DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

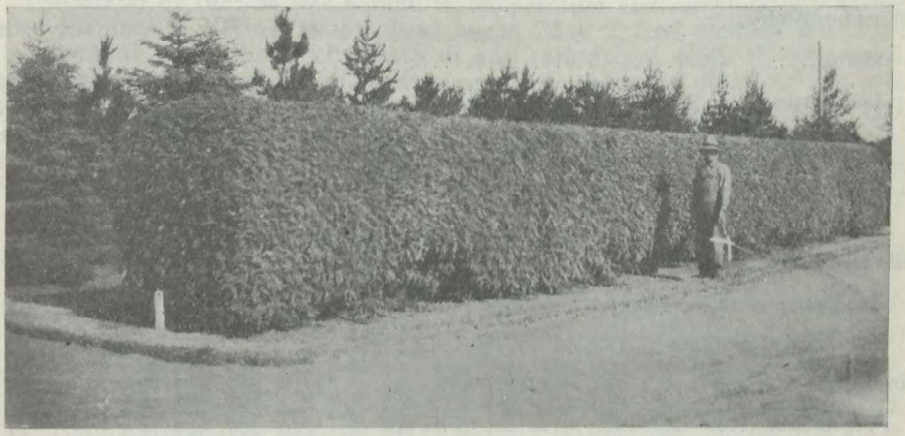
EXPERIMENTAL STATION

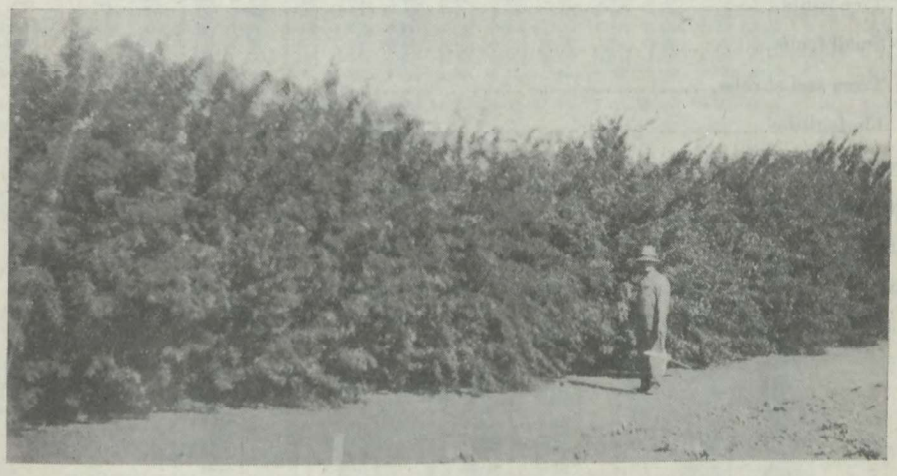
ROSTHERN, SASK.

REPORT OF THE SUPERINTENDENT

W. A. MUNRO, B.A., B.S.A.

FOR THE YEAR 1924





Caragana hedges twelve years after planting. (Above) trimmed, (below) untrimmed.

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

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REPORT OF THE SUPERINTENDENT, W. A. MUNRO, B.A., B.S.A.

SEASONAL NOTES

The winter of 1923-24 was normal in temperature and snowfall, and spring opened favourably. Work on the land began May 2, and seeding was done under favourable conditions. But lack of any rain except small showers until August 20 resulted in failure of many crops throughout the district. On this date, 2·16 inches of rain fell, which was too late for any of the grain crops and most of the fodder crops. Apart from this downpour, the precipitation for the five growing months, April to August, was 4·66 inches, as compared with an average of 9·36 inches for the previous thirteen years.

