	"	Cultivated in spring before seeding......................	67·6	51·1

In comparing fall and spring ploughing for oats, the eleven-year average yield shows a difference of 8·8 bushels in favour of the spring ploughing. Cultivating the stubble in the spring and seeding without ploughing has given a higher average yield than fall ploughing, although the 1925 yields are the reverse.

SEEDING TO WESTERN RYE AND SWEET CLOVER

An experiment has been conducted for eleven years comparing different methods of seeding down, including seeding with a nurse-crop and alone on summer-fallow, following a hoed crop and following the first and second crops of grain, after fallow. Good catches of grass have been obtained by each method. A larger yield of hay has been obtained the first season by seeding without a nurse-crop, but the difference in yield has not been sufficient to warrant allowing the land to remain unproductive during the season the grass is seeded.

The method usually recommended for seeding down is to seed with a nurse-crop mixing the grass seed in the drill-box with the grain. When the nurse-crop is seeded at less than the regular rate of seeding higher yields of hay are usually obtained.

BREAKING WESTERN RYE SOD

The object of this experiment is to determine the most satisfactory method of breaking western rye grass sod and to study the effects of growing wheat, oats and flax on spring breaking. Each plot is given the necessary cultivation immediately after breaking, to ensure a good seed-bed. The following table gives the dates and methods of breaking:—

BREAKING WESTERN RYE GRASS SOD

Plot	First crop after breaking	Plot Treatment	Yield in Bushels per Acre	
			Yield 1925	Average yield eight years
1	Wheat......	Ploughed 5 inches late July............................	23·4	15·0
2	"	" 5 inches October............................	20·4	12·8
3	"	" 4 inches early July, backset in September...	25·4	14·7
4	"	" 4 inches late July, backset in September.....	23·3	14·4
5	"	" 5 inches in spring just before seeding.........	20·8	13·1
6	Flax	" 5 inches in spring just before seeding.........	10·7	5·9
7	Oats........	" 5 inches in spring just before seeding......... (six year average)	59·0	27·2
8	Wheat......	" 6 inches early June—worked as fallow........	26·3	17·1

The lowest average yield of wheat was from the plot broken in October and the highest yield was from the plot broken early in June and worked as a summer-fallow.

The second crop after breaking is wheat, which affords a comparison of all treatments under test.

BREAKING WESTERN RYE SOD—SECOND CROP AFTER BREAKING

Plot	Second crop after breaking	Plot Treatment when Breaking	Yield in Bushels per Acre	
			Yield 1925	Average yield three years
1	Wheat......	Ploughed 5 inches late July..........	24·4	19·7
2	"	" 5 inches October..........	23·8	19·7
3	"	" 4 inches early July, backset in September....	26·6	21·6
4	"	" 4 inches late " "	23·6	20·0
5	"	" 5 inches in spring just before seeding..........	17·6	17·8
6	"	" 5 inches " " flax.....	22·1	19·7
7	"	" 5 inches " " oats....	25·0	20·4
8	"	" 6 inches early June—worked as fallow........	26·0	22·4

Flax grown on spring breaking is followed by a yield of wheat equal to that obtained from July breaking.

The highest yield of second crop is from the plot which was broken early in June and summer-fallowed. Breaking four inches in early July and backsetting in September has given the next highest yield of second crop on the average.

Seeding wheat immediately after spring breaking has resulted in the lowest second crop yield. To arrive at the difference in total returns following each method of breaking the average yields from the six wheat plots shown in the two preceding tables are given below.

BREAKING WESTERN RYE SOD—TOTAL OF TWO CROPS AFTER BREAKING

Plot	Crops	Plot Treatment when Breaking	Total average yields
1	Wheat......	Ploughed 5 inches late July..........	34·7
2	"	" 5 inches October..........	32·5
3	"	" 4 inches early July, backset in September..........	36·3
4	"	" 4 inches late July, backset in September..........	34·4
5	"	" in spring just before seeding..........	30·9
8	"	" early June and cultivated as fallow..........	39·6

A loss of 2.2 bushels per acre is shown as a result of breaking in October, as compared with breaking in late July. When backset in September, approximately 2 bushels have been gained by breaking early in July rather than late July. The lowest yield has resulted from breaking just before seeding and the highest by breaking early in June and cultivating as a summer-fallow, there being a difference of 8.7 bushels per acre in the two crops.

APPLYING BARNYARD MANURE

The object of this experiment is to determine the value of barnyard manure for wheat, oats and barley and to determine the proper time and method of applying. Both fresh and rotted manure are applied with a manure spreader at the rate of 12 tons per acre.

On account of the viable seeds of various grains and weeds found in fresh manure it is generally considered a good practice to apply the manure in a rotted condition. At this Station a pile is made a short distance from the buildings and the team is driven over the top of the pile each time manure is added in order to keep the pile firm and to induce rotting. A new pile is started each year and the oldest pile is spread on the fields first. It is true that considerable of the value of the manure is lost in the process of rotting. On the other hand, rotting before applying is a more advisable practice than scattering viable seeds on the land by the use of fresh manure.

The yields shown in the succeeding table are from the second crop after summer-fallow. On two plots the manure was applied previous to summer-fallowing.

MANURE TO AFFECT WHEAT

Plot	Second crop after fallow	Plot Treatment	Yield in Bushels per Acre	
			Yield 1925	Average yield eleven years
1	Wheat......	Fresh manure applied in winter—spring ploughed.......	32·4	19·9
2	"	Fresh manure applied in winter previous to summer-fallow—first year stubble spring-ploughed..........	32·4	20·4
3	"	Rotted manure applied after seeding second crop.......	31·1	21·2
4	"	Rotted manure before ploughing fallow—first year stubble spring-ploughed..............................	33·9	21·3
5	"	No manure—spring-ploughed..........................	31·2	20·2
6	"	Rotted manure applied before the fall ploughing........	38·3	26·3
7	"	Rotted manure before the spring ploughing............	37·0	28·4
8	"	No manure—spring-ploughed..........................	29·4	....

The application of rotted manure just before ploughing appears to be most profitable. The average yield shows the spring application before ploughing to have resulted in the higher yield but this is without doubt partly due to the plot having been spring-ploughed. Spring ploughing has consistently given a higher yield than fall ploughing at this Station.

Fresh manure applied in winter has not increased the yield materially as compared with the plot receiving no manure. Top dressing after seeding with rotted manure has increased the yield only one bushel per acre on a ten-year average. Applying rotted manure on summer-fallow has resulted in an increased yield of one bushel per acre in the second crop after applying.

MANURE TO AFFECT BARLEY

Plot	Second crop after fallow	Plot treatment	Yield in bushels per acre	
			Yield 1925	Average yield nine years
1	Barley	Fresh manure applied in winter—spring-ploughed..........	40·8	28·5
2	"	Fresh manure applied in winter previous to summer-fallow—First year stubble spring ploughed....................	48·3	25·8
3	"	Rotted manure applied after seeding second crop...........	52·5	25·0
4	"	Rotted manure before ploughing fallow. First year stubble spring-ploughed.......................................	46·8	24·1
5	"	No manure—Spring-ploughed..............................	52·5	23·5
6	"	Rotted manure applied before the fall ploughing............	60·8	32·5
7	"	Rotted manure before spring ploughing....................	54·7	33·5
8	"	No manure—Spring-ploughed.............................	43·3	....
9	"	No manure—Spring-ploughed.............................	51·2	....

The applications of rotted manure to affect barley just before ploughing have given the highest yields as was the case in applying to affect wheat. The fresh manure has resulted in a greater increase than when applied to affect wheat.

MANURE TO AFFECT OATS

Plot	Crop	Plot Treatment	Yield in bushels per acre	
			Yield 1925	Average yield nine years
1	Oats	Fresh manure applied in winter—Spring-ploughed	97·6	66·1
2	"	Fresh manure applied in winter previous to summer-fallow—First year stubble spring-ploughed	90·5	58·2
3	"	Rotted manure applied after seeding second crop	93·5	61·2
4	"	Rotted manure before ploughing fallow. First year stubble spring-ploughed	110·2	61·1
5	"	No manure—Spring-ploughed	83·5	56·0
6	"	Rotted manure applied before the fall ploughing	110·5	66·2
7	"	Rotted manure applied before the spring ploughing	105·8	70·6
8	"	No manure—Spring-ploughed	98·6	....
9	"	No manure—Spring-ploughed	93·5	....

Applying fresh manure again shows up well, but these plots invariably show more weeds than those receiving rotted manure.

The nine-year average shows a difference of 14.6 bushels per acre between the plot which was manured just before the spring ploughing and the plot which received no manure. The 1925 difference in yield was 22.3 bushels per acre. The plot which has not received manure is lower in average yield than any other plot.

There is a prevailing opinion that manure makes the crop late in ripening, but it has not been the case in this experiment when rotted manure was applied. and only in some seasons was it true when fresh manure was applied.

GREEN CROPS PLOUGHED DOWN

In more humid climates it is a common practice to grow a leguminous crop to plough down green for the purpose of enriching the soil, and the object of this experiment is to compare the merits of this plan with those from applying rotted manure, for the semi-arid climate found at Scott. The crops have been grown on the summer-fallow and ploughed down. Peas have been ploughed down at two different stages of growth and for three seasons sweet clover has been ploughed down when in bloom. Two plots are summer-fallowed in the usual way and one plot receives an application of 12 tons of rotted barnyard manure previous to ploughing the fallow.

GREEN CROPS PLOUGHED DOWN

Plot	Crop	Plot Treatment	Yield in bushels per acre	
			Yield 1925	Average yield eleven years
1	Wheat	Sweet clover ploughed down in bloom	28·1	....
2	"	Peas ploughed down early July	25·4	20·1
3	"	Peas ploughed down in full bloom (Late July)	27·4	21·5
4	"	Bare summer-fallow	30·1	20·4
5	"	Rotted barnyard manure 12 tons per acre applied before ploughing fallow	37·4	27·1
6	"	Bare summer-fallow	34·3	23·1

Rotted manure before ploughing summer-fallow has given the highest yield for an eleven-year average. Peas ploughed down green have not increased the yields as compared with the crops grown after bare summer-fallow.

Sweet clover has not been grown for a sufficient length of time to compare it as a green-manure crop.

The effects of these treatments in the summer-fallow year are shown in the second crop, in the following table:—

GREEN CROPS PLOUGHED DOWN

Plot	Second crop after treatment	Plot Treatment	Yield in bushels per acre	
			Yield 1925	Average yield ten years
1	Oats	Sweet clover ploughed down in bloom	91·7	....
2	"	Peas ploughed down early July	87·0	52·4
3	"	Peas ploughed down in full bloom (Late July)	85·5	49·9
4	"	Bare summer-fallow	81·7	48·7
5	"	Rotted barnyard manure 12 tons per acre applied before ploughing fallow	92·3	53·3
6	"	Bare summer-fallow	77·0	....

The second crop after treatment shows the barnyard manure to give the highest yield. The sweet clover plot is second highest in yield for 1925 but this crop has not been used long enough to warrant drawing deductions.

SOIL-PACKING

The soil-packer is an expensive machine and unless its use results in a substantial increase in yield the value of this farm implement is questionable. During the past ten years there have been many conflicting experimental results regarding the use of the soil-packer. The experiment dealing with soil-packers as revised in 1922 includes the use of the surface packer, cultipacker, and harrow. The original investigational work at this Station compared the surface, subsurface, and combination packers; but as the results indicated that the surface packer was as effective as the other two for experimental work, only the surface packer is compared with a later type known as the cultipacker. The harrow is used as a check.

All plots are harrowed once after ploughing and the additional treatment given is listed in the following tables:—

PACKING SPRING PLOUGHING

Plot	Crop	Plot Treatment	Yield in bushels per acre	
			Yield 1925	Average yield four years
2–11	Wheat	Harrowed before and after seeding	33·6	22·3
3–12	"	Cultipacked before and after seeding	37·0	24·6
4–13	"	Surface-packed before and after seeding	30·4	23·0
5	"	Harrowed after ploughing	37·6	23·4
6	"	Cultipacked after ploughing	38·0	24·5
7	"	Surface-packed after ploughing	41·8	25·8
8	"	Harrowed after seeding	38·3	24·8
9	"	Cultipacked after seeding	45·0	26·1
10	"	Surface-packed after seeding	31·1	23·9

Small increases in average yield are shown following packing before and after seeding also from plots packed immediately after a spring ploughing. The cultipacker has given an increase in yield of 1.3 bushels when used after seeding but the surface packer shows a decreased yield compared with the plot not packed.

PACKING FALL PLOUGHING

Plot	Crop	Plot Treatment	Yield in bushels per acre	
			Yield 1925	Average yield three years
15	Wheat	Harrowed after ploughing in fall	36·0	27·1
16	"	Cultipacked after ploughing in fall	39·0	31·9
17	"	Surface-packed after ploughing in fall	35·0	29·7
18	"	Harrowed in spring before seeding	39·8	32·0
19	"	Cultipacked in spring before seeding	27·4	25·8
20	"	Surface-packed in spring before seeding	37·1	28·4
21	"	Harrowed after seeding	34·0	26·3
22	"	Cultipacked after seeding	36·0	27·7
23	"	Surface-packed after seeding	32·1	24·9
24	"	Harrowed before and after seeding	32·6	26·1
25	"	Cultipacked before and after seeding	34·1	27·5
26	"	Surface-packed before and after seeding	38·3	28·7

The three-year average shows an increased yield resulting from packing just after fall-ploughing—2.6 bushels per acre for the surface packer and 4.8 bushels per acre for the cultipacker. The difference following other treatments are not consistent.

PACKING OF SUMMER-FALLOW

Plot No's. Duplicate Test	Crop	Plot Treatment	Yield in bushels per acre	
			Yield 1925	Average yield three years
2–15	Wheat	Harrowed just after ploughing	32·9	30·1
3–16	"	Cultipacked just after ploughing	34·0	34·4
4–17	"	Surface-packed just after ploughing	30·4	30·8
5–18	"	Harrowed before seeding in spring	31·9	32·5
6–19	"	Cultipacked before seeding in spring	33·8	31·9
7–20	"	Surface-packed before seeding in spring	30·9	32·9
8–21	"	Harrowed after seeding in spring	34·0	32·4
9–22	"	Cultipacked after seeding in spring	32·7	31·2
10–23	"	Surface-packed after seeding in spring	31·0	30·4
11–24	"	Harrowed before and after seeding in spring	35·1	30·2
12–25	"	Cultipacked before and after seeding in spring	34·1	30·2
13–26	"	Surface-packed before and after seeding in spring	32·2	31·0

While a three-year average is not considered sufficient to warrant drawing conclusions, it is of interest to note the culti-packer used immediately after ploughing for summer-fallow gave an increase of 4.3 bushels per acre for a three-year average. The surface packer, for the same period, merely shows seven tenths of one bushel per acre more than the plot not packed.

Packing of summer-fallow land either before or after seeding has not increased the yield. This conforms with the results of previous experiments conducted at this Station.

This experiment dealing with soil-packers will be continued for several years and the results given in succeeding Annual Reports.

DATES OF SEEDING

An experiment in dates of seeding has been conducted at this Station from 1913 to 1925 inclusive. The object of the experiment is to determine to what extent the time of seeding is a factor in influencing yields. Three different kinds of Grain were included in the test—wheat, oats and barley. The first seedings were made in the spring as early as the condition of the land would permit and were continued at intervals of one week for five successive sowings.

The 1925 results together with a thirteen-year average are presented in the accompanying tables.

