DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

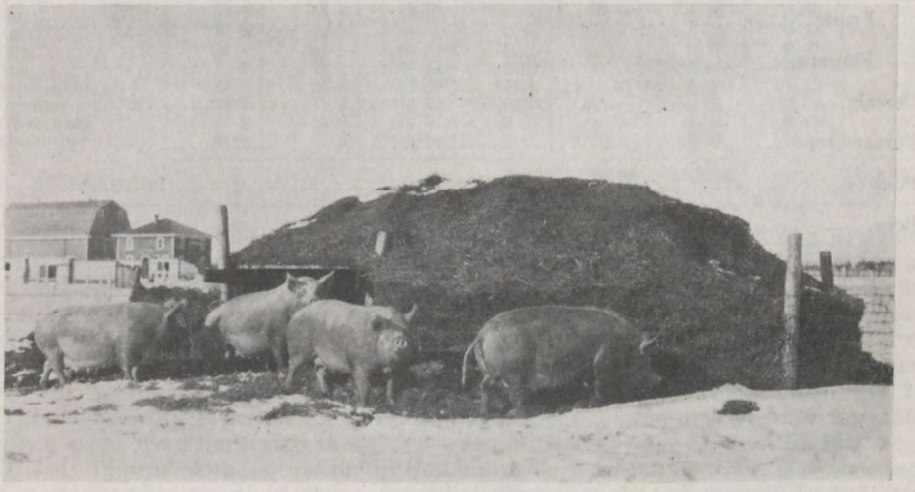
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION
SCOTT, SASK.

REPORT OF THE SUPERINTENDENT

VICTOR MATTHEWS, B.S.A.

FOR THE YEAR 1924



Cheap winter quarters for brood sows.

Printed by Authority of the Hon. W. R. Motherwell, Minister of Agriculture, Ottawa, 1925

TABLE OF CONTENTS

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1925

DOMINION EXPERIMENTAL STATION, SCOTT, SASK.

REPORT OF THE SUPERINTENDENT, VICTOR MATTHEWS, B.S.A.

THE SEASON

The precipitation at Scott for the crop year, August, 1923, to August, 1924, was 8.49 inches, which was 4.48 inches below the average for the past thirteen years. The precipitation during the months of April, May, June and July was 3 inches less than 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 eighty-one days, being eight days less than the average for the past thirteen 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 113 which is the same as the average for the thirteen-year period. A summary of the meteorological data at Scott for the year 1924 is presented in the following table.

METEOROLOGICAL RECORDS FOR SCOTT, 1924

Month	Temperature			Precipitation				Total Sunshine
	Highest	Lowest	Mean	Rainfall	Snowfall	Total	Heaviest in 24 Hours	
	°F	°F	°F	Inches	Inches	Inches	Inches	Hours
January	41·6	−44·0	9·63	0·04	0·75	0·115	0·50	83·2
February	47·0	−33·0	12·30	.....	11·0	1·10	0·40	109·5
March	36·0	−23·5	17·97	.....	11·0	1·10	0·35	131·1
April	66·4	6·9	32·98	.....	10·25	1·025	0·35	203·5
May	83·7	18·6	45·97	0·60	5·0	1·10	0·60	282·5
June	83·5	29·5	54·00	0·58	.....	0·58	0·21	275·8
July	94·0	34·5	63·57	0·70	.....	0·70	0·33	316·1
August	83·7	35·1	57·38	2·87	.....	2·87	0·70	218·2
September	83·6	24·3	52·09	1·60	.....	1·60	1·32	180·3
October	69·7	11·3	43·80	0·31	.....	0·31	0·20	163·3
November	46·2	−15·0	19·57	0·05	10·58	1·11	0·425	85·4
December	41·1	−47·5	• 6·04	.....	9·5	0·95	0·65	80·2
Totals	.....	.....	.....	6·75	58·03	12·56	.....	2,129·1

The result of a heavy frost in the autumn of 1923 followed by a mild winter was considerable winter killing among the willows and fruit trees. The winter of 1923-24 was remarkably mild, most of the 38 inches of snow received fell during February, March and April. The spring season was cool and seeding operations were not general until about May 1. There were frequent frosts during the spring, 13.4 degrees being recorded on May 20 which damaged cereal crops. A drought commenced on June 15 and continued unbroken until July 25. This is the critical period for grain and as a result of the dry weather few good grain crops were harvested in northwestern Saskatchewan. Rains the last week in July improved the situation so that most farmers harvested sufficient wheat for seed and a small quantity for marketing. A second growth in the oats resulted in little threshed grain, but oat sheaves and oat straw roughage of a high feeding quality. The corn crop was practically a failure, but sunflowers and roots gave fair returns. Harvesting operations were carried on with difficulty due to the cool, damp weather and to the short crop. Briefly, the season of 1924 in northwestern Saskatchewan was very disappointing.

94754—1½

ANIMAL HUSBANDRY

The experimental work in animal husbandry is under the supervision of Mr. E. Van Nice, Assistant to the Superintendent, who has compiled the data given under this heading.

CATTLE

The pure-bred Shorthorn herd at this Station on December 31, 1924, totalled 37. The experimental work with the breeding herd consists of feeding and breeding for a higher milk production and at the same time maintaining a good beef type.

The average milk production per cow for the last lactation periods, completed previous to December 31, 1924, was 4,580 pounds. Three cows of the number gave over 6,000 pounds each.

The herd sire used at present is Major Mayflower—156355—bred at Indian Head Experimental Farm and dropped on this Station in December, 1921. He was sired by King Edward—91030—. Major Mayflower is the first calf from Jess Mayflower 2nd, which during her first lactation period gave 7,881 pounds. At two years old he weighed 1,505 pounds and at three, 2,035 pounds. Jess Mayflower is the best individual in the herd and shows a good development of the two qualities desired, namely a good milk flow and the ability to produce a calf of good beef conformation.

The ration fed to the milch cows during the winter usually consists of grain made up of oat chop 5 parts, bran 2 parts, oilcake meal 1 part by weight and roughage consisting of sunflower silage about 20 pounds per day, straw and some hay. The quantity of meal mixture fed during the winter varies from 5 to 8 pounds per day depending upon the milk flow. During the summer when on pasture the bran and oilcake are not fed, but about 4 to 6 pounds of oat chop is given per day.

COST OF RAISING SHORTHORNS

Detailed feed records are kept of the entire herd which make it possible to compute cost of raising breeding stock, etc. This information was published in the 1923 report and will be published again from time to time as two and three-year averages are made available.

STEER FEEDING EXPERIMENT

The objects of the experiment were:—1. To obtain further information as to the value of sunflower ensilage in winter steer feeding. 2. To compare the relative returns from feeding yearlings and two-year-old steers.

One car of mixed steers containing 12 yearlings and 12 two-year-olds was purchased in the fall and divided into four lots. The grain used was a mixture of oat and barley chop. They were started on one-third barley and two-thirds oats and finished on a mixture of equal parts. The amount fed daily to each yearling lot was the same while the two-year-olds received an additional two pounds. The roughages and amount supplied daily varied and were as follows:—

Lot 1. Yearlings.—Straw and medium silage ration.
Lot 2. Yearlings.—Straw.
Lot 3. Two-year-olds.—Straw and full silage ration.
Lot 4. Two-year-olds.—Straw and medium silage ration.

The straw fed was ordinary wheat straw and the steers were given all they would consume., The yearling steers in lot 1, were started on 5 pounds of silage, and this was increased until they received 15 pounds per day. Both lots of two-year-olds were started on the same amount of silage, one lot was increased until

the steers received 20 pounds per day while the steers in the other lot were given all the silage they would consume. The feeding was done in a cheaply constructed shed which gave the steers some protection during the severe winter weather.

The following table gives in detail the results of the feeding test.

YEARLING STEERS VS. TWO-YEAR-OLDS

YEARLINGS—SILAGE VS. NO SILAGE

TWO-YEAR-OLDS—FULL SILAGE RATION VS. MEDIUM SILAGE RATION

—		Yearlings		Two-year-olds	
		Medium Silage ration	No silage	Full silage ration	Medium silage ration
Number of steers in lot		6	6	6	6
Total initial weight	lbs.	4,450	4,440	5,950	5,965
Average initial weight	"	741	740	991	994
Final total weight	"	6,055	5,830	7,670	7,545
Final average weight	"	1,009	971	1,278	1,257
Total gain for period	"	267	231	286	263
Average daily gain per steer for 168 days	"	1·58	1·37	1·7	1·5
Quantity of silage fed for period	"	13,860	.....	26,415	18,000
" wheat straw fed for period	"	6,744	7,200	7,992	9,336
" oats fed for period	"	5,955	5,955	7,191	7,191
" barley fed for period	"	3,073	3,073	3,652	3,652
" salt fed for period	"	40	40	40	40
" hay fed for period	"	120	120	120	120

COST OF FEED AND RETURNS

	$ cts.	$ cts.	$ cts.	$ cts.
Silage at $3 per ton	20 79	.....	39 62	27 00
Straw at $1 per ton	3 37	3 60	4 00	4 67
Grain—oats at 1c. per lb. barley at ¾c. per lb. and crushing at $1.50 per ton	89 37	89 37	107 43	107 43
Salt at $1.75 per cwt	0 70	0 70	0 70	0 70
Hay at $7 per ton	0 40	0 40	0 40	0 40
Total cost of feed	114 65	94 09	152 17	140 22
Initial cost of steers	172 92	172 92	227 16	227 16
Initial cost plus cost of feed	287 57	267 01	379 33	367 38
Appraised selling price—				
Yearlings at $5.50 per cwt	333 03	320 65	.....	.....
Two-year olds at $6 per cwt	.....	.....	460 20	452 70
Net profit per lot	45 46	53 64	80 87	85 32
Net profit per steer	7 58	8 94	13 48	14 22

The hay listed in the above table was fed to the steers previous to loading for Montreal.

The table following gives the average daily ration for the entire period:—

AVERAGE DAILY RATION FOR FEEDING PERIOD

—	Lot 1	Lot 2	Lot 3	Lot 4
	lbs.	lbs.	lbs.	lbs.
Straw	6·69	7·14	7·93	9·26
Silage	13·75	.....	26·20	17·86
Chop	8·96	8·96	10·76	10·76

The daily gains made by the four lots were fair. The yearlings in lot 2 made an average daily gain of 1.37 pounds while those in lot 1, getting a medium ration of silage, made an average gain of 1.58 pounds. The two-year-old lot getting a medium ration of silage made about the same gains as the yearling lot getting silage, while the two-year-olds getting a full ration of silage made the best daily gains for the entire feeding period.

At the conclusion of the feeding test the steers were appraised at what they would have netted per hundredweight at Scott had they been sold on the Winnipeg market. This was deemed advisable on account of including them in the shipment of store cattle consigned to England in May, 1924. There was no perceptible difference in degree of finish between the yearling lots, and as a result they were appraised at the same price, which was 5½ cents per pound. Both two-year-old lots were appraised at 6 cents per pound.

The actual cost of growing and ensiling sunflower silage during the year 1923 was $3.01 per ton. By valuing the silage fed at $3 per ton it will be observed that it did not pay in this experiment to feed it to yearling steers, as the lot not receiving silage returned a profit of $8.94 per head as against a profit from the silage-fed lot of $7.58 per head. The two-year-old lot getting the medium ration of silage returned a profit of $14.22 per head, while the lot getting the heavy ration returned $13.48 per head.

The local feeder would no doubt be interested to know the comparative net profits from yearlings and two-year-olds when marketed in Great Britain, as compared to selling them on the Winnipeg market. It cost $12.67 per head to take steers to Montreal, or $1.29 per hundred pounds; this includes freight and other rail charges as well as attendant charges. The twenty-four steers lost on an average 149 pounds per head, or 13.2 per cent, from Scott to Montreal. The fill in Montreal, that is the difference in weight off cars and when they were fed and watered, was 51 pounds per head or 4.6 per cent. The steers gained on an average 3 pounds per head during the ocean travel. The yearlings sold in England at a total loss from Scott of 80 pounds per head or 8.1 per cent, while the two-year-olds lost 111 pounds per head or 8.8 per cent.

It cost $39.96 per head to ship cattle from Scott to England. This amount was made up of all charges including those at port of debarkation.

The yearlings returned a greater gross price at Manchester, England, than the two-year-olds, but the latter returned a greater net price at Farm. This is accounted for by the fact that the expenses for transportation other than rail freight charges were the same for both the yearlings and the two-year-olds, while the average delivered weight at Manchester, on which the price was realized, was 247 pounds less per yearling steer.

When the original cost price plus the cost of the feed are taken into consideration the yearlings netted $1.93 per steer more on the Winnipeg market than at Manchester, while the two-year-olds returned $1.16 more per steer by being exported to Great Britain. These figures indicate greater profit when exported for the older steers, when comparative quality was about equal, due to the expenses of transportation being the same for both yearlings and two-year-olds.

SHEEP

Three breeds of sheep are represented at this Station: Shropshire, Cheviot, and Rambouillet.

The Shropshire is a well-known utility breed and is quite popular in some districts. The Cheviot is a very attractive animal, a good feeder and does well on short pasture but is not as good in fleece as the other breeds mentioned. The Rambouillet has a very dense fleece of high quality, much superior to that of Shropshire or Cheviot. The average clip for the flock for 1924 was 7¾ pounds and the net price received was 25 cents per pound.