PRECIPITATION AT ROSTHERN, SASKATCHEWAN

—	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	Average for 14 years
January	0·22	0·30	0·55	0·65	0·60	1·00	0·95	1·40	0·75	1·20	0·65	0·25	0·56	1·05	0·81
February	0·80	0·30	0·50	0·00	0·50	0·08	0·90	0·40	0·15	0·20	1·40	0·16	0·13	0·95	0·46
March	0·15	0·60	0·35	0·55	0·00	0·70	0·35	0·35	1·60	0·85	1·60	0·35	0·80	0·35	0·62
April	1·00	0·67	0·27	0·63	0·30	0·69	1·21	1·65	0·37	0·60	2·22	0·44	0·66	0·75	0·81
May	2·38	2·15	1·26	1·96	1·22	2·49	0·32	1·26	0·36	1·32	1·88	3·66	1·59	0·70	1·61
June	3·55	2·81	1·87	2·00	1·00	2·15	3·42	0·93	2·28	1·25	1·49	1·54	3·59	0·87	2·05
July	2·89	5·25	3·80	1·40	3·12	3·66	1·16	2·50	1·05	2·53	4·91	0·53	3·52	0·77	2·65
August	1·79	2·15	3·59	1·12	0·28	2·45	1·94	0·42	1·48	1·67	0·64	3·28	2·67	3·73	1·94
September	1·81	2·76	2·89	0·97	1·07	0·68	0·64	0·23	2·79	1·59	3·34	1·31	1·15	1·27	1·60
October	0·00	0·22	0·29	1·57	0·32	0·81	0·75	0·34	0·55	1·60	0·30	1·19	0·23	1·85	1·64
November	1·20	0·82	0·34	1·20	0·95	0·20	0·13	0·30	0·40	0·18	1·59	0·05	0·19	0·95	0·60
December	0·85	0·50	0·00	0·52	0·82	0·15	2·70	0·55	0·20	0·30	0·45	0·35	0·15	0·20	0·55
Totals	16·64	18·53	15·71	12·57	10·18	15·06	14·47	10·33	11·98	13·29	20·47	13·11	15·24	13·44	15·34

METEOROLOGICAL RECORDS AT ROSTHERN, 1924

Month	Temperature °F.					Precipitation			Total sunshine	Evaporation
	Highest	Date	Lowest	Date	Mean	Rainfall	Snowfall	Total precipitation		
						inches	inches	inches	hours	inches
January	37·2	30	−40·8	15	9·75	.....	10·5	1·05	118·2	
February	42·1	12	−28·2	20	12·61	.....	9·5	0·95	114·2	
March	39·0	19	− 9·9	6	19·67	.....	3·5	0·35	153·2	
April	67·2	30	12·0	1	35·07	.....	7·5	0·75	220·5	
May	77·0	14	21·0	23	47·14	0·30	4·0	0·70	301·0	6·1
June	85·1	17	34·8	6	56·24	0·87	.....	0·87	297·5	4·9
July	91·2	6	38·0	13	65·39	0·77	.....	0·77	323·9	5·8
August	82·0	1	40·0	8	58·46	3·73	.....	3·73	237·1	3·3
September	87·9	5	27·0	27	53·24	1·27	.....	1·27	220·3	2·7
October	69·1	25	21·1	11	44·53	1·85	.....	1·85	154·3	
November	39·2	19	−17·4	13	18·06	0·80	1·5	0·95	65·8	
December	43·2	11	−40·5	16	−4·05	.....	2·0	0·20	95·1	
	.....	.....	.....	.....	.....	9·59	38·5	13·44	2,301·1	22·8

EXTREME HIGHEST, EXTREME LOWEST AND MEAN TEMPERATURES AT ROSTHERN, SASK., 1911-24

Month	1924			1923			1922			1921		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
January	37·2	−40·8	9·7	31·0	−32·2	− 1·8	36·6	−45·0	− 1·5	31·0	−28·9	5·2
February	42·1	−28·2	12·6	42·0	−39·9	0·0	22·6	−38·9	− 7·0	41·2	−32·9	9·0
March	39·0	− 9·9	19·6	41·2	−27·8	10·2	42·3	−20·1	15·9	41·9	−27·1	10·9
April	67·2	12·0	35·0	75·9	− 3·8	36·7	69·9	8·2	39·2	56·3	− 3·8	32·3
May	77·0	21·0	47·1	84·2	21·9	51·4	87·0	32·9	53·9	79·4	27·9	52·5
June	85·1	34·8	56·2	91·2	41·0	61·9	87·2	34·9	60·6	84·6	30·3	64·7
July	91·2	38·0	65·4	86·9	40·1	65·1	90·2	38·5	63·4	89·9	44·3	64·7
August	82·0	40·0	58·4	80·0	38·8	59·5	97·0	37·5	64·4	91·2	36·3	61·3
September	87·9	27·0	53·2	80·9	21·0	52·1	87·8	27·4	54·6	78·8	30·4	50·2
October	69·1	21·1	44·5	72·0	10·1	42·2	65·5	22·5	39·5	72·9	22·2	42·1
November	39·2	−17·4	18·0	59·4	− 5·0	27·5	48·9	− 5·0	27·0	46·4	−20·9	14·0
December	43·2	−40·5	− 4·0	43·2	−27·8	13·4	34·1	−30·1	− 0·5	35·5	−40·2	5·5