DATES OF SEEDING MARQUIS WHEAT ON SUMMER-FALLOW

—	1925 results		Thirteen-year average	
	Number of days to mature	Yield per acre	Average number of days to mature	Average yield per acre
		bush.		bush.
1st date of seeding	126	32·1	125	24·9
2nd "	119	30·6	118	27·9
3rd "	113	30·6	115	24·4
4th "	106	28·2	113	24·7
5th "	106	31·3	109	23·3

DATES OF SEEDING OATS ON SUMMER-FALLOW

		bush.		bush.
1st date of seeding	118	77·4	124	67·2
2nd "	109	82·9	119	69·8
3rd "	103	88·5	114	69·9
4th "	98	89·9	111	65·7
5th "	95	81·5	107	63·4

DATES OF SEEDING BARLEY ON SUMMER-FALLOW

		bush.		bush.
1st date of seeding	117	45·0	124	27·6
2nd "	112	46	112	26·1
3rd "	106	49	114	27·4
4th "	98	47	110	25·6
5th "	93	40·1	105	28·2

Conclusions from these tables are: The second date of seeding has given the highest yield in the case of the wheat. This date is within one week from the commencement of work on the land.

With oats the highest yield was secured from the third date of seeding, which date is two weeks from the time of beginning work on the land.

In barley the fifth date of seeding has given the largest yield, which is a month after the first seeding is possible. In some years higher yields are secured from later seedings, nevertheless, the results, as given in this table, are the average of a thirteen-year period and they should be a fairly authentic guide.

Incidently, early seeding permits of early summer-fallowing. The advantages of the latter operation are discussed in this report under the heading of "Date of Ploughing for Summer-fallow." It therefore follows that any seasonal advantage which may result from late seeding is lost in the following year's crop, when late seeding results in delaying the operation of summer-fallowing.

DATES OF SEEDING—COMPARISON OF MARQUIS AND GARNET WHEAT

In view of the probability of Garnet wheat coming into commercial use in 1926 an experiment in dates of seeding has been conducted during the past season to secure further data on its relative merits as compared with Marquis.

COMPARISON OF DATES OF SEEDING MARQUIS AND GARNET ON SPRING PLOUGHING

Time of Seeding	Marquis Number of days to mature	Garnet Number of days to mature	Marquis Yield per acre	Garnet Yield per acre
			bush.	bush.
April 13	121	115	40·7	36·0
" 21	118	109	43·1	41·5
May 1	113	104	43·1	41·5
" 11	107	98	40·0	40·7
" 21	104	93	36·0	41·5
Average			40·6	40·2

COMPARISON OF DATES OF SEEDING MARQUIS AND GARNET ON SUMMER-FALLOW

			bush.	bush.
April 11	126	123	32·1	35·3
" 21	119	115	30·6	32·1
May 1	113	106	30·6	37·6
" 11	106	98	28·2	27·4
" 21	106	96	31·3	25·9
Average			30·6	31·7

It will be noted from the results of a one-year test on spring ploughing, that the Marquis has a slight advantage in point of yield over Garnet. In the case of summer-fallow seedings, its position is reversed.

It will be further noted that both Marquis and Garnet gave higher yields on stubble than on summer-fallow.

DATES OF SEEDING SUNFLOWERS

In the experiment dealing with dates of seeding of sunflowers, four seedings were made at intervals of ten days each. The last seeding was eaten off by rabbits and was ploughed up. It is apparent from the results that follow that the earlier seedings gave the highest yield. It is planned to continue this experiment another year in order to determine over a period of years the best date to seed sunflowers.

DATES OF SEEDING SUNFLOWERS

—	Date of Seeding	Average height of plants in inches	Stage of Maturity at Harvest	Yield per acre in green weight	Per cent dry matter	Yield per acre dry matter
				tons		tons
Mammoth Russian	May 15	66	5% in bloom	16·20	16·21	2·63
" "	" 26	58	Heads formed	14·20	13·52	1·92
" "	June 5	54	No head formed	11·60	11·72	1·46

CORN—DISTANCE THINNED

The object of this experiment is to determine the best distance in rows to space corn.

All plots were seeded on May 30 on summer-fallow. The seed was sown with a grain-drill set at a rate of 2¾ bushels of wheat per acre. The yields presented here from the different spacings are the average of four plots.

CORN—DISTANCE THINNED

Distance Thinned	Yield per acre Green weight
	tons
Check not thinned	10·78
Plants 6 inches apart	9·28
" 9 "	8·00
" 12 "	8·86

As this is the first year this experiment has been in operation, no deductions are drawn from the year's work.

HORTICULTURE

Horticulture is demanding more attention at this Station each season. The increased interest shown in this line of work by people of the prairies is very marked. There has been a large demand for information on tree-planting and fruit-growing and many requests were received for cuttings.

The various lines of experimental work conducted so far at this Station indicate that horticulture has possibilities of marked expansion all over northwestern Saskatchewan.

During the winter of 1924-25 considerable killing in cross-bred apple trees and cultivated plums was caused by rabbits. The ornamental and shade trees wintered in excellent condition.

Several rows of Caragana, no longer necessary as windbreaks, were removed from the orchard to make room for the planting of newer sorts and varieties of fruit trees.

In November 1925 a small section of the orchard was fenced with chicken netting to protect certain fruit trees against rabbits.

The first seeding in the garden was done on April 20, 1925. There was a plentiful supply of moisture to insure germination, and at no period throughout the growing season did drought retard the growth of vegetables.

VEGETABLES

The climate of northwest Saskatchewan is of such a nature that a great variety of vegetables can be grown with great success. The reader desiring specific information on the varieties of staple vegetables recommended for northwestern Saskatchewan is referred to page thirty-two of the 1924 Scott Experimental Station report.

In the test of vegetables this year, seed from the Central Experimental Farm has mainly been used.

ARTICHOKES

Jerusalem artichokes were planted on May 27 and emerged June 10. The plants reached a height of 5½ feet. The crop was harvested on October 9, and the table test showed them to be of good quality. The yield was 11,326 pounds per acre.

STRING BEANS

Twenty-six varieties of beans were sown on May 26 and emerged June 13. Half of each plot was harvested for green beans, and the remainder left to ripen for seed. The frosts of September 12 destroyed most of the latter before the seed had matured.

DISTANCE OF SPACING.—The seed was spaced 2, 4, and 6 inches apart in the rows. As in 1923, the best results were obtained from 2-inch spacing, whereas, in 1924 the yields favoured 6-inch spacing, thus indicating that in a favourable growing season close planting is desirable for maximum yield.

TABLE BEETS

TEST OF VARIETIES.—Ten varieties of beets were sown on May 12 and harvested October 2. Thining the beets to three inches apart produced better table-beets than where the spacing was closer or wider. The best varieties for table-use were Crosby Egyptian (D and F), Black Red Ball (P. Wright) and Detroit Dark Red (0·6050).

DATES OF SEEDING.—Commencing on April 21 seed of the Detroit Dark Red variety of beets was sown at six ten-day intervals. The early sowings of April 21 and May 1 were coarse and unshapely, whereas the later sowings were even in shape and suitable for table use.

CARROTS

TEST OF VARIETIES.—Eleven varieties of carrots were sown on May 12. The main crop from each was harvested on October 3. The July and August cooking tests proved the Chantenay variety to be superior for table purposes. Varieties recommended are Chantenay, Early Scarlet Horn, and Half Long Scarlet Nantes.

DATES OF SEEDING.—The Chantenay variety of carrots was sown at six different dates, with a ten-day interval between each sowing. This year's results indicate that the earliest sowing gave the heaviest yield. The first seed was sown on April 21 and the carrots were fit for use on July 25. All carrots were thined to 3 inches apart in the row.

CAULIFLOWER

Four varieties of cauliflower were grown. Of the early varieties tested, Henderson Snowball gave the heaviest yield, but the cooking test proved it to be strong in flavour. Two strains of the Autumn Giant gave good results, producing good cutting heads as late as September 29.

CABBAGE

Twenty varieties of green cabbage and four of red were sown in hot-beds and transplanted to the open June 8. All plants made vigorous growth and produced heavy yields. Early varieties recommended are Golden Acre, Jersey Wakefield and Copenhagen Market, and for winter storing, Danish Ballhead and Copenhagen Market.

SOWING IN HOT-BEDS OR OUT-OF-DOORS.—Seed of the Copenhagen Market was sown in the garden on April 20 and transplanted to the cabbage plot June 9. The object of this sowing was to compare the yield from plants started in the open with plants started in the hot-bed. The yield from 20 average heads from plants started in the open was 147 pounds and from plants started in the hot-bed 120 pounds.

DATES OF SEEDING.—The varieties Copenhagen Market and Ex. Amager Danish Ballhead were sown in the garden at ten-day intervals commencing April 21. The results obtained indicate that seeding after May 1 was unprofitable.

BORECOLE OR KALE

This vegetable made vigourous growth, the seed being sown in the hot-bed and transplanted in the garden in June. In the cooking test the curled centre was slightly flavoured, but, nevertheless, a delicious vegetable.

CHINESE CABBAGE

Two Chinese varieties of cabbage were grown, Wong Bok and Pe Tsai seed being sown in the open on June 16. These varieties do not form a head, only the leaves being used. In the cooking test the former was of excellent quality.

CELERY

Fourteen varieties of celery were tested. The total crop of celery harvested was 950 pounds. This was taken from a bed 56 by 30 feet. The quality was good and the bunches averaged about one pound each.

The seed was planted in the hot-bed early in April, and when reaching a height of one inch was transplanted about two inches apart to other boxes in the hot-bed. Most of the plants were transplanted outside in rows four feet apart, with the plants six inches apart in the row. These were left untouched until reaching a height of 8 to 10 inches when the soil was heaped up about the plants until only two or three inches of the tops were visible. It is necessary to hold the stalks closely together when covering with soil, or the growth of the plant will be impaired. At least one other banking with soil is necessary before the end of the growing season.

BLANCHING.—Two methods of blanching were compared, hilling up with soil and blanching with boards. The soil proved effective and more suitable for protection against early frost.

One hundred and twenty-four plants were taken from the hot-bed about June 15 and planted six inches apart each way and a two-foot board fence was placed close to the outside and the plants were watered frequently. The blanching was very satisfactory, but the stalks were not so crisp as those banked with soil. In a very dry season the mass planting would probably be more satisfactory, but, with a fair quantity of rain the planting in rows and banking with soil is to be preferred. Varieties recommended are Golden Self-Blanching, Paris Golden Yellow and Rose Ribbed.

CUCUMBERS

Ten varieties of cucumbers were sown in the garden about the first week in June in rows four feet apart with the plants one foot apart in the row. Due to pollination by bees a good setting of fruit was obtained. The cucumbers were ready for use July 17. From eight rows thirty feet long 275 pounds were harvested. Trials of previous years have indicated outside planting to be more successful than planting in the hot-bed and transplanting to the garden. The best-yielding varieties are Jersey Pickling, Davis Perfect, Early Fortune and Early Russian.

GARDEN CORN

Eighteen varieties of corn were sown in hills May 26. Only the earliest varieties mature in this district owing to the short growing season. The later maturing sorts merely reach the milk stage. Plants from home-grown seed are much earlier and made more vigorous growth than commercial seed. Varieties recommended are Pickaninny A. (Scott), Banting (0-6653), Alpha (Harris), and Howes Alberta Flint (Scott).

CITRON

Three varieties of citron were sown in the garden in rows four feet apart on May 27, and the plants thinned to two feet apart in the row. Two hundred and thirty-three pounds were harvested of the Red-seeded variety from a row thirty feet long. The largest citron weighed thirteen pounds eight ounces.

EGG-PLANT

Two varieties of egg-plant were sown in the hot-bed April 13 and transplanted to the garden June 20. The plants made vigorous growth but the yield was light due to frost damage on September 12. Extra Early Dwarf is a good early variety.

LETTUCE

Nineteen strains of lettuce were sown in the garden on May 12 and a second sowing was made June 27. The seed germinated evenly in both instances. The plants were thinned to six inches apart in the row. An abundant crop of lettuce was obtained throughout the season. Varieties recommended are Iceberg, New York and Grand Rapids.

MUSK MELON

Five varieties of musk melon were sown in the garden in rows on May 27, and the plants thinned to two feet apart in the row. As in the past, no fruit fully matured.

ONIONS

Nineteen varieties of onions were sown April 22 and the main crop was harvested October 21. The best-yielding varieties being Ailsa Craig, Yellow Globe Danvers and Large Red Wethersfield. Southport White Globe proved to be the best pickling onion. Dutch sets were again planted and divided into three groups namely ½, ¼, and ¾-inch sizes. The quarter-inch set gave the greatest yield.

PEPPERS

Six varieties were sown in the hot-bed on April 13 and transplanted to the garden on June 10. The plants were attacked by cutworms. All varieties produced an abundance of peppers, but had to be taken inside to ripen. A satisfactory method of ripening is to hang the peppers from a ceiling in a warm room.

PARSLEY

The variety Champion Moss Curled was grown and bore a luxuriant crop. A single plant taken inside produces sprigs for garnishing purposes during the winter months.

PARSNIPS

Parsnips are easily grown and highly esteemed for table use during the winter months. Six varieties of parsnips were tested. In the past, thinning the plants to two inches apart has been found advantageous. Hollow Crown gave the highest yield.

Dates of Seeding.—Six dates of seeding at a ten-day interval commencing April 21 were continued to June 10. There was a decided falling-off in yield in seedings later than May 21.

PEA

Twenty-six varieties of peas were sown on May 11. Half of each plot was harvested as green peas, and the remainder left on the vines to ripen for seed. By following this plan a home-grown seed supply is assured. The best-yielding early, medium, and late-maturing varieties are given in the following table:—

VARIETIES OF PEAS

Variety	Seedsman	Ready for use
Early—		
English Wonder	0-6741	July 25
Early Morn	Scott	" 20
Eight Weeks	Scott	" 18
American Wonder	P. Wright	" 25
Medium Season—		
Gregory Surprise	Scott	" 30
Bromfield Six Weeks	Child	" 21
Gradus x English Wonder	0-2346	" 24
Late Maturing—		
Stratagem	McDonald	August 8
Gradus	0-6739	" 15
Western Beauty	Scott	" 10
Potlatch	Scott	" 15

DATES OF SEEDING.—Three varieties were sown on April 21 at intervals of ten days for four successive sowings. The object being to prolong the season for green peas. The first sowing was ready for use July 9 and the last sowing August 15. Green peas were then available for table-use from July 9 to September 9.

PUMPKINS

Seven varieties were sown in hills May 27. An excellent crop of pumpkins was harvested September 13. The following gave the largest yield: Connecticut Field 212 pounds, Fort Berthold 172 pounds, and the King of the Mammoths 166 pounds. These yields were secured from three hills nine feet apart each way. The largest pumpkin harvested weighed 63 pounds 8 ounces.

POTATOES

Twenty varieties were included in the variety test of potatoes. They were planted on summer-fallow May 20 and dug September 25. They were planted in rows three feet apart, and the sets were dropped twelve inches apart in the row.

While the season was ideal for grain growing, the development of tubers was not satisfactory. In all varieties the percentage of unmarketable potatoes was high. Potato-diseases were much more prevalent than is usually the case, particularly was this true of varieties introduced for the first time.

The table following gives the comparative yields of the varieties grown the past season, and the average yields of marketable potatoes for nine years of the varieties grown for that length of time.