At the end of the year 1924 the flock consisted of fifty-four lambs, twenty grade ewes of each of the three breeds, eight pure-bred Cheviot ewes, three pure-bred Shropshire ewes, a pure-bred ram of each breed and one extra Cheviot ram.

A representative flock of each of the three breeds is being graded up by use of pure-bred sires. The beginning in each case was with grade Shropshire females.

GOITRE

Some losses of lambs have been caused by goitre. However, this has been controlled by feeding potassium iodide dissolving it in water and mixing with dry salt. Two per cent potassium iodide in the salt has been found to be a successful preventive, but as the potassium iodide is rather expensive, further work is being done in attempting to find the minimum quantity which may be used with success.

During the winter of 1923-24 the breeding ewes were divided into three lots with the object of testing different quantities of potassium iodide supplied with salt to prevent goitre in lambs. Previous experiments showed that a control was effected by supplying two per cent of potassium iodide in the salt during the gestation period. In the 1923-24 experiment, one lot received two per cent potassium iodide in the salt; a second lot received only one per cent, and the third lot was used as a check, receiving common salt containing no potassium iodide.

For several years past considerable goitre has been found among the lambs from ewes receiving no potassium iodide. However, in the spring of 1924, for some unknown reason, no goitre was found in either the treated lots or the check lot although the ewes in the check lot had never received potassium iodide. Such irregularities cannot be accounted for but further tests are being made. Many authorities believe that an immeasurably small quantity of potassium iodide will be effective where goitre exists.

SHEEP FEEDING EXPFRIMENTS

In the feeding experiments with lambs the cost of feeds was as follows:—

Oats	$ 0 34 per bushel
Barley	0 36 "
Bran	1 30 per hundred
Oil-cake meal	2 80 "
Roots	4 00 per ton
Silage	4 00 "

TURNIPS FOR FATTENING LAMBS

Two lots of fourteen lambs each were used for this experiment. The same feed and treatment were given to both except that one lot was fed turnips. The grain was fed whole.

TURNIPS VS. NO TURNIPS

—		Turnips	No Turnips
Number of lambs in lot		14	14
First gross weight	lb.	998	958
First average weight	"	71·2	68·4
Finished gross weight	"	1,202	1,119
Finished average weight	"	85·8	79·9
Total gain in 69 days	"	204	161
Average gain per head	"	14·5	11·5
Average daily gain per head	"	0·21	0·16
Amount of oats eaten	"	593	593
Amount of barley eaten	"	254	254
Amount of bran eaten	"	238	238
Amount of oil-cake eaten	"	185	185
Amount of roots eaten	"	931	.....
Amount of oat straw eaten	"	1,449	1,449
Total cost of feed	$	21·27	19·41
Grain mixture required per 100 pounds gain	lb.	622	788
Total feed cost per 100 pounds gain	$	10·42	12·05

Turnips have improved the ration of grain and oat straw and reduced the cost per pound gain. It should also be stated that several experiments have been conducted in the past and previously reported in which sunflower silage was compared with turnips for lambs, and the results have almost without exception been in favour of the silage.

CROSS-BRED LAMBS AS FEEDERS

The lambs in this experiment were all practically nine months old at the beginning of the experiment. Each lot was from a different breed of sire, Shropshire, Rambouillet and Cheviot all pure-bred, but the dams in every case were grade Shropshires. Fifteen lambs of each breeding were placed in separate lots and each lot was given the same feed and treatment. None of the grain was crushed. The Cheviots were in slightly higher condition than the other two lots at the beginning of the feeding period although they had all been in the same flock from birth.

CROSS-BRED LAMBS AS FEEDERS

—		Shropshire	Rambouillet	Cheviot
Number of lambs in lot		15	15	15
First gross weight	lb.	969	975	978
First average weight	"	64·6	65	65·2
Finished gross weight	"	1,290	1,259	1,220
Finished average weight	"	86	83·9	81·3
Total gain in 73 days	"	321	284	242
Average gain per head	"	21·4	18·9	16·1
Average daily gain per head	"	0·29	0·25	0·22
Amount of oats eaten	"	654	654	654
Amount of barley eaten	"	294	294	294
Amount of bran eaten	"	258	258	258
Amount of oil cake eaten	"	202	202	202
Amount of silage eaten	"	630	630	630
Amount of roots eaten	"	315	315	315
Amount of oat straw eaten	"	1,642	1,642	1,642
Total cost of feed	$	21·27	21·27	21·27
Meal mixture required per 100 pounds gain	lbs.	438	499	581
Total cost of feed per 100 pounds gain	$	6·62	7·84	8·78

The weights show that there was very little difference in average size of lambs of different breeding. The Shropshires made the greatest gains and the Cheviots the least. All three lots were profitable feeders. The greatest difference in meal mixture required per 100 pounds gain was 143 pounds between the Cheviot and Shropshire lots. A part of the difference is due to the fact that the Shropshires were comparatively thin and consequently made very rapid gains for a time. The Cheviots should be given credit for being in higher condition than the Shropshires previous to starting the experiment although on the same pasture. The Rambouillets are so much superior in quality and quantity of fleece that if all other things are even approximately equal this breed should give the greatest returns.

On October 17, 1924, ten lambs of each breeding were placed in a dry lot and fed grain until November 3. The Shropshires gained 28 pounds, the Cheviots 60 pounds and the Rambouillets 35 pounds. These lambs were then shipped to Edmonton and were sold on the market at 11½ cents per pound, which was the top price on that date. The superintendent of the packing plant to which they were taken, graded them after killing as follows: Cheviots, all No. 1; Rambouillet and Shropshire, each lot five No. 1 and five No. 2. The Cheviots dressed 50 per cent, the Rambouillets 50 per cent, and the Shropshires 48 per cent; all were starved forty-eight hours before killing.

EARLY VS. LATE WEANING OF LAMBS

On August 21, 1924, twenty lambs were weaned, placed on rape pasture and fed grain. Twenty others were weighed and left with the ewes on prairie pasture. On September 29 the remainder was weaned and weighed. It was found that

Weaning lambs on rape pasture.

the early weaned lambs on rape pasture which were getting grain had gained 132 pounds more than the other lot that had not been weaned. The dams were weighed on the same dates and the variation in weight was but 15 pounds between lots this being in favour of the ewes which had the lambs still suckling.

HORSES

During the past four years the Station has been a member of the Scott Percheron Club, which was organized for the purpose of taking advantage of federal Government assistance offered in hiring a high quality stallion for use in this district.

Four pure-bred Percheron mares were secured for this district in 1920, and as a result of the increase there are now fourteen pure-bred Percherons at the Farm, eight of which are under three years old. The brood mares are used for moderate work but so far the most of the heavy work has been done by the grade work horses.

Very little experimental work has been conducted with horses during the past year. Sunflower silage was fed to one horse in each of several teams during the winter of 1923-24. Those getting silage seemed to show a little more thrift. There was no difficulty experienced from feeding sunflower silage as the silage was very carefully selected, thus eliminating any mouldy silage, which may be harmful.

SWINE

The breeding herd at this Station on December 31, 1924, consists of thirteen females, eleven Yorkshires, two Berkshires, and four boars—two Yorkshires, one Berkshire and one Tamworth.

The chief objects of the work with swine at this Station are to study feeding and breeding principles which may be of benefit particularly to the swine breeders of the northwest.

The cost of feed used in the swine feeding experiments was as follows:—

Oat chop	$ 0 34	per bushel
Barley chop	0 36	"
Rye chop	0 75	"
Bran	1 45	per hundred
Shorts	0 86	"
Tankage	2 75	"
Oilcake meal	2 80	"

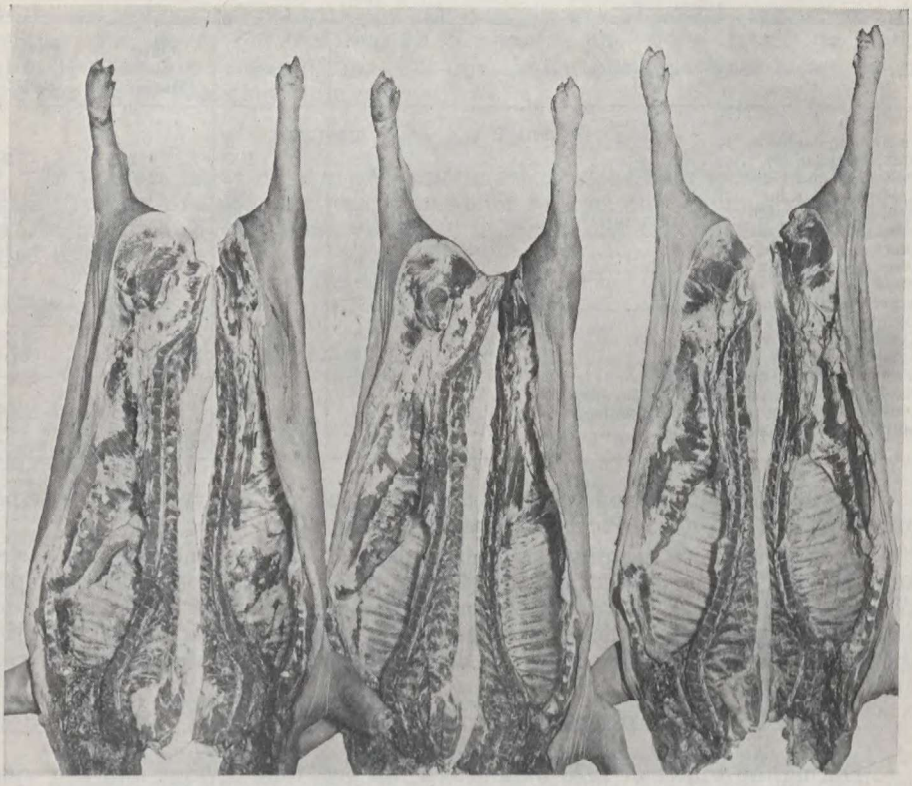
QUANTITY OF GRAIN FOR GROWING PIGS

With a view to comparing results from feeding different quantities of grain, an experiment was conducted during the summer of 1924 in which three lots of pigs were fed with pasture and three lots without it. The lots receiving no pasture were made up of pure-bred Yorkshires, while the three lots on pasture consisted chiefly of Tamworth-Berkshire cross-breds; hence those on pasture were not comparable with the other three lots. The quantities of grain fed were according to the weight of the pigs—3, 3½ and 4 per cent of the live weight. This amount was fed per day to the respective lots until the latter part of the feeding period when each lot was given all they would consume.

It should be noted that the lots on pasture are not comparable to the other three lots, not only on account of the difference in breeding, but because the experiment on pasture did not cover as long a period of time as the other.

QUANTITY OF GRAIN FOR GROWING PIGS

—		On Rape Pasture			No Pasture		
Per cent of live weight fed per day	%	3	3½	4	3	3½	4
Number in each lot		5	5	5	6	6	6
First weight of lot	lbs.	329	334	333	270	271	270
First average weight	"	66	67	66	45	45	45
Final weight of lot	"	948	950	1,087	1,098	1,132	1,326
Final average weight	"	189	190	217	183	188	221
Number of days in experiment		114	114	114	153	153	153
Total gain	lbs.	619	616	754	828	861	1,056
Average gain each	"	124	123	151	138	143	176
Average daily gain each	"	1·08	1·07	1·32	0·90	0·93	1·15
Total amount of feed eaten	"	2,467	2,729	3,096	3,029	3,322	3,973
Oat chop eaten	"	1,234	1,388	1,609	1,607	1,810	2,184
Barley chop eaten	"	708	776	875	824	881	1.051
Rye chop eaten	"	389	413	437	419	435	493
Tankage eaten	"	136	152	175	179	196	245
Total cost of feed	$	26·60	29·41	33·31	32·78	35·91	42·96
Feed cost per 100 lb. gain	$	4·29	4·77	4·41	3·95	4·17	4·06
Pounds of feed required per 100 lb. gain	lb.	398	443	412	365	385	376
Gross selling price at $8.15 per hundred	$	77·26	77·42	88·59	89·48	92·25	108·06
Selling price less cost of feeds	$	50·66	48·01	55·28	56·70	56·34	65·10



Hog graded on rail, showing over finish, select bacon, under finish.

The lot getting only 3 per cent of the live weight in grain with no pasture was very hungry even after eating its small allowance of grain. This was not as noticeable in the lot on pasture getting a similar quantity of grain. The lot getting 4 per cent of their live weight in grain per day appeared to have sufficient to satisfy their hunger, even those which received no pasture. In both tests the lot getting the heaviest ration gave the greatest returns over the cost of feed. The grading on the market did not favour one system of feeding more than another.

OATS VS. OATS AND BARLEY VS. OATS AND RYE

In this experiment self-feeders were used. One lot of pigs received oat chop only, another oat and barley chop and the third oat and rye chop.

The proportion of barley to oats was at all times the same as rye to oats, beginning with one-quarter barley or rye and finishing with a ration of equal parts of each, respectively.

It was thought when undertaking this experiment that the feed might have some influence on the type developed in the lot getting oats only but the grading of the pigs on the market at the end of the experiment was such that no deductions could be drawn in this regard.