Month	1920			1919			1918			1917		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
January	31·8	−45·2	− 7·0	40·8	−29·3	11·2	31·0	−45·3	− 7·4	34·5	−38·0	− 9·2
February	39·9	−30·4	12·6	27·9	−44·8	− 2·2	37·0	−42·5	− 0·9	34·2	−44·8	− 6·9
March	39·8	−28·4	12·8	39·7	−33·5	6·3	53·2	−26·8	20·3	36·3	−34·0	14·0
April	49·8	−11·0	26·2	74·2	11·7	42·7	73·1	10·2	41·1	48·0	− 3·8	30·0
May	29·6	30·0	51·9	97·0	21·7	55·8	79·2	20·2	45·0	89·3	22·8	52·0
June	81·0	33·8	58·8	94·0	29·4	64·7	98·7	32·9	61·6	82·3	27·7	56·0
July	95·0	38·0	66·4	102·0	41·2	66·0	93·6	30·6	61·7	87·8	40·7	65·7
August	92·4	31·2	64·5	92·6	37·4	64·3	86·3	37·8	62·0	87·4	37·7	60·2
September	82·0	28·3	53·2	77·2	23·1	51·5	81·2	20·3	49·5	84·3	22·7	52·9
October	78·8	19·3	42·9	64·5	−11·8	26·3	68·8	5·3	40·1	66·9	− 3·1	33·7
November	46·8	2·4	24·4	43·3	−25·6	8·9	53·0	− 5·9	26·1	58·0	8·7	34·2
December	33·8	−20·8	9·9	39·7	−36·1	1·6	41·9	−27·3	12·4	18·7	−51·3	−14·5

Month	1916			1915			1914			1913		
	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean	Highest	Lowest	Mean
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
January	15·7	−59·3	−17·9	30·3	−45·5	0·2	35·5	−37·8	1·5	38·6	−49·5	−13·3
February	42·2	−35·2	2·4	29·0	−13·3	8·8	38·8	−47·6	−10·4	35·0	−34·0	− 0·6
March	37·8	−32·8	11·7	43·0	−14·8	17·7	38·0	−15·9	17·9	41·1	−33·8	4·2
April	72·3	− 2·6	36·7	71·3	13·7	44·6	69·1	5·3	35·8	73·9	14·8	40·4
May	79·2	18·1	46·4	78·8	23·4	51·2	80·1	22·2	49·8	78·7	22·1	46·3
June	74·6	29·5	55·7	81·0	24·2	54·7	84·2	33·3	58·7	85·7	35·0	59·2
July	87·2	43·4	64·8	84·2	35·8	58·5	93·8	41·2	67·5	84·1	39·7	59·4
August	82·5	30·4	58·5	93·6	31·2	64·2	87·0	32·8	60·0	82·1	39·7	60·0
September	77·2	22·2	49·6	79·1	11·8	46·2	79·3	30·1	50·9	84·3	29·7	56·6
October	64·8	9·6	36·2	67·1	19·4	40·6	81·2	16·7	42·5	69·0	0·7	32·1
November	50·0	− 5·3	23·8	47·5	−16·6	18·7	49·9	−20·0	21·7	52·9	− 3·9	22·4
December	37·1	−32·2	2·6	28·0	−20·5	6·8	23·8	−31·8	1·1	33·0	−21·8	12·6