POTATO—TEST OF VARIETIES

—	Yield of Marketable	Yield of Unmarketable	Per cent small	Total Yield	Average yield of marketable potatoes for nine years
	bushels	bushels	bushels	bushels	bushels
Gold Coin	693·7	129·1	15·6	822·8	310·7
Carman No. 1	661·4	121·0	15·5	782·5	299·5
Prince Albany	605·0	88·7	12·8	693·7	291·0
Wee MacGregor	605·0	96·8	13·8	701·8	287·4
Dreer Standard	584·5	121·0	18·1	669·5	283·5
Empire State	596·9	121·0	16·8	717·9	281·8
Irish Cobbler	556·6	250·1	31·0	806·7	255·5
Everitt	395·3	153·2	27·9	548·5	238·7
Dalmeny Beauty	653·4	177·5	21·4	830·9	....
Morgan Seedling	645·3	104·9	13·9	750·2	....
Green Mountain	645·3	80·7	11·1	726·0	....
Factor	637·3	129·1	20·3	766·4	....
Sutton Abundance	572·7	112·9	19·1	592·4	....
Netted Gem	427·5	161·3	27·4	588·8	....
Early Ohio	411·4	121·0	22·7	532·4	....
Golden Russet	403·3	153·2	27·5	556·5	....
Bovee	387·2	129·1	25·0	516·3	....
Early Six Weeks	36·0	112·9	23·7	475·9	....
Gold Nugget	354·9	112·9	24·1	467·8	....
Royal Russet	306·5	217·8	41·5	524·3	....

FIELD LOTS OF POTATOES

Varitey	Size of field	Yield of Marketable	Yield of Unmarketable	Per cent Small	Total yield per acre
	acres	bushels	bushels	bushels	bushels
Wee MacGregor	·40	287·1	37·7	8·8	424·8
Everitt	·26	214·1	73·4	25·5	287·5
Irish Cobbler	·20	175·8	70·8	28·7	246·6
Early Ohio	·41	163·0	47·1	22·4	210·1

Field lots of potatoes were disappointing. In the case of Wee MacGregor and Irish Cobbler certified seed from Alberta was planted. The latter was free from disease when field-inspected but the former contained over four per cent of blackleg.

For an early potato Everitt is preferred to Irish Cobbler on account of the deep eyes of the latter. For a late or main crop Wee MacGregor is very much in demand because it gives a high percentage of large to medium-size potatoes.

RADISH

Eleven varieties of radish seed were sown. The variety Leafless Twenty Days (McKenzie) was the first variety ready for use and was of excellent flavour and texture. French Breakfast was second in point of earliness and flavour.

RHUBARB

Rhubarb is perfectly hardy in northwestern Saskatchewan and when once planted continues to yield crops for many years.

VARIETIES.—The recommended varieties are Victoria and Linnaeus. Ruby, a named variety recently introduced from the Central Experimental Farm, Ottawa, is superior in quality to any of the five varieties under test and gives promise of gaining in popularity.

GROWING FROM SEED.—The cheapest and most certain method of maintaining a plentiful supply of rhubarb has been from seed. To insure success, the seed is sown early in the spring in rows 18 inches apart and kept cultivated throughout the season.

GROWING FROM ROOTS.—Yearling roots or divisions of older roots, may be used for starting a rhubarb plantation, in which case planting is usually done in the early spring, but good results have been obtained from planting in September. The roots are set so that the crowns are level or slightly below the surface of the ground. Planting four feet apart each way permits of cultivation both ways.

CULTURE.—During the first season none of the stalks are removed from the plants, as it is essential that the roots become well established. In the fall the roots are given a liberal dressing of rotted manure and the manure is dug into the soil the following spring.

During the second spring or summer the larger stalks may be pulled freely, the smaller ones being left to assist in maintaining the plant. Some plants will send up seed stalks. These are promptly removed with a knife, for the production of seed is exhaustive to the plant.

RENOVATING OLD PLANTATIONS.—When rhubarb roots become old they are likely to produce small stalks. Under such conditions old roots are better dug up and divided for starting a new plantation. In the case of bacterial disease which causes the crowns to decay the diseased plants should be taken up and burnt, and a new bed started from seed or from plants from another source.

WINTER PROTECTION.—The roots of rhubarb are hardy requiring no winter protection, although covering the crowns with from four to six inches of barnyard manure prolongs the growth the following year.

RHUBARB FOR WINTER USE.—The method which is meeting with success at this Station is to dig the roots before freeze-up. The roots are then placed in a barrel which is partly filled with cut straw, they are then packed with cut straw so as to merely cover the crowns. For continuous growth the straw should be kept moist, and best results are obtained when the cellar temperature is kept between 50° to 60° F. The rhubarb growth from this method is much earlier, richer in colour and flavour than when grown for winter use in the ordinary way by exposing to frost before planting in soil. During the winter of 1924-25 fresh rhubarb was available from the second of December to the middle of April.

SQUASH

Seven varieties of squash were sown in the garden May 27 in hills nine feet apart. From twenty one hills 320 pounds of squash was harvested. The Hubbard variety is preferred on account of its excellent variety.

SPINACH

Two varieties of spinach were sown in the garden on May 27. The King of Denmark was fit for use for only a short period, while the New Zealand remained edible until late in the season.

SALSIFY

Two varieties were grown. The seed being sown on May 27 and harvested October 9. The roots were of medium size. The production from a single row 30 feet long was fifteen and one half pounds.

SWISS CHARD

Three varieties of this vegetable were sown. The seed was sown on May 22. Swiss chard makes excellent greens and maintains a supply for a longer time than spinach.

TURNIPS

Six varieties of turnips were grown, good yields being obtained from all varieties but the summer turnips were of strong flavour. For winter use, Swedes are more valuable on account of their keeping qualities.

TOMATOES

Thirty-eight varieties were compared. The past season was very favourable for tomatoes. Three hundred and eighty-six pounds were ripened on the vines before the first killing frost. Nine hundred and ninety-seven pounds of well-advanced tomatoes were picked green, many of which ripened inside in a few days.

Ripening tomatoes at Scott. Note the method of pruning to hasten ripening.

The method of growing was to plant the seed in boxes in the hot-bed about April 12 and reset about three inches apart when an inch or two high. When four or five inches high the glass was gradually raised for a greater time each day and later the boxes were taken out of the hot-bed. After all danger of frost was past, transplanting to the garden was done, placing the plants four feet apart each way and deep enough so that only one-fourth of the plant was above ground. The plants were often beginning to bloom when transplanted to the garden. All of the laterals were kept pruned and only the main stem was allowed to grow and this was tied to a stake so that the tomatoes were off the ground and exposed to the sun. Alacrity C.E.F. produced the largest yield of ripe tomatoes. The next in point of yield was Bonny Best

PRUNING EXPERIMENT.—This consists of planting the tomatoes two feet each way and cutting off the tops above the first, second and third trusses. The cutting-back hastened the ripening of the fruit but decreased the yield of ripe fruit.

RIPENING OF GREEN TOMATOES.—Green tomatoes were packed in single layers between prairie wool and stored in a warm room. The fruit was carefully picked over each week. Records kept of the quantities stored and ripened showed a loss of ten per cent. The best varieties for storing are Alacrity (C.E.F.), Bonny Best (Stokes), Pink (C.E.F.), Red Canner (Morse) and Self-Pruning (Burpee).

VEGETABLE MARROW

Three varieties were sown in hills in the garden May 27. A good crop was harvested. The English vegetable variety gave the largest yield. The largest vegetable marrow weighed thirty pounds.

SOWING VEGETABLES IN THE FALL

A number of seeds were sown late in the Autumn of 1924 and compared with early spring sowing 1925.

FALL-SOWN VERSUS SPRING-SOWN VEGETABLES

Vegetable	Variety	Sown in Fall Ready for use	Sown in Spring Ready for use	Fall sowing Total Weight		Spring sowing Total Weight	
				lb.	oz.	lb.	oz.
Onion	Large Red Wethersfield	Sept. 21	Sept. 21	1	8	1	15
Beet	Detroit Dark Red	July 7	July 22	22	..	87	..
Radish	Scarlet Turnip White tipped	June 6	June 13	..	..	..	..
Lettuce	Grand Rapids	June 23	July 1	..	..	..	..
Spinach	Victoria	May 28	June 13	..	..	..	..
Carrot	Chantenay	July 22	July 24	61	12	56	8
Parsnip	Hollow Crown	Oct. 9	Oct. 9	64	..	43	..
Turnip	Extra early purple Top Milan	June 6	July 1	30	..	39	..
Cabbage	Copenhagen Market	Oct. 10	Oct. 10	30	..	87	..

A study of the table shows the fall-sown vegetables were ready for use earlier than the spring-sown. The germination in all varieties was not as uniform in the fall-sown and this accounts for the variation in yields.

HOME-GROWN VEGETABLE SEED

The success or failure of vegetable growing is dependent to some extent on the variety. The results of our variety tests indicate, that home-grown vegetable seeds have an advantage over most commercial sorts. For this reason it was thought advisable to list vegetables from which seeds may be annually collected. The list comprises asparagus, beans, corn (early varieties) lettuce, peas, pumpkin, radish, rhubarb, spinach and squash. By carrying the roots over winter, seed may be obtained from beets, cabbage, carrots, cauliflower, parsnips and turnips.

TREE FRUITS

APPLES

Very little progress can be reported with the growing of apples, a considerable number of the varieties being winter-killed during the winter of 1924-25. This is attributed to the gnawing of the bark by rabbits. The Osman Crab, Alberta and Jewel varieties continue to thrive well. A number of the branches have been so heavily laden with fruit that supports were necessary.

PLUMS

The native plums came through the winter in excellent condition and continue to do well. Many of the trees were heavily laden with fruit. The trees when in full bloom make a very attractive display and are greatly admired by visitors at the Station. The cultivated varieties of Sapa and Opata were badly damaged by rabbits, but during the growing season they made a strong growth which gives every promise of bearing fruit the coming year. The Rocky Mountain or Sand Cherry came through the winter in excellent condition and bore a heavy crop of fruit, while the Compass Cherry was badly winter-killed. The latter cherry is a late-maturing variety, and to date has not ripened fruit at this Station.

SMALL FRUITS

CURRANTS

The red and white currants bore fairly good crops, but the black currants were not so productive, being damaged by frosts at time of setting. One noticeable feature was the vigorous new growth during the growing season.

GOOSEBERRIES

All varieties of gooseberries came through the winter in good condition and bore abundant crops, those from Duncan, Charles and Silvia being exceptionally large.

RASPBERRIES

All varieties came through the winter in good shape. The canes were protected during the winter by bending down and covering with soil. Owing to the drought the previous season there was little growth and no fruit. The new plantation set out in the spring made very satisfactory growth.

STRAWBERRIES

A new plantation both of ever-bearing and summer-bearing varieties were started in the spring. All plants thrived well, and give every promise of bearing fruit the coming year.

The plants from the old plantation came through the winter in excellent shape.

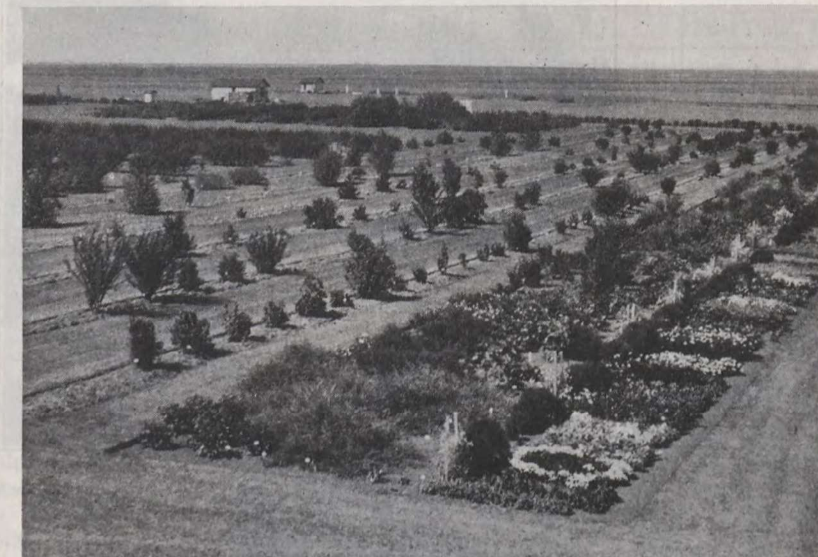
ORNAMENTAL TREES AND SHRUBS

Trees and shrubs in the arboretum came through the winter in excellent shape with the exception of willows which were badly winter-killed owing to damage from rabbits. The bush honeysuckle, lilac's and *Potentilla fruticosa* bloomed profusely. The honeysuckle in particular is to be recommended, being perfectly hardy and sure to come in bloom each season.

PERENNIAL FLOWERS

Hybrid roses are hardy but require winter protection.

The perennials or herbaceous plants follow closely the flowering shrubs and are suitable for planting on the prairies. With even a light rainfall good bloom can be obtained. The following are some of the hardiest of the perennial flowers. Iceland poppy (*Papaver orientale*), *Aquilegia* (columbine), *Pyrethrum* (*roseum*), *Polemonium* (*Jacob's ladder*), *Gypsophila paniculata* (Baby's breath, *Delphinium* (perennial larkspur), *Hemerocallis* (day lily), Iris, and *Hesperis matronalis* (sweet rocket).

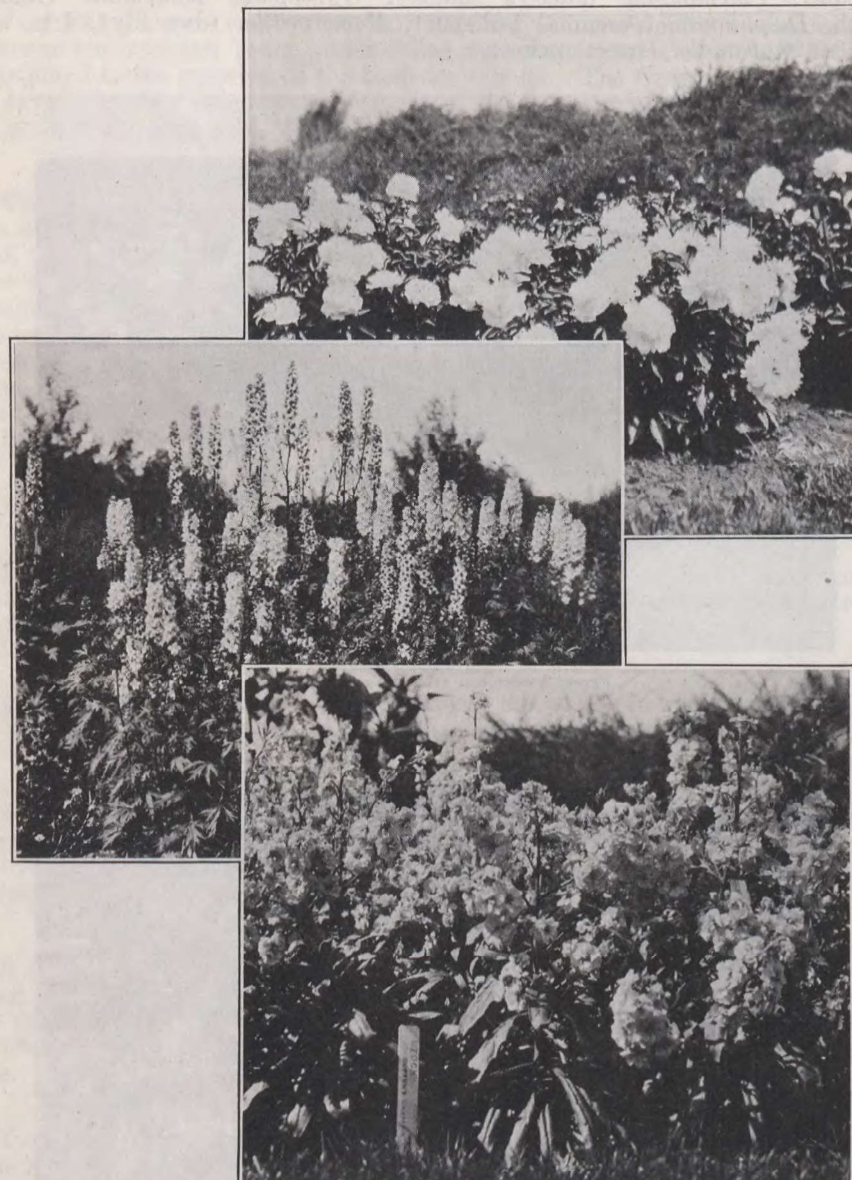


Flower border and arboretum, Scott, 1914.