OATS VS. OATS AND BARLEY VS. OATS AND RYE

—		Oats	Oats and Barley	Oats and Rye
Number in each lot		5	5	5
First weight of lot	lb.	269	269	275
First average weight	"	54	54	55
Final weight of lot	"	966	1,308	1,034
Final average weight	"	193	207	207
Total gain in 114 days	"	697	769	759
Average gain each	"	139	154	152
Average daily gain each	"	1·21	1·35	1·33
Total quantity of feed eaten	"	3,625	4,119	4,184
Oat chop eaten	"	3,625	2,357	2,388
Barley chop eaten	"	.....	1,762	.....
Rye chop eaten	"	.....	.....	1,796
Total cost of feed	$	36·25	36·78	47·93
Feed cost per 100 pounds gain	$	5·20	4·78	6·31
Pounds of feed required per 100 lb. gain	lb.	520	535	551
Gross selling price at $8.15 per hundred	$	78·72	84·59	84·27
Selling price less cost of feeds	$	42·47	47·81	36·34

The lot getting oat and rye chop ate more feed and the rye at 75 cents per bushel proved too expensive in comparison to the other feeds.

The average gain was practically the same in the lots getting oats and barley and oats and rye, but the lot getting straight oats made 15 pounds less per pig. While the amount of feed required for 100 pounds gain was lowest in the lot getting oats only, when the cost of the feed is deducted from the selling price the balance or net profit is in favour of the lot getting a grain mixture of oats and barley.

HULLESS OATS FOR GROWING PIGS

During the winter of 1923-24 fourteen fall pigs were divided into two equal lots. One lot was fed a meal mixture containing common oat chop, and the other received the same mixture with the exception that the common oat chop was replaced by hulless oat chop. Approximately 25 per cent was allowed for hulls on the common oats.

HULLESS OATS FOR GROWING PIGS

—		Common Oats	Hulless Oats
Number in each lot		7	7
First weight of lot	lb.	286	286
First average weight	"	41	41
Final weight of lot	"	1,281	1,441
Final average weight	"	183	206
Total gain in 171 days	"	995	1,155
Average gain each	"	142	165
Average daily gain each	"	0·80	0·93
Total quantity of feed eaten	"	4,320	3,635
Oat chop eaten	"	2,814	2,129
Shorts eaten	"	22	22
Rye eaten	"	266	266
Barley eaten	"	707	707
Tankage eaten	"	90	90
Bran eaten	"	282	282
Oil cake eaten	"	139	139
Total cost of feed	$	47·61	40·76
Feed cost per 100 pounds gain	$	4·78	3·52
Pounds of feed required per 100 pounds gain	lb.	434	314
Gross selling price at $6 per hundred	$	76·86	86·46
Selling price less cost of feeds	$	29·25	45·70

The quantity of feed required per hundred pounds gain was 120 pounds less in the lot getting hullness oats, the gain per pig was 23 pounds greater and the selling price, less cost of feed, was $2.35 more per pig. These results, in favour of hulless oats are rather striking; but in a similar experiment conducted during the summer of 1924 they were not so great.

HULLESS OATS FOR GROWING PIGS

In the last thirty days of the experiment common oats were used for both lots. Twenty-five per cent was allowed for hull on the common oats. Some shorts, bran and oilcake meal were used in the former experiment but were not used in this test.

HULLESS OATS FOR GROWING PIGS

—		Common Oats	Hulless Oats
Number in each lot		6	6
First weight of lot	lb.	150	150
First average weight of lot	"	25	25
Final weight of lot	"	998	982
Final average weight	"	166	163
Total gain in 186 days	"	848	833
Average gain each	"	141	139
Average daily gain each	"	0·75	0·74
Total quantity of feed eaten	"	3,771	3,326
Oat chop eaten	"	2,188	1,748
Barley chop eaten	"	1,189	1,189
Rye chop eaten	"	344	344
Tankage eaten	"	50	50
Total cost of feed	$	36·76	32·36
Feed cost per 100 pounds gain	$	4·33	3·52
Pounds of feed required per 100 pounds gain	lb.	444	399
Gross selling price at $8.15 per hundred	$	81·33	80·03
Selling price less cost of feeds	$	44·57	47·67

The average gain per pig shows a difference of merely two pounds, but the feed required per hundred pounds gain is 45 pounds less in the lot receiving hulless oats. The selling price, less cost of feed is $3.10 in favour of the same group.

RAPE PASTURE VS. DRY LOT

On account of the very dry weather the rape pasture was not as luxuriant as usual. The quantity of feed was the same for both lots until the latter part of the feeding period when a full ration was given.

RAPE PASTURE VS. DRY LOT

—		Pasture	Dry lot
Number in each lot		5	5
First weight of lot	lb.	273	285
First average weight	"	54	57
Final weight of lot	"	911	850
Final average weight	"	182	170
Total gain in 114 days	"	638	565
Average gain each	"	127	113
Average daily gain each	"	1·59	1·49
Total quantity of feed eaten	"	2,560	2,390
Oat chop eaten	"	1,222	1,182
Barley chop eaten	"	775	740
Rye chop eaten	"	357	322
Tankage eaten	"	206	146
Total cost of feed	$	28·47	25·69
Feed cost per 100 pounds gain	$	4·46	4·54
Pounds of feed required per 100 pounds gain	lb.	401	423
Gross selling price at $8.15 per hundred	$	74·24	69·27
Selling price less cost of feeds	$	45·77	43·58

The pigs in the dry lot were not as thrifty as those on pasture and did not consume as much feed during the finishing period when a full ration was given. Two pigs were discarded from the experiment on account of unthriftiness, which may, or may not have been due to being confined in a dry lot. The results have been figured from the gains made by the remaining three pigs, but to make the results comparative with the other lot, calculations were made on a basis of five pigs. The pasture lot gave higher returns but the difference was not as great as in similar experiments previously conducted.

TANKAGE VS. NO TANKAGE

One of the most common substitutes for milk as a protein food for growing pigs is tankage. An experiment was conducted during the summer of 1924 when all feeding and other conditions were the same, except that one lot received tankage and at the latter part of the feeding period a full ration was given for finishing when the tankage-fed lot consumed a little more grain. The quantity of tankage used was 8 per cent of the grain ration by weight.

TANKAGE VS. NO TANKAGE

		Tankage	No Tankage
Number in each lot		5	5
First weight of lot	lb.	273	276
First average weight	"	54	55
Final weight of lot	"	911	882
Final average weight	"	182	176
Total gain in 114 days	"	638	606
Average gain each	"	127	121
Average daily gain each	"	1·11	1·06
Total quantity of feed eaten	"	2,560	2,554
Oat chop eaten	"	1,222	1,342
Barley chop eaten	"	775	824
Rye chop eaten	"	357	388
Tankage eaten	"	206	.....
Total cost of feed	$	28·47	24·79
Feed cost per 100 pounds gain	$	4·46	4·09
Pounds of feed required per 100 pounds gain	lb.	401	400
Gross selling price at $8.15 per hundred	$	74·24	71·88
Selling price less cost of feeds	$	45·77	47·09

The difference between the two lots was not sufficient to pay for the tankage used in this test. It is probable that better results would have been obtained had it been fed from weaning time, and reduced in quantity during the latter part of the feeding period.

BERKSHIRE VS. YORKSHIRE

To compare the economy of gains made by these two breeds, two lots were placed under identical conditions and given the same feed until the end of the feeding period when a full ration was given. While on full ration the Berkshires ate a little more than the Yorkshires.

—		Berkshire	Yorkshire
Number in each lot		5	5
First weight of lot	lb.	233	273
First average weight	"	46	54
Final weight of lot	"	992	911
Final average weight	"	198	182
Total gain in 114 days	"	759	638
Average gain each	"	152	127
Average daily gain each	"	1·33	1·11
Total quantity of feed eaten	"	2,600	2,499
Oat chop eaten	"	1,259	1,222
Barley chop eaten	"	807	775
Rye chop eaten	"	389	357
Tankage eaten	"	145	145
Total cost of feed	$	27·82	26·79
Feed cost per 100 pounds gain	$	3·66	4·21
Pounds of feed required per 100 pounds gain	lb.	342	391
Gross selling price at $8.15 per hundred	$	80·84	74·24
Selling price less cost of feeds	$	53·02	47·45

The Berkshires gained 121 pounds more than the Yorkshires and required 49 pounds less grain per 100 pounds gain.

The selling price, less cost of feed, amounted to $5.57 in favour of the Berkshires.

FIELD HUSBANDRY

CROP ROTATIONS

Experiments in crop rotations have been conducted at this Station for thirteen years. Three of the rotations started in 1911 are still in operation but one of these has been slightly modified. Three new rotations were added in 1920 and one new rotation this season.

These rotations include straight grain crops, grain with hay and pasture crops, grain with hay and sunflowers, grain with hay and summer-fallow substitutes.

Records have been kept each year of all items of expense and returns since the rotations were started. Prior to 1920 a fixed set of values was used in calculating the rotation returns. In computing the results of 1920 and since, values are based on current prices paid during each year.

COST VALUES FOR THE SEASON 1924

Rent and taxes	per	acre	$ 3 20
Manure	"	ton	1 00
Seed wheat	"	bushel	1 00
Seed oats	"	"	0 50
Seed barley	"	"	0 75
Seed rye	"	"	0 90
Sunflower seed	"	pound	0 10½
Sweet clover seed	"	"	0 13
Western rye grass seed	"	"	0 10
Twine	"	"	0 14½
Machinery	"	acre	0 90
Manual labour	"	hour	0 30
Horse labour per horse	"	"	0 10
Threshing:—			
Wheat	per	bushel	$ 0 13
Barley	"	"	0 09
Oats	"	"	0 08
Rye	"	"	0 10

RETURN VALUES FOR THE SEASON 1924

Wheat (prices as on Oct. 1, 1924)	per	bushel	$ 1 30
Oats	"	"	0 51
Barley	"	"	0 72
Rye	"	"	1 00
Western rye hay	"	ton	9 00
Sweet clover hay	"	"	9 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 one acre for each of the crops. The charges against the summer-fallow include rent, machinery and labour, and the cost of the summer-fallow is distributed over all of the crops in the rotation. The cost of grass and clover seed is distributed equally among each hay and pasture year in the rotation.

CULTIVATION OF ROTATIONS.—The summer-fallow fields of all the rotations are 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 the duckfoot cultivator and rod weeder.

From two to three cultivations were found necessary to keep the weeds in check. Fields growing sunflowers were hoed and given from two to three cultivations during the summer. In the spring previous to seeding on summer-fallow the fields were harrowed, while fields in hoed crop the previous season were cultivated. Wheat stubble was ploughed and packed in the fall and harrowed the following spring previous to seeding. The second crop wheat stubble was spring ploughed, packed and harrowed. Sod land to be summer-fallowed was ploughed the middle of June, packed and disked and given a cultivation later in the season as well as the following spring before seeding. When manure was applied it was ploughed under in summer-fallowing.

SEEDING OF ROTATIONS.—The varieties of the various crops used and the rates and dates of seeding were:—

Winter rye, Dakold, 1 bushel per acre, September 3.
Spring wheat, Marquis 10B, 1½ bushels per acre, April 28 to May 3.
Oats, Banner, 2 bushels per acre May 3–May 14.
Barley, Duckbill, 2 bushels per acre, May 19.
Sunflowers, Mammoth Russian, 14 pounds per acre, May 13.
Sweet clover, white, 15 pounds per acre, May 3.
Western rye, 15 pounds per acre, May 12.

When sweet clover and rye grass were combined a mixture of 12 pounds of rye grass and 6 pounds of sweet clover was used. The rate of seeding of wheat was reduced from 1½ bushels to 1 bushel per acre when seeding down to sweet clover. When oats were used as a nurse crop 1½ bushels per acre was found to be sufficient.

FIELD "A," WHEAT CONTINUOUSLY

One field has been seeded to wheat each year since 1912. The field is 98 feet 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. This field is ploughed in the fall or spring, worked down and seeded. Some years a good crop has been secured but in dry years the crop has failed. Even with the increased moisture from the extra snow which lodged on this field the 1924 crop showed a loss of $7.92 per acre. The value of the crop was $4.55 and the cost of production $12.47, while the cost per bushel of wheat was $3.56.

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 or arrangement of crops was commenced in 1922 to compare it with Rotation "C"—Summer-fallow, wheat, wheat.

SUMMARY OF YIELDS, VALUE, AND PROFIT AND LOSS PER ACRE, 1924

Crop	Yields		Value	Cost of Production	Profit (+) or Loss (−)
	Average for 4 years	1924			
			$ cts.	$ cts.	$ cts.
Summer-fallow	.....	.....	.....	7 48	−7 48
Wheat	21·0	9·9	12·87	8 77	+4 10

It will be observed that this arrangement of crops returned a loss of $1.69 per acre, due to charging the total cost of the summer-fallow against the one crop. For the three years this rotation has been operating it shows an average loss of $0.05 per acre.

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 some farmers in this district. It has the advantage over Rotation "B" in that only one-third instead of one-half of the farm is lying idle each year.