Flower border and arboretum, 1925.

The usual method to protect perennial flowers is to cover in late autumn with burnt-out manure. The following perennial plants should be given winter protection: Iceland poppy, *Pentstemon barbatus*, *Dianthus* (pinks), Californian poppy. All other varieties tested to date are perfectly hardy.

Of all hardy flowers paeonies stand well in the foreground and make an exceptionally fine showing. The blooms are large and of various colours.



(Top) Paeonies at Scott, with a background of bush honeysuckle (Centre) Delphinium, a hardy perennial. (Bottom) Virginian stocks, a recommended annual.

Practically all varieties are fragrant. The foliage is glossy, and of a rich green colour rendering the plant very ornamental even when not in bloom. Keen interest is always shown by visitors in these hardy perennials.

Paeonies may be either planted in the spring or fall. The latter is preferred for the reason that better root development is obtained when the buds are dormant. Whether planted in the spring or fall they should be protected the first winter. Covering after the first winter does not appear necessary.

The dates of the first and last bloom of some of the more common perennial flowers are given in the table following. As in the case of annual flowers, two and one-half degrees of frost on September 13 affected the bloom of some of the tender sorts.

Name	Period of Bloom 1925	
	First Date	Last Date
Papaver nudicaule (Iceland poppy)	May 17	Aug. 10
Aquilegia (columbine)	" 18	July 31
Delphinium (perennial larkspur)	June 6	Aug. 27
Dicentra (bleeding heart)	" 14	July 27
Chrysanthemum Leucanthemum (ox-eye daisy)	" 16	Sept. 25
Hesperis matronalis (sweet rocket)	" 16	July 7
Dianthus (sweet william)	" 30	Aug 17
Hemerocallis (day lily)	" 30	July 8
Papaver orientale (oriental poppy)	July 2	Aug. 24
Achillea (the pearl)	" 3	Sept. 29
Paeonies	" 3	July 28
Lychnis chalcedonia (Jerusalem cross)	" 5	Aug. 28
Gypsophila paniculata (baby's breath)	" 15	Sept. 3
Gypsophila centifolia	Aug. 10	" 20

Gladioli came in bloom August 25 and dahlias July 23. Both ceased flowering on September 13 when damaged by frost.

Pyrethrum roseum does not flower the first season when raised from seed. Delphinium and *Lychnis chalcedonia* do not usually come into bloom the first season on account of the short season. It is of particular interest to note that the delphinium and lychnis started from seed in the spring both flowered. This may be attributed to the favourable season—the frost-free period being 101 days.

ANNUAL FLOWERS

One hundred and twenty-five varieties of annual flowers were grown. Several were started in the hot-bed and transplanted early in June. The display of the different colours was very attractive and greatly admired by visitors.

Provided the seed of annual flowers is sown outside in May, the following will give a succession of continuous bloom throughout the season. The date of the last bloom in a good many cases was September 13, on which date two and one-half degrees of frost was registered.

ANNUALS—PERIOD OF BLOOM

Name	Period of Bloom 1925	
	First Date	Last Date
Gypsophila Elegans	June 22	July 29
Brachycome (swan river daisy)	" 28	Sept. 2
Tagetes signata pumila	" 29	" 17
Asperula azurea	July 2	Aug. 28
Cosmea Single and Double	" 3	Sept. 10
Alyssum, Little Dorrit	" 5	" 29
Virginian stock	" 5	" 3
Bartonia aurea	" 6	Aug. 29
Coreopsis cardaminifolia	" 7	Sept. 2
Coreopsis marmorata	July 9	Sept. 10
Mignonette, sweet scented	" 9	" 13
Zinnia Fireball	" 9	" 4
Linum rubrum	" 11	Aug. 22
Linaria, mixed	" 11	" 22
Coreopsis tinctoria	" 12	Sept. 10
" *drummondii*	" 12	" 10
Rudbeckia, Golden Sunset	" 12	" 2
Dimorphotheca aurantiaca (African daisy)	" 13	" 6
Coreopsis atrosanguinea	" 14	" 12
Sunflowers, minature	" 14	" 9

ANNUALS—PERIOD OF BLOOM—Continued

Name	Period of Bloom 1925	
	First Date	Last Date
Candytuft, sweet scented	July 15	Sept. 15
Sweet peas	" 15	" 17
Candytuft Imp., White Spiral	" 16	" 15
Nasturtium, tall	" 18	Aug. 29
Schizanthus, Rose and Amber	" 19	Sept. 15
Calendula, Orange King	" 20	" 2
Helichrysum, mixed	" 20	" 12
Lavatera, Loveliness	" 20	Aug. 28
Nasturtium, Tom Thumb	" 20	" 29
Clarkia, Salmon Queen	" 22	" 18
Scabious, mixed	" 22	Sept. 10
Chrysanthemum, Mixed	" 23	" 17
Godetia, mixed	" 23	" 3
Malope, mixed	" 23	" 6
Poppy, Shirley	" 23	" 17
Portulaca, mixed	" 23	" 13
Nemesia, Large-Flowered	" 28	" 5
Nicotiana	Aug. 2	" 13
Larkspur, Pink Pearl	" 28	" 13
" Rosy Scarlet	" 30	" 13

HOME-GROWN FLOWER SEEDS

The reason advanced by a number of visitors for not having more flowers is the annual cost of the seed. This is a small item when home-grown seeds may be easily procured.

Flower seeds were collected from the following annual and perennial plants in the autumn of 1925:—

ANNUALS

Ageratum White.
" Blue.
Asperula azurea.
Alyssum Little Dorrit.
Bartonia aurea.
Brachycome (Swan River Daisy).
Browallia.
Calendula.
Cosmea.
Coreopsis tinctoria.
" *Cardaminifolia.*
" *marmorata.*
" *Drummondii.*
Candytuft.
Clarkia.
Chrysanthemum.
Dimorphotheca.
Gypsophila. elegans.
Godetia.
Linaria.
Linum.
Lavatera.
Mignonette.
Malope.
Nemesia.
Portulaca.
Shirley Poppy.
Salpiglossis.
Schizanthus.
Sunflowers, miniature.
Scabious.
Tagetes signata pumila.
Virginian Stock.

PERENNIALS

Aquilegia.
Californian Poppy.
Dianthus Pink.
Delphinium.
Dictamus. Fraxinella.
Gypsophila paniculata.
Helenium autumnale.
Hesperis matronalis.
Iceland Poppy.
Lychnis chalcedonica.
Oriental poppy.
Perennial larkspur.
Pyrethrum.
Pinks.
Polemonium, white.
Polemonium, blue.
Pansy.
Paeony, Octave Demay.
" Couronne d'Or.
" Madame De Verneville.
" Felix Crousse.
" Victor Lemoine.
" Marie Stewart.
" La Tulipe.
" Duchesse de Nemours.
Sweet William.

Tulips are the most showy of all spring flowers and thrive well on the prairie. Bulbs planted late in the autumn bloom in May and June of the succeeding summer.

CEREALS

The season of 1925 was in many respects favourable for the production of cereal crops. The spring opened a little earlier than usual with ample moisture for germination and all crops got away to a good start. The months of April and May passed without any frosts severe enough to give the crops a setback. The heavy rains came during the two main growing months—June and July—when a total of 6·16 inches of rainfall was recorded.

The yields this season were well above the average, yet in no cases were any exceptionally high yields harvested. The hot weather and dry winds during the latter part of July and first week in August rapidly ripened early varieties, thus reducing the yields to some extent. This was not so apparent with later-maturing cereals.

During the past two years, seeding in "Rod Rows" has been followed. The rows are one rod in length and each variety or strain is replicated four times. In addition to being more accurate, this system has many advantages over the usual procedure. The same number of kernels are planted in each plot regardless of the variety sown. It permits the testing of many varieties over a small area. Border effect is practically done away with. The increased replication of plots helps to take care of soil variation. There were three hundred and thirty-five plots devoted to rod-row tests this year, which permitted the testing of forty-five varieties or strains of wheat, eighteen of oats, nineteen of barley and seven of peas.

A further departure in cereal work this year was the introduction of the "head-row" plots. This work consists of watching for outstanding plants or heads differing markedly from the parent plant. The seed from each head is sown in a single row. The rows are sown a foot apart and the seeds dropped from two to four inches apart in the row. Opportunity is thus give to study closely the progeny of the individual plants. By a close study of the progeny and selections, new and superior strains can often be originated. Approximately three hundred head-rows were grown this season and it is planned to increase the number to at least fifteen hundred next year.

Variety tests with the commonly grown varieties were conducted as usual on one-fortieth-acre plots sown in duplicate. One hundred and forty of these plots were devoted to cereal work. All varieties grown in the regular test-plots were included in the rod-row plots, together with a large number of selections and unnamed hybrids. Any new varieties or strains which perform creditably in the rod-row plots will later be included in the regular test-plots.

All crops were practically free from disease. Traces of rust appeared during the latter part of August, but owing to the dry weather prevailing then the damage was nil.

SPRING WHEAT

Eighteen varieties of spring wheat were tested in 1925. The plots were seeded on April 17 and April 21 at the rate of 1½ bushels per acre. A moderately warm spring and a plentiful supply of moisture resulted in even stands in all varieties. Weather-conditions permitted tillering to proceed uniformly and fairly rapidly. At no time were there any spells of rapid growth during the growing period, but rather the season was characterized by a steady moderate growth throughout. One chief feature of the plots this year was the uniform character of their growth. A good quality of grain was produced and the season's yield should present a fairly accurate guide of the relative merits of the varieties under test.

Following are the tabulated results obtained:—

WHEAT—TEST OF VARIETIES OR STRAINS

Sown on Fallow April 17 and 21, 1925

Name of Variety	Original Source	Date of Ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Yield of of grain per acre	Weight per measured bushel after cleaning
				inches		bushels	
Red Bobs..........	Wyler............	Aug. 18..	123	35	9·5	40·7	62·0
Early Triumph......	Wheeler..........	" 18..	123	34	10·0	39·2	62·5
Garnet, O. 652.......	Ottawa..........	" 14..	119	34	9·5	38·4	62·5
Acme, Sask. 450.....	Sask............	Sept. 2..	135	43	6·0	37·6	62·7
Kubanka, Sask. 6....	Sask............	Aug. 31..	133	45	6·0	36·4	63·0
Reward, O. 928......	Ottawa..........	" 17..	122	38	9·5	36·4	63·6
Supreme, Sask. 603..	Sask............	" 19..	124	34	9·5	35·6	62·8
Producer, O. 197.....	Ottawa..........	" 18..	123	33	9·0	35·6	63·0
Kitchener..........	Wheeler..........	" 27..	129	38	9·3	34·1	62·5
Marquis, O. 15.......	Ottawa..........	" 21..	126	36	9·6	33·7	63·0
Red Fife, O. 17......	Ottawa..........	" 30..	132	38	9·2	33·7	61·0
Marquis, 10 B (Wheeler's)........	Wheeler..........	" 21..	126	36	9·7	32·9	63·0
Crown, O. 353.......	Ottawa..........	" 12..	117	33	9·8	32·5	61·3
Major, O. 522........	Ottawa..........	" 15..	120	37	8·0	32·3	62·0
Early Red Fife O. 16.	Ottawa..........	" 25..	127	40	9·2	31·9	63·5
Golden.............	Sask............	" 22..	124	37	9·8	31·5	62·0
Brownie, O. 491......	Ottawa..........	" 17..	122	36	9·3	30·9	63·0
Kota...............	N. Dakota........	" 23..	125	39	7·5	30·2	62·1

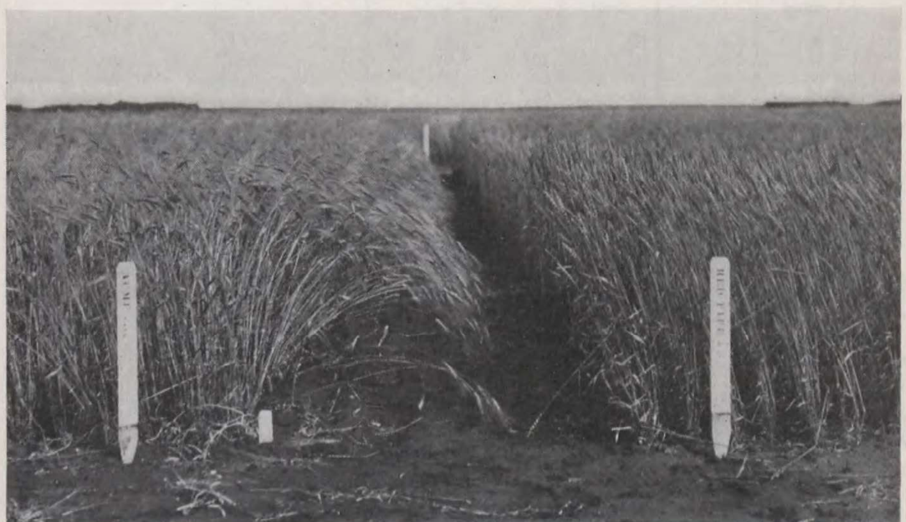
As one year's results do not indicate the true value of a variety, the three- and seven-year averages as presented in the following table are a more authentic indication of the comparative values of the different varieties.

WHEAT——THREE AND SEVEN-YEAR AVERAGES

Variety	Original Source	Yield of Grain per acre	
		Three year Average	Seven year Average
		bushels	bushels
Kitchener............................	Wheeler............................	29·2	26·4
Red Bobs............................	Wyler............................	31·8	26·1
Red Fife O. 17........................	Ottawa............................	26·8	24·9
Marquis O. 15........................	Ottawa............................	27·5	24·0
Garnet O. 652........................	Ottawa............................	27·6	22·0
Supreme............................	Sask............................	31·4	..
Early Triumph........................	Wheeler............................	30·8	..
Acme, Sask. 450........................	Saskatoon............................	28·6	..
Kubanka, Sask. 6	Saskatoon............................	28·1	..
Marquis 10 B (Wheeler's)..............	Wheeler............................	27·1	..
Kota............................	North Dakota........................	22·7	..

At the present time Marquis is undoubtedly the most popular variety of spring wheat over the greater portion of the wheat-growing area of northwestern Saskatchewan—a position it has well merited. The tendency of late, however, among wheat growers is toward trying some of the other varieties. When it is considered that Saskatchewan has an area of over 13,000,000 acres under wheat, covering many distinct types of soil, and that no two varieties of wheat yield exactly the same, grown under similar soil conditions, it is only reasonable to expect that out of the many varieties and strains now being tested, each district should be able to secure a variety or strain that is best suited to its particular type of soil. In this connection co-operative experiments with Illustration Stations and with farmers throughout the province are being carried on to test some of the more promising varieties of wheat and other cereal crops.

Garnet, a cross between Preston A and Riga M, was originated by the Central Experimental Farm at Ottawa. It is one of the most promising of the new wheats. In a seven-year test it has yielded only two bushels less per acre than Marquis and has ripened nine days earlier. In other characteristics it compares favourably with Marquis. In a six-year average, 1919-24 inclusive, it has yielded 1·7 bushels more than Ruby and ripened about two days earlier. It is not expected that this wheat will take the place of Marquis here, but it will likely displace Ruby as an early maturing variety and should become very valuable in certain districts.



Strength of straw in wheat. Note the weak straw of Acme (Durum wheat) on the left.

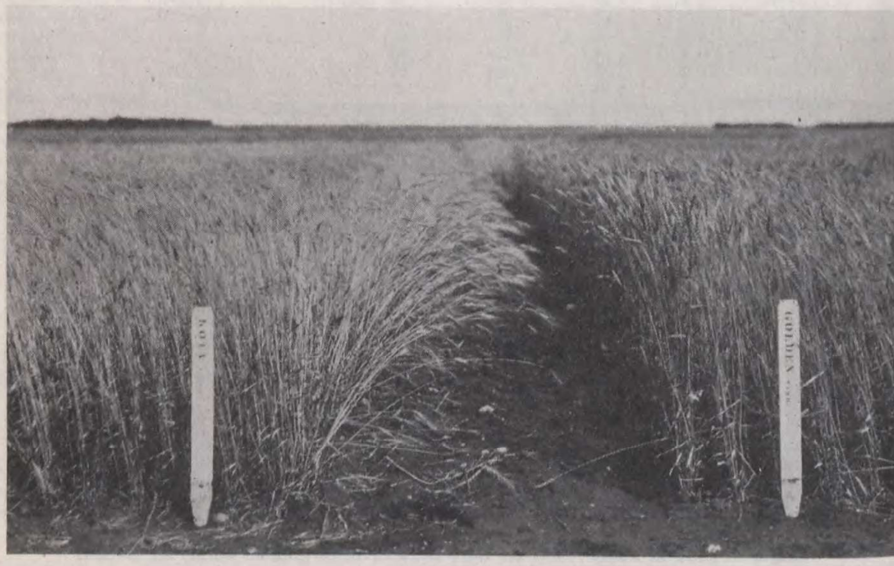
Reward is another promising early-maturing variety which was obtained from a cross made at Ottawa between Marquis and Prelude. In a two-year average it has excelled Marquis in yield by one bushel and has ripened nine days earlier. It has, however, been grown for only two seasons at this Station and consequently no definite opinion can be formed. It is easily recognized on account of its pubescent (hairy) chaff, a characteristic which it inherits from its Prelude parent.

Kitchener is one of Dr. Wheeler's introductions, obtained by a selection out of Marquis. It has yielded 2.4 bushels more than Marquis and ripened four days later in a seven-year average. Compared with Red Fife it has yielded 1.5 bushels more and ripened one day earlier in the same period of years. In districts with a reasonably long growing season where rust is not a limiting factor in crop production, it should be worthy of a trial.

Red Bobs, Wyler's selection, is similar to Kitchener in yield. It is slightly earlier than Marquis, but is considered objectionable in rust districts on account of its susceptibility to this disease. This selection, made by R. O. Wyler out of the original Red Bobs developed by Dr. S. Wheeler, is very similar to Early Triumph.

Early Triumph and Supreme are strains selected from Red Bobs by Dr. S. Wheeler. Both these wheats have made a good showing in the three-year average, but like the parent sort they are susceptible to stem-rust. They are, however, worthy of a trial in districts where rust is not a controlling factor in crop production.

Kota was obtained from Russia in 1903 by Professor H. L. Bolley of North Dakota Agricultural College. It is of fair milling value. It is also found to be resistant to certain biologic forms of stem-rust, a fact which has facilitated its rapidly growing popularity in rust areas. Kota is nevertheless extremely weak in the straw, especially on the richer soils. Other faults are its low yield and susceptibility to loose smut. It is the lowest variety in point of yield this year as well as in the three-year average. Both in 1923 and 1925 it lodged badly. In an experiment dealing with the control of smut, Kota showed a higher percentage of loose smut than Marquis.



Strength of straw in wheat. Weak-strawed Kota on the left.

Kubanka and Acme are both durum wheats. Due to being more resistant to black stem-rust, they are likely to outyield the common wheats in the areas where attacks from stem-rust are severe. On the other hand, their susceptibility to lodging at this Station has been very apparent, and, while the yields are fairly high, the price does not offset the extra yield, as there is no stable market for durum wheats.

Golden (Sask.) is a variety obtained from the University of Saskatchewan in 1924.

Brownie is a cross-bred variety introduced from Ottawa in 1924. It is easily distinguishable from other varieties by its smooth reddish-brown chaff. Ripens earlier than Marquis and gives a fair yield.

Producer was obtained at Ottawa by crossing Preston with Riga. It was introduced into the tests in 1924. In a two-year test it has ripened slightly earlier than Marquis and given a good yield, but is rather weak in the straw.

Major and Crown are two cross-bred introductions from Ottawa in 1925. Both varieties ripen about a week earlier than Marquis. Major is a long-straw variety but has a tendency to be weak.

OATS

Fifteen varieties or strains of oats were tested in 1925. The plots were sown in duplicate on May 1. The rate of seeding was 2 bushels per acre for all varieties excepting the hulless, which were seeded at the rate of 1¼ bushels.

The results obtained are presented in the following table:—

OATS—TEST OF VARIETIES OR STRAINS

Sown on fallow May 1, 1925

Name of Variety	Source	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Yield of grain per acre	Weight per measured bushel after cleaning
				inch		bush.	lb.
Leader	H. McF.	Aug. 16	107	36	9·5	88·5	36·0
Legacy, O. 678	Ottawa	" 10	101	36	9·2	87·1	38·0
Banner, Sask. 144	Sask.	" 13	104	39	9·5	85·7	36·0
Gold Rain	Svalof, Sweden	" 11	102	40	9·8	84·3	40·0
Gerlach	Sask.	" 15	106	38	9·5	82·9	38·0
Banner, O. 49	Ottawa	" 12	103	38	9·5	76·0	35·1
Victory	Svalof, Sweden	" 15	106	37	9·8	76·0	41·1
Longfellow, O. 478	Ottawa	" 10	101	40	9·0	75·4	38·0
Columbian, O. 78	"	" 15	106	37	9·3	67·1	41·1
Prolific, O. 77	"	" 15	106	37	9·7	65·7	42·0
Alaska	Ont. Agr. Coll.	" 2	93	35	8·5	64·6	40·2
O.A.C. No. 3	"	" 3	94	35	9·0	64·3	38·0
Cole, Sask. 795	Sask.	July 31	91	32	10·0	63·6	35·2
Laurel, O. 477 (hulless)	Ottawa	Aug. 9	100	35	9·5	59·8	53·0
Liberty, O. 480 (hulless	"	" 8	99	37	9·0	39·4	51·5

It will be noted that Leader is the highest-yielding variety in 1925 with Legacy, a new introduction from Ottawa this year, standing second. One year's result does not give a true comparison of the value of the different varieties. The four- and eleven-year averages as presented below are a more accurate guide to the relative merits of the varieties under test.

OATS—FOUR AND ELEVEN-YEAR AVERAGES

Variety	Source	Yield of grain per acre	
		Four-year average	Eleven-year average
		bush.	bush.
Banner, O. 49	Ottawa	63·1	67·3
Gold Rain	Svalof, Sweden	66·8	67·2
Victory	"	62·9	66·8
Gerlach	Sask.	65·5	....
Leader	H. McF.	64·2	....
Longfellow, O. 478	Ottawa	57·7	....
Alaska	Ont. Agr. College	45·8	....
Liberty, O. 480	Ottawa	36·8	....

Banner has excelled all other varieties in point of yield over a duration of several years, and is perhaps as desirable as any other variety in strength of straw.

Victory is a close competitor of Banner in point of yield, but in favourable seasons it shows a tendency to lodge.

Gold Rain is a medium early oat, a high yielder and, as a rule having a higher weight per measured bushel than most common varieties. The hull, however, is of a decided yellow colour which makes it rather unpopular.

Gerlach (Sask) was obtained from the University of Saskatchewan which, in turn, obtained it from P. Gerlach, Allen, Sask.

Leader is a side-oat. In point of yield it compares favourably with Banner but is shorter and coarser in the straw.

Longfellow, a cross between Banner and Tartar King, is a true side-oat with decidedly long straw. It has yielded considerably less than Banner in a four-year test.

Alaska is an early-maturing variety which has given high yields in Eastern Canada, but is rather low in a four-year test at this Station.

Liberty and Laurel are two hulless sorts. Liberty has been grown at this Station since 1919. Laurel was introduced in 1924 and has yielded considerably higher than Liberty in a two-year average. Both varieties are very susceptible to smut, and should be treated with copper carbonate dust, as the ordinary formaldehyde impairs the germination of the seed.

Columbian (Ottawa 78) and Prolific (Ottawa 77) were introduced from the Central Experimental Farm in 1922. They were tested in 1922 and again this year and were low in yield both seasons.

O.A.C. No. 3 is a selection from Daubeney—an early variety. In 1923 it outyielded all other early maturing varieties, but this year it yielded the same as Alaska.

Cole (Sask. 795) is a selection made by the University of Saskatchewan. It is one of the earliest varieties grown. In a two-year average it has yielded on a par with Alaska.

Alaska, O.A.C. No. 3 and Cole have given satisfactory yields for early-maturing varieties. Extreme earliness and maximum yields in oats, however, do not seem to go together here. Hence where high yields are desired and the season is long enough, the standard sorts should be used.

SEEDING GRAIN ACCORDING TO WEIGHT AND SIZE OF KERNEL

An experiment has been conducted for the past two seasons in co-operation with the Industrial and Scientific Research Council of Canada.

The object of the experiment is to determine to what extent the rate of seeding should be governed by weight of seed per 1,000 kernels, percentage germination, and tendency to tiller, in the case of different varieties under test.

It becomes obvious, for such a project, that varieties differing in the above respects should be chosen. Following are the three varieties selected:—

1. Abundance.—A large seeded variety, possessing a low tendency to tiller.
2. Banner.—A variety with medium sized kernels and a medium tillering tendency.
3. Daubeney.—A variety characterized by small seeds and a high tendency to tiller.

It has been found by accurate weighing and counting of the seed used in 1925 that Abundance has approximately 421,000 kernels per bushel. Banner 500,000, while Daubeney had about 705,000. From these counts it will be apparent that a definite weight of oats might be used per acre in seeding two different varieties, while the number of seeds sown would vary greatly in each case.

The aim of the present experiment is to determine whether it is better to follow the usual procedure of seeding by weight regardless of the size of seed, or should the size of the seed be taken into account.

To secure accuracy this experiment consists of 1,728 separate seedings. The quantity of grain used to seed each plot is weighed and sown by hand.

Each variety has four different rates of seeding varying according to the variety used.

Abundance.—2½, 3½, 4 and 4½ bushels per acre (check, 3 bushels).
Banner.—2, 2½, 3½ and 4 bushels per acre (check, 3 bushels).
Daubeney.—1, 1½, 2½ and 3 bushels per acre (check, 2 bushels).

The different rates are replicated eight times and alternated with a check with each replication.

The experiment will be conducted for a period of not less than three years.*

BARLEY

Twelve varieties of barley were tested in duplicate during the past season. All varieties were seeded on May 6 at the rate of 2 bushels per acre, excepting hulless varieties, which were seeded at the rate of 1¾ bushels.

Following are tabulated the results:—

Barley—Test of Varieties or Strains
Sown on Summer-fallow May 6, 1925

Variety	Original source	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Yield of grain per acre	Weight per measured bushel after cleaning
				inch.		bush.	lb.
Trebi	Lacombe E.F.	Aug. 11	97	29	8·0	57·8	47·4
Bearer, O. 475	Ottawa	" 16	102	34	9·5	53·9	44·0
O.A.C. 21 (Sask. 228)	Sask	" 10	96	39	6·5	53·4	49·0
Hannchen, Sask. 229	"	" 14	100	32	9·0	52·9	53·9
*Himalayan, O. 59	Ottawa	" 3	89	26	9·0	47·7	61·9
O.A.C. 21	O.A.C., Guelph	" 10	96	38	6·0	47·5	49·0
Bark's Excelsior	Ottawa	" 15	101	29	9·0	47·0	....
Duckbill, O. 57	Ottawa	" 17	103	31	9·8	46·0	51·0
Swedish Chevalier	Lethbridge	" 15	101	30	9·0	46·0	50·0
Chinese, O. 60	Ottawa	" 10	96	38	8·0	45·5	50·0
*Junior, O. 471	"	" 1	87	25	9·0	44·6	61·8
Feeder, O. 561	"	" 1	87	33	9·5	30·4	47·9

*Hulless varieties.

Five of the varieties have been tested for a sufficient length of time to permit of a five-year average. A number of new varieties were introduced into the test in 1924 and in order to compare them from the standpoint of yield with some of the older varieties, a two-year average is given in the following table along with the five.

Barley—Two and Five-Year Averages

Variety	Original source	Yield of grain per acre	
		Two-year average	Five-year average
		bush.	bush.
Bark's Excelsior	Ottawa	28·6	34·5
*Himilayah, O. 59	"	28·7	32·6
O.A.C. 21	O.A.C., Guelph	26·0	31·8
Duckbill, O. 57	Ottawa	29·4	31·7
Chinese, O. 60	"	24·9	29·3
Trebi	Lacombe E.F.	35·3	....
Hannchen, (Sask. 229)	Saskatoon	34·3	....
Bearer, O. 475	Ottawa	32·1	....
*Junior, O. 471	"	28·7	....
O.A.C. 21 (Sask. 228)	Saskatoon	28·5	....
Feeder, O. 561	Ottawa	21·4	....

* Hulless varieties.

* This same experiment is being conducted at the Charlottetown Station, P.E.I., at the Cap Rouge Station, Quebec, at Macdonald College, Quebec, at the Central Farm, Ottawa, and at the Agricultural College, Edmonton, Alberta.

The season of 1925 proved a satisfactory one for barley. Most varieties grew rank enough to bring out any marked weakness of straw, yet in no case was lodging serious enough to check filling.

Trebi, a variety introduced a few years ago by D. Barks, Brooks, Alta., heads the list both this year and in the two-year average. This variety, however, is too short in the straw for dry areas and has a tendency to be weak when growth is rank.

Hannchen, a two-rowed sort received from the University of Saskatchewan in 1924, shows up well for the two years it has been tested. It was the highest-yielding barley in the dry season of 1924. It was produced originally at Svalöf, Sweden.

Bearer, a six-rowed sort introduced in 1924 from Ottawa, has given satisfactory yields. This variety grows tall, has long heads, and possesses reasonable strength of straw.

O.A.C. 21 (Sask. 228) is a selection from O.A.C. 21 made at the University of Saskatchewan. It has outyielded the original O.A.C. 21 slightly, in a two-year average Both it and the parent variety have proved particularly weak in the straw here.