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS, 1924

Crop	Yields		Value	Cost of Production	Profit (+) or Loss (−)
	Average for 13 years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Summer-fallow	.....	.....	.....	9 55	−9 55
Wheat	19·56	7·0	9 10	8 39	+0 71
Wheat	16·2	2·0	2 60	11 18	−8 58

The rotation showed a loss per acre this season of $5.81. This was the result of the disappointing yield of wheat following summer-fallow and more especially wheat following wheat. Taking the average for the past five years into consideration it shows a profit of $2.65 per acre and for the past thirteen years a profit of $3.31 per acre over all expenditures including, rent, labour, machinery, etc.

ROTATION—SWEET CLOVER (THREE YEARS' DURATION)

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

This rotation has been in operation since 1922. It was started with the object of determining the advisability of including sweet clover in a crop rotation. The arrangement above shows one-third of the land in summer-fallow, one-third in wheat, one-sixth sweet clover and one-sixth in oats.

When seeding the 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 15 pounds of sweet clover to one bushel of wheat per acre.

As this rotation involves a comparison of sweet clover with oats in the third year, the following division is made to make this comparison more easily followed:—

SUMMARY OF YIELDS, VALUE, AND PROFIT AND LOSS, 1924

Crop	Yields		Value	Cost of Production	Profit (+) or Loss (−)
	Average for for 3 years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Summer-fallow				9 58	−9 58
Wheat	20·6	11·14	14 49	8 05	+6 44
	tons	tons			
Sweet clover	1·56	·97	8 73	9 24	−0 51
Summer-fallow				9 58	−9 58
	bush.	bush.			
Wheat	23·7	11·14	14 49	8 55	+5 94
Oats	38·9	16·3	9 00	8 76	+0 24

The sweet clover roots besides adding fibre to the soil have the property of taking nitrogen from the air and so enriching the land. This rotation has not been established for sufficient length of time for the wheat crop to get the benefit of the legume.

It will be noted that there was a loss of 3.1 bushels per acre from using wheat as a nurse crop for the three-year period. The returns from this rotation for the past season show, where sweet clover follows wheat, a loss of $1.22 per acre, and where oats follow wheat, a loss of $1.13 per acre. The average returns for the past three years give a profit of $1.10 per acre where sweet clover follows wheat, and a profit of $1.41 where oats follow wheat. The comparative difference is only slight but over a longer period of years it is hoped that sweet clover may prove of value in aiding to solve some of our dry land rotation problems.

ROTATION—FALL RYE (THREE YEARS' DURATION)

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

This rotation has been in operation since 1922. It was started with a view of trying fall rye under field conditions. The practice followed when seeding the wheat in the spring is to seed one-half of the field with a mixture of rye and wheat at the rate of one bushel of each per acre and the other half of the field to wheat alone. In the latter half, fall rye is seeded in the wheat stubble at the time of cutting.

Since the yields of wheat and fall rye are each kept separate in the second and third years respectively, the following division is made to make the results more easily followed:—

SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS, 1924

Crop	Yield 1924	Value	Cost of Production	Profit (+) or Loss (−)
	bush.	$ cts.	$ cts.	$ cts.
Summer-fallow			11 83	−11 83
Wheat with fall rye	15·0	19 50	9 89	+ 9 61
Fall rye (failure) resown to oats	16·7	8 52	10 18	− 1 66
Summer-fallow			11 83	−11 83
Wheat alone	15·0	19 50	9 89	+ 9 61
Fall rye (on stubble)	2·6	2 57	7 31	− 4 74

During the winter of 1923-24 the fall rye seeded with the wheat in the spring was a total failure. In order to save the land from being idle the field was reseeded to oats with the result that 8.37 bushels per acre were harvested. As the extent of winter killing of winter rye conforms with the findings of the two previous seasons it is safe to conclude that seeding winter rye in the spring with wheat is not a practice to be recommended for this district.

The rye seeded in the autumn on the wheat stubble yielded 2.6 bushels per acre and resulted in a loss of $4.74 per acre. As this rotation has been changed each year, the average results for the three years are not given in the preceding table.

ROTATION "J" (SIX YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—Oats.
Fourth year—Oats seeded down.
Fifth year—Hay.
Sixth year—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 noted that one-half the area is in grain each year, one-third in hay and pasture, and one-sixth in summer-fallow.

The system followed in seeding down is to mix the western rye grass with the oats and sow the mixture with the grain drill. The first year's grass crop is usually taken off for hay and the second year's crop 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 field supply considerable fall pasture.

SUMMARY OF YIELDS, VALUE, AND PROFIT AND LOSS, 1924

Crop	Yields		Value	Cost of Production	Profit (+) or Loss (−)
	Average for 13 years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Summer-fallow			0 37	7 81	−7 44
Wheat	25·8	7·35	10 35	8 40	+1 95
Wheat (7 years, 1912–1918)	18·18				
Oats (6 years, 1918–1924	38·3	7·25	4 63	10 35	−5 72
Oats	45·0	8·75	6 52	9 60	−3 08
Hay and pasture	0·87 tons	Pastured	1 66	6 30	−4 64
Pasture	9 yr. ave.	"	6 89	4 98	+1 91

The yields from Rotation " J " for the crop year 1924 are very much lower than the average for the 13-year period. They are, however, slightly higher than the average yields in the surrounding district. For the past five years this rotation has shown a profit of $3.36 per acre, and for the thirteen-year period, a profit of $4.24 per acre, which is greatly in excess of Rotation " C " (summer-fallow, wheat, wheat).

ROTATION " P " (EIGHT YEARS' DURATION)

First year—Summer-fallow.
Second year—Wheat.
Third year—Wheat.
Fourth year—Summer-fallow (manure 12 tons per acre).
Fifth year—Sunflowers.
Sixth year—Barley seeded down.
Seventh year—Hay.
Eighth year—Hay.

Once in eight years manure is applied to each field and ploughed down at the time of ploughing for summer-fallow. 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 the barley at time of seeding. With the exception of 1923 the crop of barley following sunflowers has been very light.

SUMMARY OF YIELDS, VALUE, AND PROFIT AND LOSS, 1924

Crop	Yields		Value	Cost of Production	Profit (+) or Loss (−)
	Average for 13 years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Summer-fallow	.....	.....	.....	7 52	− 7 52
Wheat	22·2	5·0	6 50	10 78	− 4 28
Wheat	15·9	3·0	3 90	14 13	−10 23
Summer-fallow	.....	.....	.....	10 17	−10 17
Sunflowers	(5 years) 8·34	tons 6·58	23 03	21 48	+1 55
Barley (1922 ensiled)	(4 years) 22·9	bush. 6·0	4 32	10 79	− 6 47
Hay	(5 years) 1·27	tons 0·75	6 75	9 86	− 3 11
Hay	(4 years) 0·88	0·36	3 24	8 64	− 5 40

It will be noted that the average yield for thirteen years in all cases is not shown; this is due to the crops being changed since the rotation was established. This rotation shows an average loss of $5.70 per acre for the exceptionally dry season of 1924. The average returns for the past five years are 44 cents per acre, while for the thirteen-year period it amounts to $2.03 per acre. Comparing this rotation with Rotation " J " from a financial standpoint, the latter is preferred.

SUMMARY OF ROTATION EXPERIMENTS

In order that the result 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 profit per acre for the past thirteen years. Prior to 1920 a fixed set of values were used in calculating the rotation returns. In computing the results of 1920 and since, values are based on current prices paid during each year.

COSTS, RETURNS AND PROFITS FROM ROTATION

Rotation	Average cost to operate per acre for 5 years	Average returns per acre 5 years	Average profit per acre 5 years	Average profit per acre 13 years
	$ cts.	$ cts.	$ cts.	$ cts.
"C" (three years' duration)	11 33	13 98	2 65	3 31
"J" (six years' duration)	10 79	14 15	3 36	4 24
"P" (eight years' duration)	14 48	14 92	0 44	2 03

CULTURAL EXPERIMENTS

The purpose of the cultural work is to test various cultural methods and to study the effect on crop production.

DEPTH OF PLOUGHING SUMMER-FALLOW

The depths of ploughing have been from three to eight inches with some subsoiling four inches below the sole of the furrow as shown in the following table. The date of ploughing the fallow has been early June, and the treatment following the ploughing has been identical on each plot.

DEPTH OF PLOUGHING SUMMER-FALLOW

Treatment given	Yield of wheat after summer-fallow		Yield of oats the following season	
	1924	10-year average	8-year average	
	bush. lb.	bush. lb.	bush. lb.	
Ploughed 3 inches deep	5 ..	22 42	55 18	
" 4 "	9 20	24 5	58 27	
" 5 "	10 ..	23 25	57 ..	
" 6 "	8 ..	22 50	54 32	
" 7 "	7 20	23 9	54 21	
" 8 "	6 40	22 17	54 31	
" 5 " and subsoiled 4 inches	6 40	23 49	57 19	
" 6 " " 4 "	6 10	23 28	56 29	
" 7 " " 4 "	7 40	24 13	57 28	
" 8 " " 4 "	4 30	22 52	52 7	

With soil and climatic conditions such as prevail at Scott neither deep ploughing nor subsoiling of summer-fallow seems advisable. The first three plots listed in the table above, ploughed three, four and five inches deep, are ploughed the same depth for the second crop after fallow, while all other plots are ploughed five inches deep for the second crop. In some types of soil there may be a danger of a hard formation at the sole of the furrow, when ploughing is done at the same depth continuously, but this has not been true in this experiment where the three plots referred to have been ploughed the same depth for ten years.

OTHER SUMMER-FALLOW TREATMENTS

A nine-year test in ploughing summer-fallow on May 15, June 15 and July 15 shows the May-ploughed fallow to give an average annual increase over the June ploughing of 2 bushels 41 pounds per acre, while the June ploughing gave an increase of 2 bushels 21 pounds per acre over the July ploughing—a difference of 5 bushels 2 pounds per acre between May and July ploughing of summer-fallow for wheat.

Over a period of nine years the seeding of one-half bushel of oats per acre in early June on freshly ploughed fallow and pasturing with sheep during the late summer has resulted in a decrease in wheat of 3 bushels and 24 pounds per acre. It has not proven profitable to cultivate the stubble or plough shallow in the fall previous to summer-fallowing.

An experiment has just been started in which the fallow is not ploughed but is simply cultivated early in the summer and cultivated as necessary during the remainder of the season. The first crop following this treatment will be in 1925.

SUMMER-FALLOW SUBSTITUTES

Experiments in summer-fallow substitutes have been conducted since 1922. The first yields following the various fallow substitutes were obtained in 1923. In the table below the two-year average and the 1924 yields are shown.

SUMMER-FALLOW SUBSTITUTES

Treatment given	Yield per acre Wheat			
	1924		2-year average	
	bush.	lb.	bush.	lb.
Wheat following—Corn	8	5	27	37
" Bare summer-fallow	7	20	22	10
" Oats in double rows	5	20	27	5
" Oats in triple rows	5	10	27	50
" Potatoes	5	..	22	55
" Wheat in double rows	3	55	22	32
" Barley in triple rows	3	45	23	7
" Wheat sown in block	3	20	..	..
" Barley in double rows	3	15	25	32
" Wheat in triple rows	2	10	21	35
" Sunflowers	2	5	26	2

Some of the 1924 yields in this experiment would scarcely justify the harvesting under field conditions, but this was done for comparative purposes. The comparatively low average yield on summer-fallow is due to the small yield which was secured in 1923. Further tests are necessary before deductions can be made from the summer-fallow substitute work conducted at this Station.

STUBBLE TREATMENT

In addition to the treatments listed below ploughed land was harrowed to make a satisfactory seed bed.

STUBBLE TREATMENT

Plot	Treatment given	Yield per acre, Wheat			
		1924		Nine-year average	
		bush.	lb.	bush.	lb.
1	Ploughed in fall 4 inches deep	2	20	16	46
2	Disked in fall	5	40	19	32
3	Stubble burned in fall—disked	4	10	20	45
6	Ploughed 4 inches in spring	4	50	21	38
5	Stubble burned in spring—seeded at once	4	30	23	28
14	Stubble cultivated shallow in fall	5	10	..	..
15	Stubble cultivated deep in fall	6	50	..	..
16	Seeded in spring without cultivation	failure		..	..

The highest average yield was obtained by seeding immediately after burning in the spring, without ploughing. However, a perfect burn was obtained by covering the ground with straw, which would not be feasible on a large area. The stubble was from the first crop following a well-prepared summer-fallow which left the ground in a mellow condition and made it possible to cover the seed to a satisfactory depth without any previous cultivation. This experiment does not justify "haphazard" methods of "stubbling-in" on land polluted with weeds or grass or following a second or third crop after summer-fallow. Plot 16 was seeded in stubble without any preparation or burning and resulted in an absolute crop failure. It is evident from the yields shown above, resulting from the various treatments, that the safest general practice is to plough in the spring. There are no average yields available for last three plots in the table.

SPRING VS. FALL PLOUGHING AND DISKING STUBBLE AT CUTTING TIME

Disking at cutting time has not been justified. It will be noted from the table, comparing plots 9 and 10, that spring ploughing has given a higher yield than fall ploughing. The depth of ploughing was four inches in every case.

SPRING VS. FALL PLOUGHING AND DISKING STUBBLE AT CUTTING TIME

Plot	Treatment given	Yield per Acre Wheat			
		1924		Nine-year Average	
		bush.	lb.	bush.	lb.
7	Disk at cutting time—plough in spring	6	..	20	1
10	Plough in spring	6	10	21	32
8	Disk at cutting time—plough in fall	4	40	18	33
9	Plough in fall	5	10	18	53

STUBBLE TREATMENT FOR OATS

In 1924, the spring cultivating gave the highest yields but the ten-year average shows the spring ploughing to be the most satisfactory method of preparation.

Plot	Treatment given	Yield per acre Oats			
		1924		Ten-year Average	
		bush.	lb	bush.	lb.
11	Ploughed 4 inches in autumn	7	2	45	9
12	Ploughed 4 inches in spring	18	28	52	32
13	Cultivated in spring	20	20	31	12

SEEDING TO GRASS AND CLOVER

Due to the extreme drought during the summer of 1924 very little growth was made on the hay plots. The mixture of seed used in this experiment has been 10 pounds of western rye grass and 6 pounds of sweet clover per acre. The experiment has indicated that the most profitable way to seed down is with a light nurse crop rather than by seeding alone. The first crop of hay is heavier when seeded alone but does not offset the value of the nurse crop. The seed is mixed with the grain and seeded with the ordinary grain drill.

BREAKING SOD

An experiment covering a period of eight years comparing several methods and dates of breaking shows that it is more profitable to break early in June and keep cultivated during the summer than to break after hay is cut, even though backsetting is done late in the fall. Breaking in the spring and seeding at once has not been satisfactory.

APPLYING BARNYARD MANURE

In this experiment the rate of application has been 12 tons per acre. A spreader has been used which spreads evenly and breaks large lumps. Where a spreader is not used the breaking up and scattering may be effectively done by using a drag harrow previous to ploughing.

MANURE TO AFFECT WHEAT

Plot	Second Crop after Summer-fallow	Yield per Acre, Wheat			
		1924		Ten-year Average	
		bush.	lb.	bush.	lb.
1	Fresh manure on fall ploughing in winter	..	50	18	36
2	Fresh manure on stubble in winter previous to fallow	2	..	19	6
3	Rotted manure after seeding second crop after fallow	1	10	20	11
4	Rotted manure after seeding first crop after fallow	2	20	20	39
5	No manure—fall ploughed for second crop	4	20	19	3
6	Rotted manure before fall ploughing	11	40	24	58
7	Rotted manure before spring ploughing	13	10	27	31
8	No manure—stubble disked before fall ploughing	7	50	22	12
9	No manure—stubble burned before fall ploughing	10	40	22	58

Plots 1 to 6 inclusive received the same treatment excepting the kind of manure and time of applying. Plot 5 is the check and shows that no increase in yield has been gained by plans followed on plots 1 and 2 in the use of fresh manure. It should be stated that the plots on which fresh manure was applied are invariably more weedy than where rotted manure is used. This is due to the viable seeds in the fresh manure. The weed seeds and grain of different kinds found in the manure are destroyed in the rotting. It would also appear that under the dry conditions prevailing at Scott that there is not sufficient moisture in the soil to rot the manure satisfactorily, but when the manure is well rotted previous to applying, the yield shows an increase.

The practice followed at this Station in rotting the manure is to place a pile in a low place in a field. The team is driven over the top of the pile with each load, which keeps the pile well packed. One pile is made each year and one is spread on the land each year. The pile made in 1922 was used in 1924, thus necessitating three piles. In this way sufficient time is allowed for rotting and no fresh manure is mixed with the rotted and no viable weed seeds or grain are scattered on the fields in the manure.

On plots 8 and 9, no manure was used but the stubble was disked on plot 8 and burned on plot 9 before fall ploughing, and when compared with plot 5, which received the same treatment excepting the treatment of the stubble, an increased yield is shown in favour of the burning or disking of stubble previous to fall ploughing. However, a higher yield was obtained on plot 7 on which the stubble was left untouched until spring and rotted manure was applied just before ploughing.

MANURE TO AFFECT BARLEY

Plot	Second Crop after Summer-fallow	Yield per Acre Barley	
		1924	Eight-year Average
		bush. lb.	bush. lb.
1	Fresh manure on fall ploughing in winter	13 36	27 16
3	Rotted manure after seeding second crop	2 34	22 2
5	No manure—fall ploughed for second crop	3 16	20 17
6	Rotted manure before fall ploughing	5 30	29 16
7	Rotted manure in spring ploughing	10 40	31 11
8	No manure—stubble disked before fall ploughing	6 42	23 18
9	No manure—stubble burned before fall ploughing	8 12	26 29

Rotted manure after seeding has not given as high an average yield of barley as fresh manure applied in winter on fall ploughing. Disking or burning the stubble, as on plots 8 and 9 previous to fall ploughing, has given higher yieds than ploughing the stubble down untouched as on plot 5. Of the fall-ploughed plots, rotted manure applied before ploughing has given the highest yield, but plot 7 manured before spring ploughing has given still greater yields. The 1924 yields are rather irregular and difficult to explain. The deductions are based on the nine-year average.

MANURE TO AFFECT OATS

Plot	Second Crop after Summer-fallow	Yield per Acre Wheat
		Eight-year Average
		bush. lb.
1	Fresh manure on fall ploughing in winter	62 6
3	Rotted manure after seeding second crop	51 8
5	No manure—fall ploughed for second crop	52 19
6	Rotted manure before fall ploughing	60 25
7	Rotted manure before spring ploughing	66 19
8	No manure—stubble disked before fall ploughing	56 26
9	No manure—stubble burned before fall ploughing	60 7

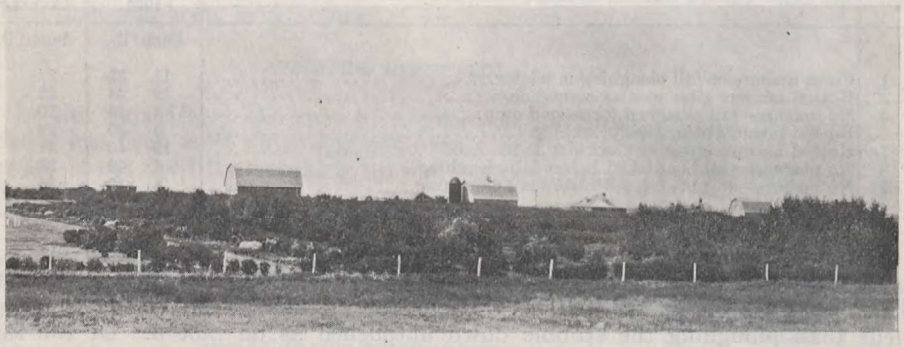
The eight-year average shows the highest yield of oats to have resulted from the same treatment which gave the highest yields of wheat and barley, as shown in the previous tables.

GREEN CROPS PLOUGHED UNDER

Since 1915 an experiment has been conducted for the purpose of determining the value of green crops ploughed under in the summer-fallow year as compared with the application of rotted barnyard manure. The average yield for ten years of the wheat crop on summer-fallow shows a decrease in yield resulting from ploughing peas under as compared with a bare summer-fallow. The application of rotted barnyard manure has increased the yield by 4 bushels and 11 pounds per acre as compared with the bare summer-fallow. More recently, sweet clover has been included in the green crops ploughed under but has not as yet affected the yields.

HORTICULTURE

The horticultural work of the Station attracts considerable attention from visitors and the increase from year to year in the number of home-gardens in the district has been very encouraging.



Arboretum and buildings, Scott, Saskatchewan.

As a result of a heavy September frost in the autumn of 1923 followed by a mild winter, there was considerable winter killing among the spireas, willows and cross-bred apple trees. All other ornamental, shade and fruit trees wintered in excellent condition.

The first vegetable seed was sown on April 22. The supply of moisture was not sufficient to insure good germination. Owing to the dry season, the soil gradually dried out and growth was somewhat checked, greatly reducing the yields. The rains of August and September helped late-maturing vegetables.

VEGETABLES

In the tests of vegetables this year, seed sold in Western Canada has mainly been used. In addition, some strains of seed grown at the Scott Station and on the Central and other Experimental Farms have been tested.

ASPARAGUS

This is the first vegetable of the season and very easily grown. Edible shoots were cut May 31 and the plantation continued to bear shoots of excellent quality until July 2.

ARTICHOKES

Tubers of Jerusalem artichokes were planted May 13 and harvested October 7. They gave a yield of 13,503 pounds per acre and while a number of the tubers were unshapely, the cooking tests proved them to be of good quality.

STRING BEAN

Variety Tests.—Twenty-seven varieties were tested. Half of each plot was harvested when ready for use and the remainder left to ripen for seed. These were destroyed by a frost on September 13 before the seed had matured. As in previous years, Callenge Black Wax was the first variety to be fit for use, but proved rather tough as well as a low yielder. The varieties to be recommended are Extra Early Valentine and Masterpiece.

Distance of Spacing.—The seed was spaced 2, 4 and 6 inches apart in the rows. The results were in favour of the six-inch spacing, while in the more favourable growing season of 1923, the best results were obtained from closer planting.

BEET

Test of Varieties.—Fourteen varieties were grown. The best varieties for table use were Black Red Ball (P. Wright), Crosgy Egyption (McKenzie), and Detroit Dark Red (Ottawa).

Dates of Seeding.—Commencing with April 22, seed of the Detroit Dark Red variety was sown and following at 10-day intervals. Fifty per cent of the early seedings of April 22 and May 2 were destroyed by frost. The seeding on June 22 was destroyed by drought. The highest yield was obtained from the May 22 seeding. The deduction drawn from this and previous seasons' date of seeding tests would indicate that about the middle of May is a safe time to sow beet seed.

CARROT

Test of Varieties.—Eleven varieties were grown. All did exceptionally well and were of excellent quality. The highest yielding varieties were Improved Danvers, Oxheart and Chantenay.

Dates of Seeding.—A date of seeding experiment, to determine the variation in yield of carrots seeded at various times, was continued this year. The first sowing was done April 22, using the Chantenay variety, and six late sowings at ten-day interval between each seeding. The highest yield was obtained from the sowing in the second week of May.

CAULIFLOWER

Six strains and varieties of cauliflower were started in the hotbed and transplanted to the open on June 9. As a result of the August rains, all varieties grew well, forming nice heads. A variety of Autumn Giant produced good cutting heads as late as October 3.

CAULIFLOWER—TEST OF VARIETIES

Variety	Seedsman	Weight, Ten Average Heads		Remarks
		lb.	oz.	
Snowball	McKenzie	23	8	Medium flavour and texture.
Snowball	Graham	20	..	" "
Early Snowball	Steele Briggs	20	..	" "
Autumn Giant	Carter	15	8	" "
Select Dwarf Erfurt	Steele Briggs	15	..	" "
Extra Early Erfurt	McDonald	12	8	" "

CABBAGE

Test of Varieties.—Seventeen varieties were sown in the hotbeds on April 22 and transplanted to the open on June 10. The recommended varieties in order of earliness are Golden Acre (Harris), Jersey Wakefield, Copenhagen Market, Enkhuizen Glory, Kildonan and Danish Ballhead. The last named is a good winter cabbage for storing. For a pickling red cabbage, Danish Red Stonehead was grown.

Dates of Seeding.—Two varieties, Copenhagen Market and Ex. Amager Danish Ballhead, were sown in the garden at six different dates commencing April 22. The first two seedings were destroyed by frost but the third and fourth seedings gave a fair yield.

CHINESE CABBAGE

Two chinese varieties of cabbage, Wong Bok and Pe Tsai, were sown on June 12. Although not forming a head the leaves were used as greens. When cooked, both varieties proved to be very tender and of mild flavour.

CELERY

Twelve varieties were grown. The growth was retarded by the drought of the early part of the season, but the August and September rains resulted in good yields being obtained. Several methods of blanching were tested. The hilling up with soil proved the most effective. The highest yields were obtained from Paris Rose Ribbed and Golden Heart.

CELERIAC

Large smooth Prague gave good results and it is quite equal to salsify for flavouring soup. This vegetable appears to be more suited to this district than salsify.

CORN

Seventeen early varieties or strains of corn were planted in hills May 22. On several of the later-maturing, the grain had only reached the milk stage when the crop was destroyed by fall frost. The varieties recommended in order of earliness are: Pickaninny A (Scott), Assiniboine (Scott), Assiniboine Red (Scott) and Howes Alberta Flint.

CITRON

The seed was sown in the garden on June 6. Due to the dry weather it did not emerge until August 9, and as a result no fruit formed.

CUCUMBERS

Seven varieties of cucumbers were sown but on account of the drought the crop was a failure.

EGG PLANT

The Extra Early Dwarf variety was started under glass and transplanted to the open June 14. Owing to the shortage of moisture the plants made very little growth and no fruit fully matured.

LETTUCE

Seventeen varieties were sown May 13 but the seed germinated unevenly. The earliest variety, Tom Thumb, was ready for table use July 19. From the standpoint of yield and quality combined the following varieties are recommended: Iceberg and Denver Market.

ONION

Twelve varieties were sown April 22. The best yielding varieties were Yellow Globe Danvers and Large Red Wethersfield.

Dutch sets were again planted and divided into three groups according to size. The larger set gave the greatest yield.

PEPPERS

Four varieties of peppers were tested. Due to the dry weather no pods ripened.