Bark's Excelsior heads the list in a five-year average. It is a six-rowed sort, short-strawed, late-maturing variety with a short compact head.

Himalayan, an early-maturing hulless variety has given excellent yields. It stands second in the five-year average. It is short, however, and somewhat weak in the straw.

Duckbill, a good two-rowed sort, has good strength of straw and fair length. Ripens late and gives a good yield, but is usually inferior in yield here to the best six-rowed varieties.

PEAS

Six varieties of peas were tested in duplicate. All varieties were sown on summer-fallow land on May 8. Seedings were at the rate of from 1½ to 2½ bushels per acre, depending upon the size of the seed sown.

PEAS—TEST OF VARIETIES

Variety	Source	Date of ripening	Number of days maturing	Average length of vine	Average length of pod	Yield of grain per acre	
						1925	Two-year average
				inch.	inch.	bush.	bush.
Mackay, O. 25	Ottawa	Aug. 29	113	40	1·9	40·7	24·5
Arthur, O. 18	"	" 17	101	38	2·2	37·2	....
Cartier, O. 19	"	" 28	112	36	1·8	36·1	22·9
Chancellor, O. 26	"	" 12	96	44	1·8	35·4	18·7
Golden Vine, Sask. 257	Sask	" 15	99	38	1·9	35·1	....
Golden Vine, Sask. 625	Sask	" 14	98	40	1·9	34·7	18·4

A particularly good stand was secured this year in all varieties and heavier yields than usual were harvested. Arthur, Golden Vine and Chancellor have been grown since 1919, but owing to Arthur being impure in 1924 it cannot be used in an average with the two latter varieties. In a seven-year average Golden Vine has yielded 18.1 bushels per acre and Chancellor 16.4. Mackay and Carter are introductions from Ottawa in 1924 and are included in the two-year average. Golden Vine Sask. 257 is a selection made by the University of Saskatchewan and has been tested for the first time this year. Arthur and Golden Vine are two of the most commonly-grown varieties. Arthur has very coarse stems, medium-sized seed, is medium early in maturing, and gives a good yield. Golden Vine is a small-seeded variety, rather early maturing. It gives a fair yield and is less liable to split in threshing than some of the larger-seeded sorts. Mackay has given a high yield in a two-year test at this Station. It is a large-seeded variety having a dark-yellow pea with a black hilum (eye), but ripens rather late.

Cartier is a cross between Arthur and Mackay. It has medium-sized seed and has yielded well in a two-year test.

Chancellor is a small-seeded variety, decidedly early and gives a fair yield.

FLAX

Three varieties of flax were under test this year. They were seeded on May 19 at the rate of ½ bushel per acre. The varieties matured in good time and yields harvested were well above the average. Premost, the earliest variety, is slightly longer in the straw and is the least susceptible to disease. Crown is the most susceptible to disease. It was introduced in 1922 and as a result a four-year average is given so that it can be compared with the other varieties that have been grown for nine years. The yields are not high, and no variety seems to be outstanding over a period of years.

FLAX—TEST OF VARIETIES

Sown on Summer-fallow May 19, 1925

Variety	Source	Date of ripening	Number of days maturing	Average length of straw	Strenght of straw on a scale of 10 points	Yield per acre
				inch.		bush.
Premost	Steele Briggs	Aug. 29	102	20	10	17·8
Crown	Sask	Sept. 2	106	19	10	14·3
Novelty, O. 53	Ottawa	" 6	110	19	10	13·9

FLAX—FOUR AND NINE-YEAR AVERAGES

Variety	Source	Yield of grain per acre	
		Four-year average	Nine-year average
		bush.	bush.
Premost	Steele Briggs	10·2	9·2
Novelty, O. 53	Ottawa	9·5	8·9
Crown	Sask	9·8	....

WHEAT AND FLAX—COMBINATION CROP

An experiment has been carried on for the past three years to determine whether wheat and flax grown in combination would give yields of greater value, than where each is grown separately. Several seedings were made each year varying the proportions of wheat and flax sown. This is the first year that any flax has matured. In 1923 and 1924 the wheat gave about an average yield, while in no case did any of the flax sown in combination with wheat reach maturity. It is planned to continue this experiment next year. Following are tabulated the 1925 results:—

FLAX AND WHEAT—COMBINATION CROP

Sown on Summer-fallow May 19, 1925

Kind of grain	Rate sown		Height at harvest in inches		Yield of grain per acre	
	Wheat	Flax	Wheat	Flax	Wheat	Flax
	bush.	bush.			bush.	bush.
Wheat and flax	3/4	1/4	41·0	20·0	34·0	4·3
Wheat and flax	1	1/4	42·0	20·5	36·0	3·2
Wheat and flax	1/4	1/4	38·5	19·5	32·0	3·2
Wheat and flax	3/4	1/3	38·0	20·0	34·0	4·3
Wheat and flax	1/2	1/3	37·0	19·0	26·7	4·8

SPRING RYE AND EMMER

One variety of spring rye and one of emmer were tested in duplicate. The seed was sown on summer-fallow land on May 13. The following table gives the results obtained for 1925 and the average yield for a four-year period.

It will be noted that spring rye over a period of four years has given a yearly average of 503 pounds more grain per acre than emmer.

TESTS—SPRING RYE AND EMMER

Variety	Source	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Yield of grain per acre	
						1925	Four-year average
				inch.		bush.	bush.
Spring rye (Prolific)	Sask	Aug. 28	107	35	10·0	39·0	33·2
Early emmer	Ottawa 44	" 28	107	45	7·5	31·7	22·6

TESTS—FALL GRAINS

Two varieties of fall wheat and one of fall rye were sown in the fall of 1924. The plots were sown in duplicate on summer-fallow land.

The two varieties of fall wheat completely winter-killed. Only one plot of Dakold fall rye came through in fair condition and yielded at the rate of 26.8 bushels per acre, while the duplicate plot was over 80 per cent winter-killed. The plot which came through the winter in such good condition was located on the leaward of a grass field and hence was covered with snow during the winter months.

The experimental work in cereals is supervised by Mr. F. M. MacIsaac, B.S.A. Mr. MacIsaac is also in charge of the forage crop investigational work carried on at this Station.

FORAGE CROPS

The season of 1925 was moderately favourable for the production of forage crops. The moisture in the early spring was sufficient to insure good germination in all spring-sown crops and to give perennials and biennials a good start, while the rains in June and July assured continued growth throughout the growing season. Cutworms were quite serious and worked on all roots, sunflowers and sweet clover.

Information on the various kinds of forage crops adapted to prairie conditions is fast becoming a subject of vast importance to the farmers of Western Canada. This is due chiefly to the trend of agriculture at present toward a more diversified system of farming. Soil drifting, weeds and increase of livestock are some of the factors responsible for such a change.

The experimental work carried on under this division consists chiefly in testing for yield, hardiness and drought-resistance such varieties or strains as show possibilities of becoming successful under northwestern Saskatchewan conditions.

Due to various kinds of forage crops differing so widely in percentage of moisture, when stored for feed, it is necessary to have a constant basis for comparison. The percentage of dry matter is used for this purpose. In order that the reader may be able to determine more intelligently the merits of each variety and compare the different classes of crops, the dry-matter yields are quoted. The results of the various experiments are presented in tabular form, and when the work under test has been in operation for several years, deductions are drawn.

CORN

Twenty-two varieties or strains of corn were tested on summer-fallow land during the past season. The seed was sown with a grain-drill set at a rate of 2½ bushels of wheat per acre. The rows were three feet apart and the plants thinned to 12 inches apart in the row. The seed was sown on May 21 and May 30, and the crop harvested on September 14.

CORN—TEST OF VARIETIES FOR ENSILAGE

Variety	Source	Average height of plants	Maturity at harvest	1925 yields Green weight	1925 yields Dry weight
		inch.		tons	tons
Yellow Dent	A. J. Whimple	55	Early Tassel	10·11	1·41
Wisconsin No. 7	J. Parks	58	Tassel	10·00	1·20
Barr Leaming	G. S. Carter	38	Early Tassel	9·84	1·21
Northwestern Dent	Brandon	56	Early Silk	8·86	1·24
Amber Flint	A. J. Whimple	54	Early Silk	8·67	1·20
Disco 90-Day White Dent	Dak. Imp. Seed Co.	54	Cob just forming	8·54	1·23
White Cap Yellow Dent	Steele Briggs	56	Tassel	8·54	1·20
North Dakota	Steele Briggs	56	Late Tassel	8·48	1·16
Northwestern Dent (Dak. grown)	A. E. McKenzie	53	Early Tassel	8·46	1·09
Northwestern Dent (Neb. grown)	A. E. McKenzie	55	Cobs just forming	8·33	1·33
Leaming	J. Parks	53	Fully silked	7·66	1·01
Hybrid	A. J. Whimple	56	Tassel	7·29	1·11
Quebec 28	J. L. Todd McDonald College	60	Early Silk	7·26	1·03
Alta	Dak. Imp. Seed Co.	51	Cobs just forming	5·75	0·72
Longfellow	Dak. Imp. Seed Co.	45	Late Tassel	5·63	0·77
Comptons Early	J. O. Duke	48	Early Silk	5·20	0·66
Northwestern Dent	Dak. Imp. Seed Co.	47	Late Tassel	5·18	0·60
Leaming	J. O. Duke	45	Tassel	3·84	0·54
Golden Glow	J. O. Duke	42	Late Tassel	3·79	0·48
Bailey	J. O. Duke	47	Cobs just forming	3·68	0·50
Wisconsin No. 7	J. O. Duke	43	Late Tassel	3·33	0·40
Longfellow	J. O. Duke	42	Late Tassel	2·83	0·33

It will be noted from the table that the last nine varieties listed—Alta to Longfellow inclusive—are considerably lower in yield than the first thirteen. The lower yield of these varieties is attributed to the fact that they arrived after the other varieties were seeded. In order to give an idea of what yield of corn may be expected from year to year a three-year average is presented in the following table:—

CORN—THREE-YEAR AVERAGE, 1923-25

Variety	Source	Average yield per acre green weight
		tons
Wisconsin No. 7	J. Parks	7·65
Northwestern Dent	Brandon	7·61
" "	McKenzie	7·06
White Cap Yellow Dent	Steele Briggs	7·00
Leaming	Parks	6·87
North Dakota	Steele Briggs	6·72
Quebec 28	McDonald College	6·23

In places where extensive tests with corn have been carried on, one of the outstanding results developed is the adaptability of different varieties and strains to different districts. By continued selection corn is being moved further north each year.

In northwestern Saskatchewan the cool seasons have been the limiting factor in its growth. As will be noted from the yields they are low when compared with those appearing in the table under the heading of sunflowers. Corn has two advantages over sunflowers. Ton for ton in the same stage of maturity corn has given much better results in feeding experiments. A limited amount of it may be grown which can be either pastured off or fed as fodder without the use of a silo, whereas in the case of sunflowers ensiling is necessary, except when used as a soiling crop.

The present yields and the comparative value of this crop for ensilage purposes are sufficient inducement to warrant further testing and selection from different varieties with a view of obtaining a corn better adapted to conditions in northwestern Saskatchewan.

SUNFLOWERS

Ten varieties of sunflowers were tested in 1925. The seed was sown by hand in rows three feet apart with the plants averaging 12 inches apart in the row. All varieties were seeded on May 16 in triplicate plots. The yields presented in the following table are the average from triplicate tests.

SUNFLOWERS—TEST OF VARIETIES

Variety	Source	Average height of crop in inches	Stage of maturity at harvest	Yield per acre green weight	Per cent dry matter	Yield per acre dry matter
				tons		tons
Manteca	C.P.R.	60	87% in bloom	17·02	14·06	2·39
Manchurian	C.P.R.	57	99% in bloom	15·42	16·21	2·50
Russian Giant	Dak. Imp. Seed Co.	68	Heads just formed	15·22	18·94	2·88
Mammoth Russian	C.P.R.	58	88% in bloom	14·52	16·21	2·35
Black	C.P.R.	56	94% in bloom	13·45	14·57	1·96
Mammoth Russian	K. McDonald	63	Beginning to bloom	12·87	18·05	2·32
Mixed	C.P.R.	55	97% in bloom	12·77	16·02	2·05
Manchurian	A. E. McKenzie	56	100% in bloom	12·40	16·76	2·08
Ottawa 76	C.E.F.	65	95% in bloom	10·07	15·70	1·58
Mennonite	Rosthern	47	100% in bloom	10·05	17·62	1·77

All varieties tested have reached over 75 per cent in bloom, which appears to be sufficiently far advanced to make good ensilage. It is evident that the yields from this crop are much in advance of corn. As will be noted from the table, there is considerable variation in the yield of dry matter per acre.

In the Manchurian strain from McKenzie's there was considerable multi-branching. In Mennonite and Mammoth Russian (C.P.R.) multibranching appeared to a lesser extent. Mennonite is the only variety which ripened seed, but it has given the lowest yield.

FIELD ROOTS

A total of seventy-one varieties of field-roots were tested this year. All varieties were sown during the last week in May. The seeding was done with the ordinary grain-drill in rows thirty-six inches apart. Owing to the presence of wireworms and cutworms in the land used for roots, the mangels and sugar beets were eaten off to about a fifty per cent stand. In the case of the fall turnips, swedes and carrots, the damage caused was practically nil. The carrots were thinned five to six inches apart in the rows and other roots twelve inches. Several cultivations were given during the growing season. All roots were harvested during the last week in September, when notes were taken on the type, purity and quality of the varieties tested. Moisture and dry-matter determinations were also made at this time.

The mangels are classified according to size and shape of the root, into five different types—long, half-long, intermediate, tankard and globe. At the time of harvest, measurements were taken from four to six roots representative of each variety. The result of the measurements determines to which type the variety belongs. The percentage of any type quoted denotes the purity of that variety. On account of the damage to some of the plots by cutworms, the yields from each variety were taken from such plots measuring one-thousandth of an acre having a hundred per cent stand. This was done to make results more comparable. The yields presented in the accompanying tables are the average of duplicate plots.

Swedes—Test of Varieties for Yield and Purity

Name of Variety	Green weight per acre	Per cent moisture	Dry weight per acre	Remarks
	tons		tons	
Improved Yellow Swedish (Gen. S. Co.)	17·75	88·63	2·02	Size medium to large, rather rooty.
Kangaroo (McKenzie)	16·25	87·73	2·00	Medium-sized. Uniform, fairly smooth.
Ditmars (McNutt)	15·50	87·77	1·42	Rather small. Free from roots.
Bangholm (McKenzie)	14·50	87·37	1·82	Uniform, smooth and rather large.
Bangholm (Gen. S. Co.)	14·00	87·15	1·79	Size medium. Smooth, fairly uniform.
Northwestern (McKenzie)	14·00	86·80	1·84	Size medium. Free from roots.
Purple Top (H. McFayden)	13·50	88·16	1·59	Medium size. Fairly smooth.
Olsgaard Bangholm (H.H.)	13·50	87·62	1·67	Medium size. Fairly smooth.
Monarch (McKenzie)	13·25	88·32	1·54	Medium size. Fairly uniform.
Bangholm (Ewing)	13·25	87·62	1·64	Medium size. Uniform, somewhat rooty.
Superlative (McKenzie)	12·75	88·95	1·40	Medium size. Somewhat rooty.
Bangholm Club-Root-Resistant, Charlottetown	12·25	85·86	1·73	Medium size. Smooth and uniform.
New Century (Rennie Seed Co.)	11·75	87·46	1·47	Fair size, smooth and uniform.
Shepards Golden Globe (H.H.)	10·75	87·27	1·36	Size medium, many roots. Poor shape.