PARSLEY

The variety Triple Curled was grown. It made strong growth and was of excellent quality.

PARSNIP

Eight varieties of parsnip were grown. The variety Hollow Crown gave the highest yield. Seeding parsnips at ten-day intervals during the spring months was tried. The results confirm those of the previous season that the earliest seeding produced the best returns, while the late seeding (June 12) produced an unprofitable crop.

PEA

Forty-five varieties of pea were sown May 9. Half of each plot was harvested green, the remainder allowed to ripen and threshed for seed. The yield was below the average of recent years. The best yielding early, medium and late maturing varieties are given in order of yield in the table following:—

PEAS—TEST OF VARIETIES

Variety	Seedsman	Ready for use
Early—		
Little Marvel	Scott	July 19
Early Morn	Scott	" 15
Eight Weeks	Scott	" 11
Thomas Laxton	McDonald	" 18
Medium Season—		
Quite Content	Carter's	" 30
Champion of England	Steele Briggs	" 29
Gregory Surprise	Scott	" 16
Homesteader	Scott	Aug. 1
Late Maturing—		
Danby Stratagem	Graham	" 6
Potlach	Scott	" 1
Western Beauty	Scott	" 1
Duke of Albany	McKenzie	July 26

PUMPKIN

Five varieties were grown. The seed was sown in hills in the open June 6. A fine crop of pumpkins was harvested from the following: Connecticut Field (Scott) and Small Sugar (McKenzie).

POTATO

Thirty-five varieties were under test. They were planted May 19 and dug September 23. Since the establishment of the Station a great number of varieties and strains of potatoes have been tested. From year to year the less promising varieties have been discarded due to various causes, the more common being poor cooking qualities, lack of trueness to type, deep eyes, and high percentage of small potatoes. A number grown in the district could well be replaced by more suitable sorts, and it is to be hoped that the variety tests now carried on will tend to bring about standardization of the varieties, as well as the introduction of good seed, and so improve the quality of the potatoes now grown in northwestern Saskatchewan.

Approximately half of the varieties tested this year were introduced in 1922, so that only three years' averages are available except for those listed in the following table:—

POTATO—TEST OF VARIETIES

	Yield of Marketable	Yield of Unmarketable	Total Yield	Small	Average Yield of marketable Potatoes for Eight Years
	Bush.	Bush.	Bush.	Bush.	Bush.
Gold Coin	201·6	3·6	205·2	1·8	262·8
Carman No. 1	177·8	4·6	182·4	2·5	254·3
Prince Albany	152·2	2·8	155·0	1·8	251·8
Wee MacGregor	203·5	2·8	206·3	1·4	247·7
Dreer Standard	199·8	14·2	214·0	6·6	245·9
Empire State	198·0	4·6	202·6	2·3	242·4
Everitt	172·3	6·3	178·6	3·5	219·1
Irish Cobbler	143·0	3·5	146·5	2·4	217·6

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, the source of the seed is of prime importance. Wee MacGregor is very much in demand partly because it gives a high percentage of large to medium size potatoes.

Sprouting Seed.—To obtain new potatoes for use in the summer, two or three weeks earlier than can be obtained by the ordinary method of planting, the practice of sprouting the seed is very satisfactory. This is done by selecting medium-sized potatoes and placing them one layer deep in a light part of the cellar, or in a room or building that is frost proof, the beginning of April. On account of the light, sprouts develop and when these are planted about the middle of May they grow so rapidly that new potatoes are usually ready for use about ten days ahead of similar potatoes unsprouted. In 1924, potatoes sprouted in this manner were ready August 19, while those taken direct from the bins and planted were not ready before August 30.

RADISH

Eleven varieties of radish were sown on May 9, but all were destroyed by frost on May 23. A second sowing was made but, owing to the dry season, the radishes were of strong flavour.

KOHL-RABI

Two varieties were sown in the hotbed on April 12 and transplanted June 10. This vegetable is only suitable for table use for a short period as the flavour soon becomes strong and the texture coarse.

RHUBARB

Five varieties of rhubarb are grown. One of the most promising varieties being Ruby raised from a selection of seed by the Central Experimental Farm. The stalks are sweet-flavoured and of a rich strawberry colour. Our results have demonstrated that the cheapest and most certain method of maintaining a plentiful supply of rhubarb is to start it from seed every two or three years.

Rhubarb for Winter Use.—In the autumn, after the stalks have died, the roots can be dug up and exposed to the weather for two or three weeks, after which when covered with soil in a cellar, stalks shoot forth in about a month. Another method is to cover with cut straw, but when this is used artificial watering is essential.

SQUASH

Five varieties were grown. The seed was sown in hills in the open June 6. A fair crop of squash was harvested from the following: Early Mandan (Will's) and Early Prolific (Steele Briggs).

TURNIP

Two varieties of swede turnip were grown. The yields obtained from a row 33⅓ feet long were: Canadian Gem Swede (Steele Briggs) 149 pounds and Northwestern Purple Top (McKenzie) 149 pounds.

TOMATO

Twenty-eight varieties were started under glass April 12 and transplanted June 13. The dry season severely checked the plants and delayed the setting of the fruit. Due to the cool nights very little fruit ripened outside. Bonny Best (Stokes) gave the highest yield of green tomatoes with Alacrity (C.E.F.) a close second.

Ripening of Green Tomatoes Indoors.—This can easily be accomplished by packing in single layers between prairie wool and storing in a warm room. Records kept of the quantities stored and ripened shows a loss of ten per cent. In all cases the fruit has been carefully picked over each week.

VEGETABLE MARROW

Two varieties were grown. The seed was sown in hills in the open June 6. A fair crop of marrows were harvested from both the English Vegetable and Long White Bush variety.

SOWING VEGETABLES IN THE FALL

With a view to determine the possibilities of earlier vegetables, a number of seeds were sown in the autumn of 1923 to compare with early spring sowing of 1924. The table following gives the comparison:—

FALL SOWN VS. 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	Northern	Destroyed by frost.	Destroyed by frost.	..	..	..	..
Lettuce	Hanson	"	July 15	..	..	..	15
Radish	Scott	"	Destroyed by frost.	..	..	..	..
Carrot	Cantenay	Aug. 12	Aug. 14	12	2	13	..
Parsnip	Hollow Crown	End of season	End of season	18	8	20	14
Beet	Detroit Dark Red	July 23	July 28	16	15	36	10
Spinach	Victoria	June 12	June 18	2	4	2	..
Cabbage	Danish Ballhead	Destroyed by frost.	Destroyed by frost.	..	..	..	..

It will be noted that the fall-sown vegetables were ready for use earlier than the spring-sown but slightly heavier yields were obtained from the spring seeding.

VEGETABLES RECOMMENDED FOR NORTHWESTERN SASKATCHEWAN

In view of the keen interest taken in vegetable gardening as shown by the increased number of inquiries received at this Station it was thought that a chart showing the varieties of staple vegetables recommended for northwestern Saskatchewan would be of great value. The chart following gives the recommended varieties, as determined by tests for the past 14 years at Scott.

Name of Vegetable	Quantity of Seed Required	When to Plant or Sow	Average Time Required for Seed to Germinate	When to Plant in the Open	When Ready for Use	Varieties Recommended
Asparagus roots				Early spring	Second year.	
Asparagus seed	½ oz. produces 1,000 plants.	Early spring	About 6 weeks		Third year	Colossal.
Beets	1 oz. to 50-foot row	Month of May	12 to 14 days		End of July	Detroit Dark Red, Crosby's Egyptian, Early Model, Black Red Ball, Crimson Globe.
Beans	½ lb. to 75-foot row	First week of June	About 7 days		Middle of August.	Wardwell Kidney Wax, Extra Early Valentine, Masterpiece, Pencil Pod Black Wax, Stringless Green Pod, Davis Wax.
Cabbage (early)	1 oz. produces 1,500 to 2,000 plants.	Start in hotbed second week of April.	About 6 days	First week in June	End of July	Jersey Wakefield, Copenhagen Market, Golden Acre.
Cabbage (late)	1 oz. produces 1,500 to 2,000 plants.	Start in hotbed third week of April.	About 6 days	First week in June	Middle of August.	Kildonan, Glory of Enkhuizen, Brandon Market, Succession.
					In the fall	Danish Ballhead.
Cauliflower	1 oz. produces 1,500 to 2,000 plants.	Start in hotbed second week of April.	About 6 days	First week of June	End of July	Early Snowball, Extra Early Erfurt.
Cucumbers	2 pkts. to 50-foot row	First week of June	About 7 days		End of August	Early Russian, Davis Perfect, Imp. Long Green, Giant Pera.
Corn (table)	½ lb. for 75 hills	Latter part of May	About 11 days		Middle of August.	Pickaninny, Squaw, Howes Alberta Flint.
Carrot	½ oz. to 50-foot row	Second week of May	About 12 to 15 days.		Beginning of August.	Chantenay, Garden Gem, Improved Danvers, Half Long, Oxheart, Half Long Scarlet Nantes.
Celery	1 oz. produces 2,000 to 3,000 plants.	Start in hotbed beginning of April.	About 12 to 15 days.	First week of June	In the fall	Giant Pascal, Paris Rose Ribbed, Golden Self Blanching.
Lettuce	½ oz. to 50-foot row	About middle of May and intervals if desired.	About 10 to 15 days.		Middle of July	Iceberg, Denver Market, New York, Hanson, Duke of Cornwall.
Onion (seed)	½ oz. to 50-foot row	Third week of April	About 3 weeks	In the fall	In the fall	Australian Brown, Yellow Globe Danvers, Large Red Weathersfield, Improved Large Red.
Onion (sets)	1 lb. to 40-foot row	Third week of April	12 to 14 days		Middle of September.	Yellow Dutch.
Parsnip	½ oz. to 75-foot row	Second week of May	About 15 days		In the fall	Manitoba Intermediate, Hollow Crown, Elcombe's Giant, Guernsey.
Parsley	½ oz. to 40-foot row	Latter end of May	About 2 weeks		End of August	Moss Curled, Triple Curled.
Pea	½ lb. to 50-foot row	Second week of May	About 15 days		Middle of July	Thomas Laxton, Gradus, Stratagem, Little Marvel, Eight Weeks, Gregory Surprise.

Peppers	1 pkt. to 75-foot row	Start in hotbed second week in April.	About 10 days	First week of June	In the fall	Harris' Earliest Neapolitan.
Potatoes	1,000 to 1,350 lbs. per acre.	Middle of May	About 3 weeks		Early—Middle of July.	Everitt, Early Ohio.
					Late—End of August.	Gold Nugget, Gold Coin, Wee MacGregor.
Pumpkin	1 oz. to 25 hills	Second week of June	About 10 days		In the fall	Connecticut Field, Small Sugar.
Radish	½ oz. to 50-foot row	Beginning of May	10 to 12 days		Middle of June	Early Scarlet Ball, Early Scarlet White Tipped Icicle, Twenty Days, French Breakfast.
Spinach	1 oz. to 50-foot row	Latter end of May	About 10 days		Beginning of July.	Victoria, New Zealand, King of Denmark.
Swiss Chard	1 oz. to 50-foot row	Latter end of May	About 10 days		Middle of July.	—
Squash Vegetable Marrow.	1 oz. to 30 hills	Early part of June	About 10 days		Middle of August.	English Vegetable Marrow, Long White Bush.
Squash (winter)	1 oz. to 30 hills	Early part of June	About 10 days		In the fall	Green Hubbard, Early Mandan, Prolific Golden Hubbard.
Turnip	½ oz. to 75 feet	Latter end of May	About 7 days		Middle of July	Early Snowball, Early Milan, Purple Top Swede.
Tomatoes	1 oz. produces 1,000 to 1,500 plants.	Start in hotbed second week in April.	About 8 days	Middle of June	Middle of August.	Alacrity, Crimson Canner, Bonny Best, Red Head, Chalks Early Jewel, Burbanks Early, John Baer Sunrise.
Rhubard	1 oz. to 75-foot row	Latter part of April	12 to 15 days		Second year	Victoria.

TREE FRUITS

APPLES.—Very little progress can be reported with the growing of apples as a considerable number of trees were badly winter killed. This was the result of a heavy September frost in the autumn followed by a mild winter. From the standpoint of hardiness, the Osman cross-bred is outstanding. The fruit produced this season was large and well coloured.

PLUMS.—The Manitoba native plums continue to thrive. The yield was not as heavy as in previous years, this being the result of a heavy frost at blossoming time. The cultivated varieties of Sapa and Opata plums were winter-killed. The winter killing was possibly due to a severe frost in early September followed by a mild winter. The Rocky Mountain, or Sand Cherry, came through the winter in excellent condition and was heavily laden with fruit. The fruit is much larger but similar to the Choke cherry in flavour. During the past winter all the 1923 new growth was frozen back on the Compass cherries.

SMALL FRUITS

The yields were much lighter this year than last as the weather was unfavourable when the fruit was setting.

CURRANTS.—The black, white, and red currants were not so productive as in previous years. Although the growth of the wood was strong and vigorous, the berries were small, due to the prolonged dry weather.

RASPBERRIES.—All varieties came through the winter in good shape, but the unusually long period of drought prevented the fruit from setting.

STRAWBERRIES.—The strawberry varieties, all came through the winter in excellent shape. The plants gave promise of a good crop, but as a result of the dry weather, no fruit was picked.

FLOWERS

ANNUALS.—One hundred and twenty-two varieties of annual flowers were grown. Several were started under glass the middle of April and transplanted to the flower bed June 16. The dry weather at the time of transplanting greatly handicapped the young plants but by continued cultivation a good display of bloom continued until late in the autumn.

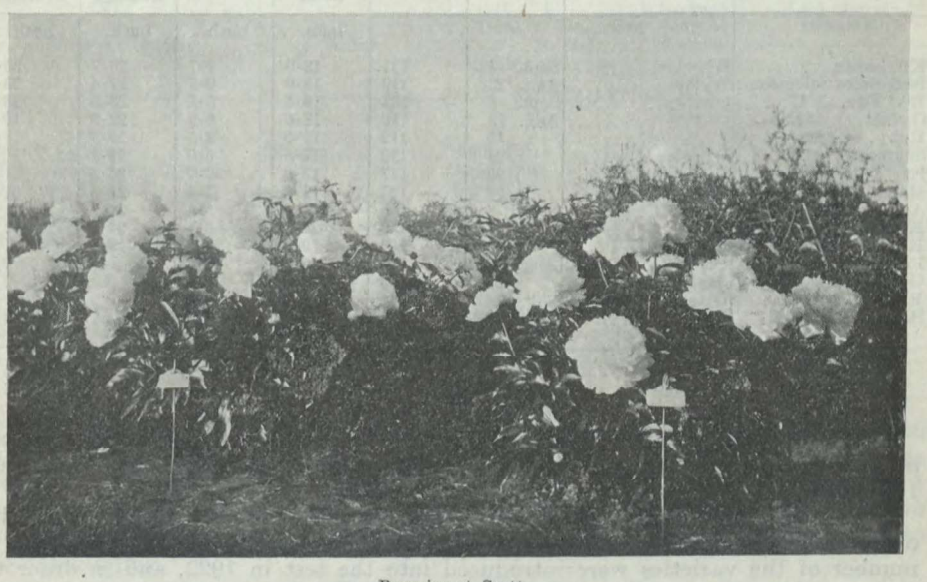
PERENNIALS.—The perennials, or herbaceous plants, did not give a continuance of bloom from spring until fall as has been the case in former years. Pæonies made a splendid showing, the fourteen different varieties giving a display of bloom from the middle of June to the middle of July. Some observations from the past dry season are: *Delphinium* (perennial larkspur) and *Lychnis chalcedonica* (Jerusalem Cross) suffered severely while Achillea (The Pearl), *Aquilegia* (Columbine), *Gypsophila paniculata* (Baby's Breath), *Hemerocallis* (Day Lily), *Helenium Hoopesii* (Sneeze Weed), *Papaver nudicaule* (Iceland poppy), *Papaver orientale* (Oriental poppy) bloomed profusely.

BULBS.—During the past two seasons when planting in the fall, the soil has been very dry. This has greatly checked the growth and the tulips have been dwarf-like in appearance.

INDOOR BLOOM FOR WINTER.—Bulbs of narcissus, hyacinth and tulip when planted in flower pots in the autumn will give a succession of bloom during

the winter months. A satisfactory method is to place them in the cellar after potting and cover the pots with soil until the bulbs germinate. The following are recommended:—

Hyacinths.—La Grandesse, Moreno, Gigantea, Grand Lilac.



Paeonies at Scott.

Narcissus.—Sir Watkin, Madame de Graaff, Emperor, Empress.

Tulips.—Duchesse de Parma, Artus, Chrysolora, Pottebakker White, Pottebakker Scarlet, La Reine.

CEREALS

The variety tests were sown in duplicate on summer-fallow land. One-fortieth-acre plots were used in each case. The spring season was unusually cool and all cereal crops were damaged on May 20 by thirteen degrees of frost. The yields are low, owing to the prolonged drought which commenced on June 15 and continued unbroken until July 25. The rains following this dry period did not appear to influence the yields of the later-maturing varieties of wheat but considerably helped the yields of the later-maturing varieties of other cereals.

WHEAT

Fifteen varieties or strains of spring wheat were tested. The plots were seeded on April 25 and April 26 at the rate of 1½ bushels per acre. It will be noted in the table following that the number of days required for the wheat to mature varied from 110 to 138. A number of the wheats have been grown for a sufficient length of time to permit a six-year average. Where a two-year average is not shown, the variety was introduced this season.

WHEAT—TEST OF VARIETIES

Name of Variety	Source	Date of ripening	Number of days maturing	Average length of straw including head	Yield of grain per acre		
					1924 yield	Two-year average	Six-year average
				inch.	bush.	bush.	bush.
Kitchener	Wheeler	Sept. 4	131	18·0	7·7	26·7	25·1
Red Bobs Selection	Wyler	Aug. 22	119	18·0	9·9	27·4	23·6
Red Fife, O. 17	Ottawa	Sept. 6	133	19·5	5·8	23·3	23·4
Garnet, O. 652	"	Aug. 13	110	18·0	6·9	22·3	19·3
Ruby, O. 623	"	" 15	112	18·0	8·3	20·8	17·6
Supreme	Wheeler	" 23	120	17·5	6·0	29·2	.....
Early Triumph	"	" 20	117	17·0	9·0	26·6	.....
Marquis 10B	"	" 29	125	19·0	7·4	24·3	.....
Acme, Sask. 450	Sask.	Sept. 8	135	25·0	5·4	24·1	.....
Kubanka, Sask. 6	"	" 11	138	25·5	3·1	21·9	.....
Kota	Brandon E. F.	" 3	130	19·0	7·2	19·0	.....
Producer, O. 197	Ottawa	Aug. 19	116	15·0	10·3	.....	.....
Golden	Sask.	" 27	123	19·0	8·4	.....	.....
Reward, O. 928	Ottawa	" 14	111	19·0	9·2	.....	.....
Brownie, O. 491	"	" 16	113	16·5	7·1	.....	.....

OATS

Ten varieties of oats were seeded May 2. The rate of seeding was 2¼ bushels per acre for all varieties excepting the hulless, which were seeded at the rate of 1¼ bushels.

Three of the varieties of oats have been tested for ten years and it will be observed that Banner has given the highest average yield for that period. A number of the varieties were introduced into the test in 1922, and in order to compare them from a yield standpoint with some of the older varieties, a three-year average yield is given in the table. New introductions this season were: a strain of Banner from the University of Saskatchewan, and Laurel, a hulless variety, from the Central Experimental Farm, Ottawa.

OATS—TEST OF VARIETIES

Name of Variety	Source	Date of ripening	Number of days maturing	Average length of straw including head	Yield of grain per acre		
					1924 yield	Three-year average	Ten-year average
				inch.	bush.	bush.	bush.
Banner, O. 49	Ottawa	Aug. 19	109·0	24·0	21·1	58·8	66·41
Victory	.....	" 23	113·0	23·0	24·3	58·5	65·91
Gold Rain	.....	" 17	107·0	22·0	23·1	61·0	65·47
Gerlach	Sask.	" 21	111·0	24·0	25·9	59·7	.....
Leader	McFayden	" 20	110·0	23·5	22·9	56·0	.....
Longfellow, O. 478	Ottawa	" 14	104·0	24·0	20·3	51·9	.....
Alaska	.....	" 1	91·5	23·5	12·3	39·6	.....
Liberty (hulless), O. 480.	Ottawa	" 7	97·5	26·0	12·6	36·0	.....
Banner, Sask. 144	Sask.	" 19	109·0	24·0	18·7	.....	.....
Laurel (hulless), O. 477.	Ottawa	" 10	100·0	24·0	14·4	.....	.....

BARLEY

Tests were made of eleven varieties of barley. All varieties were seeded May 9 at the rate of 2 bushels per acre excepting the hulless, which were seeded at the rate of 1¾ bushels.

Five of the varieties have been grown for a sufficient length of time to give the average yield for a number of years. For the four-year period Bark's Excelsior has given the highest yield, with Himalayan, a hulless variety, second.

BARLEY—TEST OF VARIETIES

Name of Variety	Source	Date of ripening	Number of days maturing	Average length of straw including head	Yield of grain per acre	
					1924 yield	Four-year average
				inch.	bush.	bush.
Bark's Excelsior	Ottawa	Sept. 18	132	17·0	10·14	31·4
Himalayan (hulless), O. 59	"	Aug. 12	95	17·0	9·73	28·9
Duckbill, O. 57	"	Sept. 24	138	21·0	12·71	28·1
O.A.C. 21	O.A.C.	" 10	124	19·0	4·41	27·9
Chinese, O. 60	Ottawa	" 10	124	19·5	4·27	25·3
Hannchen, Sask. 229	Sask.	" 9	123	18·5	15·66	.....
Junior, O. 471	Ottawa	Aug. 12	95	16·0	12·83	.....
Trebi	Lacombe E. F.	" 23	106	15·0	12·73	.....
Feeder, O. 561	Ottawa	" 27	110	19·0	12·35	.....
Bearer, O. 475	"	Sept. 20	134	25·0	10·39	.....
Keystone, Sask., 228	Sask.	" 11	125	18·5	3·66	.....

FLAX

Three varieties of flax were seeded May 9 at the rate of about half a bushel per acre. Approximately 50 per cent of the crop was damaged by frost when cut. The variety Crown was introduced in 1922, and as a result, a three-year average is listed so that it can be compared with the other varieties which have been grown for eight years. The yields are all low and no variety appears to be outstanding.

FLAX—TEST OF VARIETIES

Name of Variety	Source	Date of ripening	Number of days maturing	Average length of pod	Yield of grain per acre		
					1924 yield	Three-year average	Eight-year average
				inch.	bush.	bush.	bush.
Novelty, O. 53	Ottawa	Sept. 30	144	15·0	5·8	8·0	8·3
Premost	Steele Briggs	" 30	144	14·0	5·6	7·7	8·1
Crown	Sask.	" 30	144	14·5	7·32	8·4	.....

FLAX AND WHEAT IN COMBINATION FOR GRAIN

An experiment has been conducted during the past two seasons to find out whether flax and wheat in combination would give yields of greater value than when each is grown separately. Several seedings were made each year varying the proportions of wheat and flax. The results so far are not promising. The wheat gave about an average yield, while in no case did any of the flax sown reach maturity.

SPRING RYE

Prolific spring rye was sown May 3 and matured in 113 days. The yield was 19·9 bushels per acre, with an average yield for six years of 32·3 bushels per acre.

EMMER

Early Emmer, Ottawa 44, was sown May 3 and matured in the same number of days as the spring rye. The yield was 5·7 bushels per acre with an average yield for three years of 19·5 bushels per acre.

The Emmer was outyielded by the spring rye by 14·2 bushels per acre and over a period of three years by 11·7 bushels per acre.

PEAS

Five varieties were under test. These were seeded at the rate of 2 bushels per acre. On account of the impurity of one of the varieties it was not included in the table following. It will be noticed that the two introductions of this season gave the highest yields per acre. In the six-year average Golden Vine, Sask. 625, a selection made by the University at Saskatoon, has outyielded Chancellor by 2 bushels, but this difference cannot be considered significant.

PEAS—TEST OF VARIETIES

Name of Variety	Source	Date of ripening	Number of days maturing	Average length of pod	Yield of grain per acre	
					1924 yield	Six-year average
				inch.	bush.	bush
Golden Vine, Sask. 625	Sask	Aug. 14	103	1·85	2·2	15·3
Chancellor, O. 26	Ottawa	" 8	97	1·65	2·0	13·3
Cartier, O. 19	"	" 21	110	2·0	9·7	.....
Mackay, O. 25	"	" 26	115	2·2	8·3	.....

FORAGE CROPS

The experimental work with forage crops consisted of testing out varieties of corn, sunflowers, field-roots and hay crops.

CORN

Twenty-three varieties of corn were tested. These were sown May 22 in rows 30 inches apart on land which had been summer-fallowed the previous season. They were cut for ensilage on September 10.

On account of the cool spring followed with a long period of drought the yields of corn were extremely low. In some instances the crop was scarcely worth cutting, but this was done for purposes of comparison.

The yields given in the following table are for green fodder weighed as cut and only the varieties which have been grown for the past two years are listed.

CORN FOR SILAGE—TEST OF VARIETIES

Name of Variety	Source	Height	Stage of Maturity	Average yield per acre	
				1924 yield green weight	Two-year average
		inch.		tons	tons
Comptons Early	J. O. Duke	22	Early tassel	1·72	8·04
Longfellow	"	23	Tasseled	1·28	7·11
North Western Dent	Brandon E. F.	29	Early silk	2·53	6·98
Wisconsin No. 7	J. Parks	20	" tassel	0·96	6·47
Leaming	"	16	"	0·96	6·46
White Cap Yellow Dent	Steele Briggs	17	"	1·00	6·23
Golden Glow	J. O. Duke	17	"	1·06	6·01
North Dakota	Steele Briggs	21	"	1·61	5·84
Quebec 28	MacDonald College	25	Tasseled	1·28	5·72
Wisconsin No. 7	J. O. Duke	17	Early tassel	1·09	5·48
Leaming	"	21	"	1·28	4·98

SUNFLOWERS

Ten varieties or strains of sunflowers were seeded on land similar to that planted to corn varieties. They were sown May 17 in rows 42 inches apart. As evidenced by the growth, sunflowers seemed to stand the cool season much better than the corn and even appeared to benefit more by the rains which came the last week of July. It will be noted from the following table that the dry-matter yield per acre varies considerably, and as it is tonnage that is required, the variety giving the greatest tonnage of dry matter to the acre is desirable.