FALL TURNIPS—TEST OF VARIETIES FOR YIELD AND PURITY

Name of Variety	Green weight per acre	Per cent moisture	Dry weight per acre	Remarks
	tons		tons	
Red Paragon (Sutton & Sons)..	17·00	90·86	1·55	Smooth. Uniform and rather large.
Early Six Weeks (Sutton & Sons).	16·00	90·78	1·47	Large. Smooth. Fairly uniform.
Purpletop Mammoth (Sutton & Sons)........................	14·25	90·82	1·31	Fairly large. Smooth. Good shape.
Purpletop Mammoth (Steele Briggs (S. 774-25..............	13·75	90·94	1·25	Fairly uniform. Rather small. Rooty.
Purpletop Aberdeen (Sutton. & Sons)........................	13·00	90·47	1·24	Size medium. Somewhat rooty.
Devonshire Greystone (S.B.)....	12·25	90·55	1·16	Size medium. Smooth. Uniform.
Greentop Yel. Aberdeen (Ewing)	12·25	89·14	1·33	Medium size. Fairly uniform.
Pomerian White Globe (S.B.)....	12·00	90·47	1·14	Fairly large. Uniform and smooth.
Fynsk (H.H.)..................	11·50	86·72	1·53	Size medium. Fairly long. Smooth.
White Globe (Ewing)............	11·25	90·55	1·06	Medium size. Rather rooty.
Hardy Green Round (Sutton & Sons)........................	11·00	89·45	1·16	Medium size. Fairly smooth.
Aberdeen Yellow Purpletop (S. B.)............................	9·50	89·02	1·04	Size medium. Uniform. Smooth.

MANGELS—TEST OF VARIETIES FOR YIELD AND PURITY

Name of Variety	Green weight per acre	Per cent moisture	Dry weight per acre	Remarks
	tons		tons	
Taarojc Barres (H.H.)............	18·75	89·10	2·04	82% half long. Roots smooth.
Eckendorffer Red (H.H.)..........	17·50	88·98	1·93	76% intermediate. Roots smooth.
Giant Yellow Intermediate (H.H.)	15·50	85·23	2·29	80% intermediate. Prongy.
Elvetham Mammoth (H.H.)......	15·50	86·02	2·16	85% half long. Somewhat rough.
White Green Top Half Sugar (H. H.)............................	14·75	87·73	1·81	85% intermediate. Roots smooth.
Fjerritslev Barres (H.H.)..........	14·00	86·84	1·84	90% intermediate. Roots smooth.
Rosted Barres (H.H.)............	13·75	87·34	1·74	85% intermediate. Fairly smooth.
Eckendorffer Yellow (H.H.)......	12·75	88·40	1·48	80% intermediate smooth.
White Red Top Half Sugar........	12·50	88·09	1·49	85% half long. Fairly smooth.
Svalof Original Alta (Gen. S. Co.).	12·0	89·02	1·32	85% intermediate. Somewhat rooty.
Barres Oval (Gen. S. Co.).........	11·75	87·77	1·44	95% intermediate. Roots smooth.
Stryno Barres (H.H.)............	11·25	85·74	1·60	80% intermediate. Fairly smooth.
Svalof Original Rubra (Gen. S. Co.)	10·50	88·91	1·16	85% intermediate. Rooty.
Peerless (McKenzie)..............	10·0	85·90	1·41	90% intermediate. Fairly smooth.
Manitoba Giant Yellow (McKenzie)............................	9·75	86·80	1·29	80% intermediate. Fairly smooth.
Long Red (H. and McF.)..........	13·0	84·10	2·07	78% long. Rather rooty.
Giant Long Red (McKenzie).......	11·0	86·37	1·46	85% long. Fairly smooth.
Yellow Eckendorffer..............	9·50	86·17	1·30	90% tankard. Fairly smooth.
Giant Yellow Globe (McKenzie)..	9·0	87·50	1·13	84% globe. Roots smooth.
Danish Sludstrup (Ewing).........	8·50	85·20	1·26	75% half long. Fairly smooth.
Red Half Sugar (H. and McF.)....	8·25	86·60	1·11	80% half long. Clean and smooth.
Golden Tankard (Ewing)..........	7·25	86·02	1·01	87% intermediate. Clean and smooth.
Yellow Leviathan (S.B.)..........	6·50	83·16	1·09	80% tankard. 20% prongy.
Yellow intermediate (C.E.F.)......	6·25	82·66	1·08	75% half long. Somewhat rooty.
Barres Half Long (Gen. S. Co.)....	6·0	86·06	0·84	85% intermediate. Fairly smooth.
Red Eckendorffer (Gen. S. Co.) ...	12·50	87·97	1·50	75% intermediate. Roots smooth.

The yields obtained this year, as will be noted, from the tables show considerable variation, both in green and dry weights. Some of the varieties were surprisingly low in yield, while others were fairly high.

Swedes and fall turnips have been tested for a period of fourteen years. Of the different kinds of roots tested these two classes have given the most satisfactory returns. Germination takes place about two weeks after seeding, and in most cases good stands were secured. Unless attacked by disease or insects, fairly good yields may be expected each year.

Mangels have been under test since 1912 and have proven an undependable crop, germination being generally poor, followed by an uneven stand and low yield.

Sugar beets have given similar results to mangels. The yields have been low and the crop uncertain. This year the sugar beets were eaten off to such an extent by cutworms that the yields of the different varieties were not comparable, hence are not included in this report.

Carrots have been a difficult crop to grow at this Station, owing to damage by rabbits. Fairly good stands have been secured each year, but were eaten off as soon as the plants reached a height of three to four inches. The rabbits continued to nibble the carrots during the summer. Since 1920 no carrots have been harvested and it is questionable whether carrots are worth while growing where rabbits are numerous, unless the land is fenced with chicken netting.

There are but few field-roots grown in northwestern Saskatchewan. The unpopularity of this crop is probably due to labour requirements. In early summer and busy autumn when labour demand is at its peak, few farmers are in a position to handle roots. Storage space safe from frost can be found only on few farms and for this reason silage is growing in popularity.

Except for fattening lambs, little experimental feeding work with roots has been done at this Station. In the lamb-feeding experiments when turnips were fed as a supplement to the ration the results showed that turnips improved the ration of grain and oat straw and reduced the cost per pound gain. When sunflower silage was compared with turnips for fattening lambs, the results were in favour of the silage.

ANNUAL HAY CROPS

The need for annual hay crops is demanding more attention by farmers each year. The increase in the dairy industry in the last few years calls for the use of a suitable forage during the whole of the year. The fact that clovers and perennial grasses require two years before any returns are available and are an uncertain crop in very dry areas still further enhances the need for a suitable annual hay crop.

The different kinds of experiment conducted under this heading include tests with different kinds of annual crops, varieties of oats cut in different stages of maturity, varieties of peas, oats and peas in combination, and varieties of oats seeded at different dates.

All plots are harvested as nearly as possible at the same stage of maturity in order to make results more comparable.

Owing to the wide variations in the moisture-content of the various crops, moisture-determinations of each crop are made at the time of cutting, thus making possible a direct comparison of the different crops on a basis of dry matter.

KINDS OF ANNUAL HAY CROPS

Seven different annual hay crops were tested during the past season. All varieties were sown on May 30 on summer-fallow land. The yields presented in the following table are the averages from duplicate plots together with a two-year average:—

ANNUAL HAY CROPS

Crop	Yield green weight per acre	Per cent of moisture	Yield dry matter per acre	Two-year average	
				Green weight per acre	Dry weight per acre
	tons		tons	tons	tons
Oats	6·77	63·09	2·50	5·91	2·06
Oats and peas	5·82	62·60	2·18	5·37	1·80
Hungarian millet	5·83	69·73	1·76	4·06	1·30
Siberian	5·32	69·24	1·64	....	....
Spring rye (prolific)	4·42	62·21	1·67	4·10	1·54
Hubam (sweet clover)	4·09	79·69	0·83	3·46	0·80
Sudan grass	2·51	75·98	0·60	1·40	0·36

Oats continue to be the most suitable annual hay crop. When seeded in the ordinary manner and cut in the late-milk to early-dough stage, hay is of excellent quality and palatability. In point of yield oats have excelled all other crops tested during the last two years and have been a consistently high yielder over a period of years.

A mixture of peas with oats improves the quality of the hay, but due to the high cost of peas, increases the cost of growing the crop. In a seven-year average at this Station, 1917-23 inclusive, a combination of peas and oats has slightly outyielded oats alone. This combination is, however, a littlè more difficult to harvest than oats alone and in years of unfavourabe weather conditions does not cure quite so easily.

Millets are a short-season crop and require ample moisture and warmth for maximum yields. The hay is of fair quality though less desirable than oats. Fair yields are produced each year.

Sudan grass, like the millets, is a native of a much warmer climate than ours and for that reason requires considerable heat and moisture for best results. It should not be sown in the spring until conditions are favourable for quick germination and growth. Due to its coarseness it does not make as palatable a hay as oats. Owing chiefly to the cool seasons of northwestern Saskatchewan, it has been a low yielder and an uncertain crop.

Sowing rye as an annual hay crop commends itself to the attention of the farmers chiefly because of its earliness. It gives a fair yield and does well on poor soils. It is inferior in point of yield to oats and due to the dry ligneous character of its growth it is less palatable than oats for live-stock.

Hubam sweet clover as an annual hay crop has given fair returns. It grows rather slowly in the early part of the season, hence is at a disadvantage on weedy land. During the latter part of the season it produces a quick rank growth. It should be sown fairly thick and cut just before coming into bloom for best results.

VARIETIES OF OATS FOR HAY

Oats are the most commonly used of the cereals for hay-production. As a result of their popularity and due also to the fact that they are cut for feed in the sheaf, from the time they are quite green until nearly ripe, an experiment was conducted to determine the best stage of maturity to cut oats for hay and to ascertain the highest-yielding variety. In order that this experiment may be of further value, chemical analyses are under way to determine the food value of each variety when cut in different stages of maturity.

Nine varieties of oats were tested this year. Each variety was sown on summer-fallow land. The yields presented in the subjoined table are the average of duplicate plots.

VARIETIES OF OATS FOR HAY CUT IN DIFFERENT STAGES OF MATURITY

Variety	Yield per acre green weight			
	Cut in bloom stage	Cut in late-milk to early-dough stage	Cut when ripe	Aftermath from first cutting
	tons	tons	tons	tons
Gold Rain	7·44	6·84	3·81	1·04
Longfellow	7·02	6·36	2·94	1·23
Liberty	6·96	6·03	4·35	1·32
Leader	6·81	4·71	3·24	1·38
Columbian	6·81	4·80	3·78	1·14
Victory	6·63	4·80	3·78	0·72
Banner	6·54	4·68	3·63	1·26
Daubeney	4·92	5·76	3·36	0·90
Alaska	4·71	5·07	3·21	1·62

In case any variety may be affected by several conditions, this experiment will be continued for several years before conclusions are drawn. Furthermore, chemical analyses were not available at the time of preparation of this report and these may have a direct bearing on the deductions.

VARIETIES OF PEAS FOR HAY

Four varieties of field peas were sown on summer-fallow land on May 31. The seed was sown at the rate of one and a half bushels per acre, depending upon the size of the seed used. All varieties were cut as soon as most of the plot had reached the pod stage. Moisture and dry matter determinations were made from each variety.

Following are tabulated the results obtained:—

VARIETIES OF PEAS FOR HAY

Variety	Average length of vine	Average yield per acre green weight
	inch.	tons
Arthur O. 18	37	8·00
Golden Vine Sask. 625	37	7·10
Solo	41	7·00
Chancellor O. 26	36	6·70

Arthur has given the highest green weight yield, with Chancellor lowest. The former is a medium-late-maturing variety and the latter an early variety. Moisture and dry-matter determinations were not available at the time of preparation of this report.

VARIETIES OF PEAS WITH OATS

The object of the test is to make a comparison of the following mixtures for hay, namely Chancellor peas and Banner oats, and Mackay peas and Banner oats. The size of the pea is taken into consideration in determining the amount of each variety to seed. Mackay is later maturing and a heavier yielder than Chancellor and will probably prove more useful in a hay mixture. The plots were cut when the oats were in the early dough stage.

VARIETIES OF PEAS WITH OATS FOR HAY

—	Proportions of Mixture		Yield per acre, 1925	
	Oats	Peas	Green weight	Dry matter
	lb.	lb.	tons	tons
Banner oats and Mackay peas	34	30	7·60	2·87
" " Chancellor peas	34	22½	6·65	2·66

DATES OF SEEDING BANNER OATS FOR HAY

Since oats for hay are not usually sown until after the rush of spring work, an experiment was conducted to determine just how late oats could be sown with expectation of a reasonable crop. Five seedings were made at intervals of ten days each. The plots were harvested as near as possible at the same stage of maturity. Moisture and dry-matter determinations were made at time of cutting. Following are tabulated the results obtained:—

DATES OF SEEDING OATS FOR HAY

Crop	Date of sowing	Date of cutting	Stage of maturity when cut	Per cent moisture at time of cutting	Yield per acre	
					Green weight	Dry matter
					tons	tons
Banner Oats	May 28	Aug. 24	Early dough	54·20	2·80	1·28
"	June 7	" 31	"	55·86	3·20	1·41
"	" 17	Sept. 22	"	52·15	3·70	1·77
"	" 27	"	Early milk.	68·85	5·40	1·68
"	July 7	"	Bloom	74·51	5·60	1·43

Considering the yield of dry matter the seeding on June 17 has given the best results. The two last seedings although high in green-weight yield are low in dry matter due to their high percentage of moisture. Furthermore, the food value of the last two plots is not equal pound for pound in dry matter to those which have reached the early-dough stage.

This experiment has been in operation for four years and results so far indicate that oats sown after June 20 are not likely to reach the early-dough stage before being damaged by frost.

PERENNIAL AND BIENNIAL HAY CROPS

Western rye grass, brome grass, sweet clover and alfalfa may be classed among the important permanent forage crops adapted to Western Canada conditions. The yields of the respective crops together with a combination of western rye and brome grass are presented in the following table.

PERENNIAL AND BIENNIAL HAY CROPS

Crop	Yield per acre			
	Yield, green weight 1924	Yield, dry weight 1924	Yield, green weight 1925	Yield, dry weight 1925
	tons	tons	tons	tons
Western rye grass	4·68	4·63	5·20	2·20
Brome grass	4·08	2·24	5·64	2·31
Western rye grass and brome grass	4·48	1·39	4·88	2·04
Sweet clover	5·16	0·96	....	....
Alfalfa	5·86	2·35	....	....

It will be noted that western rye grass alone, has outyielded a combination of western rye grass and brome grass in the dry season of 1924. Under the more favourable conditions of 1925 brome grass has outyielded western rye grass alone and a combination of both grasses.

Rye grasses is favoured in the district for the reason of its ease of eradication. Brome, on the other hand, is not used to any great extent on account of its spreading underground root-system which makes it most difficult to eradicate.

The winter of 1924-25 was particularly severe on legume crops. In the case of sweet clover, the Arctic variety and two seedings of common sweet clover with nurse-crops were the only plots that came through the winter. Other varieties and strains tested winter-killed. Several seedings of alfalfa were made varying the rates of seeding and the distance of rows apart. All plots completely winter-killed. The winter-killing was no doubt partly due to the weak condition of the plants as a result of the extreme drought of the dry season of 1924. The plants were small and the root-system poorly developed. The plots that survived the winter varied in stand from thirty-five per cent to ninety per cent. Due to uneven stands the plots were allowed to go to seed. It is noteworthy that the only plots of common sweet clover to survive the winter were those sown with a nurse-crop.