SUNFLOWERS—TEST OF VARIETIES

Name of Variety	Source	Average Height of Crop	Average Stage of Maturity	Yield per acre	Per cent Dry Matter	Yield per acre Dry Matter
				tons		tons
Mammoth Russian	K. McDonald	41	No blossoms	7·69	19·78	1·52
Russian Giant	Dak. I. S. Co.	45	"	8·42	15·13	1·27
Black Russian	C.P.R. Farm	41	52% blossom	7·20	17·60	1·27
Manchurian	McKenzie	43	77% "	7·55	16·18	1·22
Mixed	C.P.R. Farm	40	59% "	6·57	16·05	1·05
Manteca	"	37	58% "	5·08	15·90	0·81
Mennonite	Rosthern	27	100% "	3·60	17·51	0·63
Manchurian	C.P.R. Farm	42	55% "	7·37	.....	.....
Mammoth Russian	"	41	42% "	7·18	.....	.....
Ottawa No. 76	C.E.F.	41	57% "	6·23	.....	.....

FIELD CROPS OF CORN AND SUNFLOWERS

Two varieties of sunflowers were grown on summer-fallow land, the area in each case being 1·43 acres. Both were given the same treatment as to cultivation. The Russian Giant yielded 7·19 tons per acre, while the yield of the Manchurian was 5·93 tons or 1¼ tons less per acre. Another field summer-fallowed in 1923 had one acre seeded to Russian Giant sunflowers and one acre seeded to North Western Dent corn. Both crops were given the same cultural treatment. The sunflowers yielded 6·69 tons per acre and the corn 2·7 tons per acre.

FIELD ROOTS

As in 1923, the experimental work with roots consisted of testing certain varieties advertised by different commercial seedsmen as well as strains grown at the Central Experimental Farm and branch Farms to determine their value to farmers in this district, their trueness to type, and the dry-matter yield per acre. Duplicate plots were planted and the varieties tested were as follows: turnips 27, mangels 28, sugar beets 8, and carrots 14. When a five-year average of these tests is available it is proposed to publish the results.

ANNUAL HAY CROPS

A number of annual hay crops were tested for production. These tests consisted of a comparison of peas and oats with oats, spring rye, Hubam clover, Hungarian millet and Sudan grass. Duplicate test plots of each were seeded June 5 on summer-fallow land.

The spring rye was greatly benefited by the late rains of July and as a result a second crop was cut. The yields in tons dry matter per acre were as follows: oats, 1·62; peas and oats, 1·41; spring rye, 1·41; millet, 0·83; Hubam clover, 0·79; and Sudan grass, 0·11 tons. It should be stated that in previous tests the peas and oats mixture has always outyielded the oats.

DATES OF SEEDING OATS FOR HAY

The objects of the experiment are to determine the best time to seed oats and how late same may be seeded.

The seeding is commenced about the middle of May and continued until the second week in July. The plots are sown at the rate of 2½ bushels per acre and cut when the oats are turning. In the first year of the experiment the seeding was done in intervals of two weeks, the second year every ten days and the third year every week.

The results to date indicate that seed sown after June 20 is not likely to reach the turning stage before being frosted, and in cases where considerable acreages are sown, if damaged by frost, difficulty may be experienced in curing the crop.

VARIETIES OF OATS FOR HAY

Oats being the staple crop for hay purposes in northwestern Saskatchewan, a number of varieties were again seeded and cut for hay at various stages of growth, the objects being to compare the different varieties for hay and ascertain the best stage to cut the crop for this purpose. At the time of preparation of this report chemical analyses were not available.

VARIETIES OF PEAS FOR ANNUAL HAY

Four varieties of peas were cut when the peas were filled and forwarded to the Division of Chemistry at Ottawa for chemical analysis. When a three-year average of these tests is available it is proposed to publish the results.

PERENNIAL AND BIENNIAL HAY CROPS

Crop	Rate of Seeding	When Sown	Yield per Acre, 1924		
			Green Weight	Dry Matter	Dry Matter
	lb		tons	Per cent	tons
Western rye grass	14	1923	2·34	69·46	1·63
Brome grass	14	1923	2·04	54·90	1·12
Western rye and brome	7 and 7	1923	2·24	61·97	1·39
Sweet clover	10	1923	3·12	30·81	0·96
Western rye and sweet clover	8 and 10	1923	2·82	.....	.....

A comparative test of the most popular kinds of perennial and biennial hay crops in 1924 shows that western rye has outyielded either brome or a combination of brome and western rye.

Mixtures of western rye and sweet clover in different proportions have been sown; 8 pounds of western rye and 10 pounds of sweet clover gave the highest returns.

WESTERN RYE GRASS

Twenty-one strains of western rye grass were sown June, 1922, in rows 36 inches apart. The plots were divided at cutting time, one-half was cut for hay and the other half for seed.

The results of a few of the leading strains are given in the following table:—

STRAINS OF WESTERN RYE GRASS

Strains	Yield per Acre, 1924			
	Green Weight	Dry Matter	Dry Matter	Seed
	tons	Per cent	tons	lb.
No. 4	3·20	57·32	1·82	391
" 81	2·99	59·64	1·48	54
" 10	2·34	61·46	1·44	89
" 98	2·10	61·14	1·28	72
" 6	2·09	57·05	1·19	267
" 5 (Grazer)	1·99	56·19	1·12	284
" 89	1·99	60·36	1·20	71

SWEET CLOVER FOR SEED

In 1923 five plots were sown in rows at distances of 6 inches, 12 inches, 24 inches and 36 inches apart. The plots of sweet clover winter-killed to such an extent that results are not comparable.

ALFALFA FOR SEED

The yields per acre from three plots sown in rows at 24 inches, 30 inches and 36 inches apart were 50, 60 and 80 pounds respectively. Unless seeded in rows and intertilled, alfalfa is uncertain as a seed-crop.

POULTRY

One of the foremost objects in the poultry work at this Station is to develop a good laying strain. But one breed is kept, the Barred Plymouth Rock, as representing the utility breeds. Other lines of work receiving special

The brooder house at Scott.

study are the testing of feeds, methods of feeding and, in addition, attempting to solve numerous local problems of artificial incubation and rearing.

By the continued use of trap-nests the identity of eggs from the highest producing hens has been maintained. Just before hatching the marked eggs

in the incubators are placed in wire baskets where the chick is confined until wing banding is done. This procedure makes it possible to pedigree the chicks and improve the flock very quickly by eliminating all progeny of low producers.

From approximately 250 adult females maintained on the plant the egg production has been as follows:—

YEARLY EGG PRODUCTION

Year	1921-22	1922-23	1923-24
November	808	889	1,256
December	1,084	1,443	2,694
January	1,651	1,794	1,307
February	980	1,171	1,938
Four month total	4,523	5,297	7,195
Total for year from flock	20,841	25,374	28,743
Total for year from 25 best birds	3,625	4,750	4,900
Average per bird (25 best)	185	190	196

The highest producer raised on the plant to date completed her pullet year October 31, 1924, with a record of 260 eggs in 338 days. This is not an extremely high record but shows progress.

STORING AND PACKING EGGS FOR WINTER USE

Various experiments have been conducted at this Station in packing and storing eggs in summer when prices are very low with a view to keeping the eggs as fresh as possible until the time of scarcity and high prices during the winter months. The results thus far indicate that "water glass" is the safest material to recommend for keeping a reasonable number of eggs for winter use. Lime water is cheaper than water glass and usually highly satisfactory but it is not a standard product and if an inferior quality of lime is used disastrous results may follow.

If eggs are to be stored in large numbers in summer for winter market the commercial cold storage may be made use of to good advantage. Eggs were sent to a cold storage plant in Saskatoon during the summer of 1924 but will not be sold until after the new year. During the previous year two 30-dozen crates were sent to the cold storage plant at different dates. The comparative figures follow:—

COMMERCIAL COLD STORAGE

—		Crate No. 1	Crate No. 2
Dates stored		Aug. 11	Aug. 24
Price of eggs per dozen when stored	cts.	17½	25
Total local value when stored	$	5 25	7 50
Express and storage charges	$	3 63	3 37
Local value in August plus charges	$	8 88	10 87
Price received in February sold as storage eggs at 40c	$	12 00	12 00
Net profit per crate	$	3 12	1 13

While the profit in this case is not great, very often the local price of eggs is much lower than mentioned above and in such cases the profits would be materially increased.

CORN VS. NO CORN IN RATION

Object.—To determine the profit in purchasing corn to feed pullets for egg production.

Fifty pullets were divided into two lots of 25 each. Both lots were weighed previous to the commencement of the experiment and at the conclusion. The corn replaced the grain in both the scratch grain and meal at the rate of 20 per cent. The experiment commenced on November 1, 1923, and continued to April 30, 1924.

CORN VS. NO CORN FOR PULLETS

Feed	Pen 1—No Corn		Pen 2—Corn	
	Number of pounds of feed	Cost	Number of pounds of feed	Cost
	lb.	$	lb.	$
Scratch grain	648	3·97	655	9·62
Meal mash	397	7·30	327	7·81
Green cut bone	29	0·87	29	0·87
Green feed	163	1·63	163	1·63
Grit	20	0·47	20	0·47
Oyster shell	16	0·34	16	0·34
Charcoal	6	0·42	6	0·42
Total feed and cost	1,279	15·00	1,216	21·16
Average cost per bird		0·60		0·84
Total egg production		1,695		1,728
Average egg production		67		69
		cts.		cts.
Total cost per dozen for eggs		10·6		14·6
		lb.		lb.
Increase in total weight of pens		12·5		19

This experiment indicates that it is not profitable to purchase corn for feeding pullets during the winter especially in northwestern Saskatchewan where corn is shipped in from a considerable distance, which means almost a prohibitive price. The experiment is being repeated during the winter of 1924-25.

HULLESS VS. COMMON OATS

Object.—To determine the profit in feeding hulless oats for egg production.

Fifty pullets were divided into two lots of twenty-five each. Both lots were weighed before the experiment was commenced and at the conclusion. The hulless oats replaced the common oats in the scratch grain and meal mixture pound for pound. The experiment commenced on November 1, 1923, and continued to April 30, 1924. The scratch grain consisted of 50 per cent wheat and 25 per cent barley and 25 per cent oats. The meal was oats exclusively with beef scrap.

HULLESS VS. COMMON OATS FOR PULLETS

Feed	Pen 5—Hulless Oats		Pen 6—Common Oats	
	lb.	$ cts.	lb.	$ cts.
Scratch grain	622	7·62	578	6 36
Oat chop	255	4·07	508	5 08
Green cut bone	30	0·89	30	0 89
Beef scrap	64	3·52	127	6 87
Sprouted common oats	162	1·62	163	1 63
Grit	20	0·49	22	0 54
Oyster shell	25	0·50	25	0 50
Charcoal	6	0·42	6	0 42
Total feed and cost	1,184	19·14	1,459	22 29
		Pen 5	Pen 6	
Average quantity of feed per bird lb.		47	58	
Average cost of feed per bird $		0·76	0·89	
Total egg production		1,688	1,557	
Average egg production		67	62	
Total cost per dozen cts.		13·6	17	
Increase in weight of pens lb.		21·5	18	

The use of hulless oats has increased the egg production by over 11 per cent and at the same time has reduced the cost of production by over three cents per dozen. This is such a striking difference that the experiment is being repeated in order to check the results of the first test.

BEES

In order to determine the possibilities of bee-keeping in this district, two colonies of bees were received from the Bee Division of the Central Experimental Farm, Ottawa, in May, 1923.

During the season of 1923, the total return amounted to 60 pounds of extracted honey. Three swarms were obtained and at the close of the season there were five colonies in good condition.

WINTERING

A syrup made from two parts of sugar to one part of water was fed the bees. An average of about 20 pounds per colony was used to furnish sufficient stores for winter. One colony was wintered in a cellar while four were wintered outside in a wintering case.

The wintering case was merely a rough box made large enough to accommodate four hives and leave a space on all sides of the hives to be packed with cut straw. The hives were also protected on top and bottom with the same material. A tunnel about one-half inch high was left at the openings.

In the spring of 1924 one of the colonies wintered outside was dead. This was the result of some of the bees drifting to the other colonies thereby not giving it sufficient strength to stand the winter. All other colonies came through in fair condition.

THE SUMMER'S RESULTS

When removed from the winter quarters, one colony was placed on scales and daily weighings made.

The colonies did not build up very rapidly on account of the cool spring but enough nectar was stored from fruit bloom to keep up brood rearing. On June 9, honey flow from Caragana started and for 19 days considerable nectar was stored from this source. The highest yield for one day was 9 pounds. About the middle of July, sweet clover and alfalfa commenced to bloom and furnished the greater part of the honey for the season. The fall flow from August 25 to September 18 was mainly from sweet clover and sunflowers.

The total production of extracted honey for the summer was 146.5 pounds. The greatest yield of honey from one colony was 90.5 pounds.