MIXTURES OF WESTERN RYE GRASS AND SWEET CLOVER

Western rye grass and sweet clover have given satisfactory results at this Station when grown in combination. The use of sweet clover with western rye grass is recognized as good procedure. It has a very beneficial effect on the soil. The fact that sweet clover is rich in protein aids the farmer in providing a balanced ration for his stock. When mixed with western rye grass, it is more easily cured than when grown alone. Under favourable conditions where the crop, is cut early in the season, there is a good aftermath principally of sweet clover. No sweet clover appears in the second crop, except in cases where the seed failed to germinate in the first year.

Considerable attention has been given to ascertain the best proportions of western rye grass and sweet clover to use. The percentage of sweet clover in the mixture should be high enough to secure as heavy a crop as possible in the first year, and at the same time have sufficient rye grass in order that there will be a good stand after the sweet clover has died out. Just what combination should be used is the object of the experiment. The various mixtures tried are shown in the following tables.

Western Rye Grass and Sweet Clover Sown 1924

Mixture	Yield per acre	
	Yield green weight 1925	Yield dry weight 1925
	tons	tons
Western rye 8 lb. Sweet clover 4 lb.	4·88	1·66
Western rye 8 lb. Sweet clover 6 lb.	5·40	1·60
Western rye 8 lb. Sweet clover 8 lb.	5·56	1·85
Western rye 8 lb. Sweet clover 10 lb.	5·60	1·80
Western rye 8 lb. Sweet clover 12 lb.	5·44	1·76
Western rye 4 lb. Sweet clover 8 lb.	5·04	1·52
Western rye 6 lb. Sweet clover 8 lb.	4·94	1·49
Western rye 10 lb. Sweet clover 8 lb.	5·14	1·55

Western Rye Grass and Sweet Clover Sown 1923

Mixture	Yield per acre					
	Green weight 1924	Dry weight 1924	Green weight 1925	Dry weight 1925	Two-year average	
					Green weight	Dry weight
Western rye 8 lb. Sweet clover 4 lb.	2·68	....	4·72	2·02	3·70	....
Western rye 8 lb. Sweet clover 6 lb.	2·52	....	4·70	1·90	3·61	....
Western rye 8 lb. Sweet clover 8 lb.	2·68	....	5·00	2·09	3·84	....
Western rye 8 lb. Sweet clover 10 lb.	2·82	....	5·04	2·60	3·93	....
Western rye 8 lb. Sweet clover 12 lb.	2·32	....	4·32	2·51	3·32	....
Western rye 4 lb. Sweet clover 8 lb.	1·70	0·93	3·24	1·30	2·47	1·11
Western rye 6 lb. Sweet clover 8 lb.	1·72	1·01	3·24	1·33	2·48	1·17
Western rye 10 lb. Sweet clover 8 lb.	1·64	0·91	3·14	1·29	2·39	1·10

Dry-matter determinations are made at Swift Current. Unfortunately a number of the 1924 samples were damaged in transit, hence the table is not complete.

As will be noted from the tables, the mixture of eight pounds of western rye and ten pounds of sweet clover has in every case given the highest yield.

STRAINS—WESTERN RYE GRASS

Western rye grass ranks high among the important grasses adapted to prairie conditions. It is a native of North America, and grows naturally on the prairie, hence is a grass which adapts itself to different climatic conditions as well as a wide range of soils. It is preferably a hay grass and produces good yields under favourable conditions but on dry or sandy soils the yields are usually lower. The fact that it is normally self-fertilized makes possible the establishment of strains which become fairly well fixed as to type. Considerable attention is therefore given to investigational work with this forage crop.

In 1922, an even stand of western rye grass was secured and the strains seeded that year still continue to yield good crops of hay. On the other hand, the portion of the plots left each year for seed have to some extent died out.

In 1924, a poor stand of western rye grass was secured. Of the eight strains sown, one completely winter-killed. In the others the stand ranged from sixty to ninety per cent.

Thirty-one strains were tested this year in rows thirty-six inches apart. One-half of each plot was cut for hay, while the remainder was left for seed. By this method each strain is tested for seed-production as well as hay. Observations and notes made at the time of harvest, show a marked difference in habit of growth, percentage of leaf, colour of foliage, and quality in the different strains under test. As far as space permits, a short description appears opposite each strain. In the tables which follow, the results of some of the most promising strains are given.

WESTERN RYE—TEST OF STRAINS FOR YIELD AND PURITY
1922 Seeding

Strains	Yield per acre			Remarks
	Green weight	Dry weight	Seed	
	tons	tons	lb.	
Strain No. 4	3·75	1·78	320	Fairly spreading and leafy. Colour greyish-green. Heads long.
Strain No. 10	3·21	1·55	462	Plant upright and leafy. Colour greyish-green. Good heads.
Strain No. 11	3·11	1·55	213	Fairly upright. Medium leafy. Foliage light-green colour.
Strain No. 91	2·98	1·46	191	Plants erect. Fairly leafy. Heads rather short.
Strain No. 81	2·95	1·41	142	Plants erect. Fairly leafy. Colour greyish-green. Heads fair length.
Strain No. 89	2·95	1·47	266	Plants erect. Rather leafy. Heads of fair length.
Strain Whiting	2·91	1·35	266	Plants erect. Medium leafy. Heads fair length.
Strain No. 15	2·84	1·51	213	Plants upright and leafy. Colour light-green.
Strain No. 5	2·73	1·35	231	Plants erect and leafy. Large heads. Colour pale or greyish-green.
Strain No. 98	2·70	1·37	320	Plants somewhat spreading. Colour light-green. Heads medium.
Strain No. 19	2·56	1·30	213	Plants upright. Fairly leafy. Colour light-green.
Strain No. 93	2·56	1·24	213	Plants erect. Heads medium length. Colour light-green.

WESTERN RYE—TEST OF STRAINS FOR YIELD AND PURITY
1924 Seeding

Strains	Per cent stand	Yield per acre			Remarks
		Green weight	Dry weight	Seed	
		tons	tons	lb.	
Strain No. 15	90	3·83	1·60	790	Plants erect and leafy. Colour light-green. Heads long.
Strain No. 17	88	3·24	1·38	589	Plants upright. Fairly leafy. Colour medium-green. Heads fair length.
Strain No. 5	80	3·13	1·31	667	Plants fairly erect. Leafy. Colour pale or greyish-green. Heads long.
Strain No. 92	75	2·71	1·23	558	Plants slightly spreading. Colour dark-green tinge. Heads long.
Strain No. 81	70	2·19	0·94	480	Plants upright. Fairly leafy. Colour greyish-green. Heads long.
Strain No. 83	70	2·00	0·94	388	Stems upright and leafy. Colour light to medium-green. Heads fair length.
Strain No. 31	60	1·55	0·65	233	Stems upright. Fairly leafy. Colour dark-grsen-grey tinge.

POULTRY

The only breed of poultry kept at this Station is the Barred Plymouth Rocks. All laying birds are trap-nested and records of egg-production are tabulated for each bird. A portion of the flock has been pedigreed by maintaining the identity of the eggs throughout the hatching period. Each chick was hatched separately in a partitioned wire basket and wing-banded before being allowed to mix. By trap-nesting the eggs from high-producing stock were used and the less productive females were disposed of for table purposes. All cockerels were sold each season but the supply was seldom sufficient to meet the demand.

In addition to hatching, brooding and rearing of chicks, problems in housing and feeding have received special attention at this Station.

The poultry yards have recently been divided with the intention of growing a crop on half the land each year. When fresh ground is available there is less danger of the flock becoming infested with intestinal parasites.

EGG-PRESERVATION

The object of this experiment was to determine the most satisfactory method of preserving summer eggs for winter use. Some of the preservatives tried to date are, water-glass, lime-water, dry salt, bran, covering with lard, wrapping in paper and dipping in boiling water ten and fifteen seconds. Packing in crates and turning once every ten days, was also tried. In each case the eggs were stored in a cool dry basement where the temperature was kept fairly even.

The most dependable method thus far tested has been the packing in a commercial water-glass solution following the instructions on the container. Lime-water gives good satisfaction, if a good quality of lime is procured, but as the quality varies considerably the inferior quality may easily be mistaken for good lime and very unsatisfactory results may follow. The dipping in boiling water is another method worthy of recognition. Ten seconds seems to be more advisable than fifteen as the eggs dipped fifteen were streaked with cooked portions of the white. Eggs packed after dipping in boiling water at this Station have always had the crate turned over every ten days, which tends to keep the yolk from settling to the bottom of the shell and adhering to it. This plan is especially desirable when eggs are packed in cases in cold storage without any treatment.

Important points to keep in mind when storing eggs:—

1. To remove the male birds from the flock as soon as hatching is complete, as only unfertilized eggs should be used for storage.
2. The eggs should be clean by keeping the nests clean and should not be washed before packing.
3. The eggs should be collected daily and, when possible, packed on the same day.

COMMERCIAL COLD STORAGE

During June, July and August, 1924, when eggs were only worth 20 cents per dozen, 180 dozen were shipped by express in 30-dozen crates to a cold storage plant at Saskatoon. Thes eggs were sold to the Hudson's Bay Company at Saskatoon on January 16, 1925, for 45 cents per dozen. After deducting expenses of shipping, storing and handling, a net profit of 17 cents per dozen was realized as compared with selling at Scott at time of storing.

CORN VERSUS NO CORN IN THE RATION FOR LAYING PULLETS

An experiment was conducted from the first of November, 1924, to the end of April, 1925, to determine the necessity of corn in the ration for laying pullets.

Forty-eight pullets were divided into two lots of twenty-four each. Both lots were fed the same ration excepting that one lot received 20 per cent corn, both in scratch grain and mash.

The mash for the lot getting no corn was composed of equal parts bran, shorts, oat-chop, barley-chop, and beef-scrap. The lot getting corn received the same mash with the addition of one part of corn meal. The scratch-grain fed to the "no corn" lot was composed of two parts wheat, one part oats and one part barley. One part cracked corn was included in the scratch-grain fed to the corn-fed lot.

The net value of the eggs is the determining factor in profit or loss. The variation in value was from 17.5 cents to 45 cents per dozen, depending upon the time the eggs were available for sale.

The use of corn in this experiment increased the egg production sufficiently to more than pay for the corn. The difference in profit over feed cost was $1.26 in favour of the pen which received corn, and the cost of feed per dozen eggs laid was 1.3 cents per dozen less than in the check lot. A similar experiment conducted the year previous indicated that the corn was not a profitable feed. Therefore, the results from two years necessitate further investigation.

HULLESS VERSUS COMMON OATS FOR LAYING PULLETS

The object of this experiment was to determine the value of feeding hulless oats as compared with common oats in the ration for laying pullets.

Fifty pullets were divided into two lots of 25 each. The same ration was used in each lot except that one lot received hulless and the other common oats in the scratch-grain and mash.

The mash consisted of four parts oat-chop and one part beef-scrap, and the scratch-grain was two parts wheat, one part oats and one part barley.

The hulless oats increased the egg-production and decreased the cost of producing eggs by 8½ cents per dozen. The test of the previous year showed only 3.4 cents per dozen eggs in favour of the hulless oats.

BEES

Bee-keeping in northwestern Saskatchewan has not been undertaken to any great extent. The lack of interest has been the result of alfalfa being a very undependable crop, and the open prairie not affording sufficient nectar for bees. Sweet clover is rapidly being recognized as a valuable forage crop for hay and pasture purposes and on account of its value as a honey-producer, it will undoubtedly give an impetus to bee-keeping in many sections of the territory served by this Station.

WINTERING 1924-25

All colonies went into winter quarters in good shape with ample supply of stores, sugar syrup was fed and each colony weighed about 75 pounds.

Four colonies, one double and three single, were wintered outside in a quadruple wintering-case and one single colony in a cellar. The cellar temperature was around 45 degrees F. The place was reasonably dry and as far as possible outside light was excluded.

The wintering-case was merely a rough box made large enough to accommodate four hives. Cut straw was utilized for packing, using three inches on the bottom and sides and ten inches on the top. The packing-case was exposed to the east and west winds with tunnels about one-half inch high left at the openings on the east and west.

Of the four hives wintered outside, two died. The remaining two came through in a weak condition and were united to make a strong colony. This colony built up well and was removed from the packing-case on May 20.

The colony wintered in the cellar came through the winter in good condition. It was removed from the cellar on April 2 and protected against the cold by use of a canvas until the middle of May.

The honey-flow from the caragana started May 22. Due to unfavourable weather merely enough honey was stored to stimulate brood-rearing.

Sweet clover came into bloom on June 30 and furnished throughout the summer the major portion of extracted honey. While sweet clover was available until October 15, the low yield of honey is accredited to the unfavourable fall weather.

The largest daily yield from one colony was 5¼ pounds. The greatest amount of surplus extracted honey from one colony for the season was 43 pounds.

The season of 1924 was more favourable for bees to gather nectar than 1925. The greatest flow for 1924 from one colony was 90½ pounds of extracted honey, and the highest production for one day for one colony was 9 pounds.

PACKAGE BEES

Five 2-pound packages of bees with mated queens were imported from Montgomery, Alabama. Four were received at this Station on May 4 in good condition; the other package was replaced by the shipper May 20.

All five packages built up well and gave a total of 156 pounds of extracted honey.

SWARM CONTROL

To prevent a lowering of production, swarm control was practised. On examination when larvæ was found in queen-cells the queen was removed and all queen cells destroyed, and the colony kept queenless for ten days. At the end of the ten-day period all further queen-cells were destroyed with the exception of one cell which was left to hatch a queen.

A better plan is to have a young laying queen on hand, in which case all the queen-cells are destroyed, and the young queen introduced by the push-in-cage method. This is done by using a wire cage, about the size of a pocket match-box, made of mosquito netting, and imbedding it, with the queen inside, on a comb on which there is some uncapped honey and empty cells, care being taken not to imbed the introducing cage too deeply. At the end of four or five days the cage is removed and by that time the queen will generally be accepted.

When queens are purchased they are generally mailed in a combination shipping and introducing cage, which has been found quite satisfactory at this Station for introducing purposes.

EXTENSION

During the past season, an exhibit was sent to several of the local agricultural fairs in charge of two men familiar with the experimental work, for the purpose of getting in closer touch with farmers and their problems, and to give them an idea of the work being conducted at the Station.

Fairs visited were Zealandia, Delisle, Eatonia, MacRorie, Luseland and Wilkie. A keen interest was shown at each place, more especially in districts remote from the Station.

The assistant superintendent was with the Experimental Farm exhibit at Saskatoon Exhibition to discuss, with interested farmers, experimental work having a special local application.

The flow of callers seeking advice and information along many lines was constant during the summer. The Annual Grain Growers' picnic, held on July 15, was attended by over two thousand people. Special field days were arranged by the agricultural secretaries from Macklin, Unity, Salvador, Gallivan, Luseland, Loverna and Grassy Lake. These smaller excursions are more satisfactory to the visitor desiring information along special lines of work, as they receive more attention from the members of the staff.

The work at the Station is frequently brought to the attention of the public by a weekly News Letter, mimeographed in the office and sent to forty-six local newspapers in the territory served by this Station.

The superintendent and his assistant addressed a number of farmers' meetings during the year.

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