Month	1912			1911		
	Highest	Lowest	Mean	Highest	Lowest	Mean
	°F.	°F.	°F.	°F.	°F.	°F.
January	34·4	−54·1	−12·5	22·9	−45·0	−17·2
February	39·3	−27·8	5·5	35·5	−30·8	− 3·0
March	40·4	− 4·4	4·0	40·9	−14·0	18·0
April	63·0	16·8	39·2	72·5	1·7	37·1
May	84·2	28·2	48·5	82·2	23·7	48·0
June	93·8	34·0	61·8	84·7	38·2	61·1
July	76·2	37·0	57·7	87·5	38·6	56·9
August	79·2	37·2	58·6	84·8	32·2	56·0
September	73·2	20·4	45·7	71·1	20·8	46·7
October	67·7	17·7	38·5	78·3	4·7	38·1
November	40·3	0·0	24·0	51·0	−28·1	9·1
December	38·8	−19·0	8·1	32·4	−42·8	6·4

ANIMAL HUSBANDRY

HORSES

The horses at this Station consist of eighteen draught horses of Clydesdale breeding and one driver. With the exception of two pure-bred Clyde mares, they are all grades. The horses are kept chiefly for work on the various departments of the Farm.

The horses have been kept in good health and in excellent working condition throughout the year on a ration consisting of western rye grass hay, whole oats and bran. Bran is substituted for one-half the oat ration at nights and on Sundays. Roots or potatoes are fed twice a week throughout the year, which helps to keep the animals in a thrifty condition. The grain ration is reduced one-half in the autumn and winter after the busy season is over. Any idle horses in the winter are turned out into a large field every day.

BEEF CATTLE

STEER-FEEDING EXPERIMENT

Due to limited facilities and to the prominence given to the Holstein dairy herd in the past, no breeding beef cattle work has been conducted at this Station and beef-raising operations are of necessity limited to steer finishing in winter. To utilize the large amount of hay, ensilage and turnips grown at this Station every year, over and above what is used for the breeding stock, for nine years of the past ten years steers have been purchased in the autumn and sold in the spring, and for eight of these years they have sold at a profit after allowing for the outside market prices for feeds. The steer feeding work during the winter of 1923-24 has been much the same as that carried on at Rosthern in former years for the purpose of strengthening and verifying results previously obtained.

Object of Experiment.—1. To compare the feeding value of sunflower ensilage with turnips for fattening steers. 2. To ascertain the cost of finishing beef under present-day conditions, and to determine whether winter steer feeding is profitable.

Experimental Methods.—Forty-two steers of grade Shorthorn breeding, one-and-a-half, and two-and-a-half years old, and twenty steers of grade Aberdeen-Angus breeding, one-and-a-half years old, were purchased at Winnipeg in November, 1923, at a net cost of $2,685.46, plus $234.18 expenses. They were tuberculin tested, and three reacted. These were subsequently slaughtered. One was found only slightly infected, and the carcass sold for $22.80, while the other two carcasses were condemned. After the steers reached the Farm they were dehorned and turned out into the stubble fields for two weeks. They were brought into the buildings on November 19, divided into three lots and weighed.

Lot 1, consisting of nineteen two-and-a-half year old steers of grade Shorthorn breeding, was fed oat and barley chop, sunflower silage, oat straw and western rye grass hay.

Lot 2, consisting of ten one-and-a-half year old steers of grade Shorthorn breeding, and ten one-and-a-half year old steers of grade Aberdeen Angus breeding was fed similar feeds to lot 1.

Lot 3, consisting of twenty steers similar to those in lot 2, was fed similar feeds to lots 1 and 2, except that they received sliced turnips instead of sunflower silage throughout the whole of the experiment.

All the lots received all the oat straw and western rye grass hay they would clean up. The meal mixture, consisting of oat and barley chop, was the same for all lots. The respective weights of the lots of steers at the beginning and at

intervals of one month during the test were used as a guide to the amount of silage and turnip ration for each lot.

At the start of the test the meal in all cases was ground oats with a gradual introduction of ground barley until at the end it was 4 parts barley to 1 of oats.

At the beginning, meal was fed at the rate of 5 pounds per steer per day, and increased on January 1 to 7 pounds; on January 28, to 9 pounds; and on March 4, to 12 pounds, which was continued to the end of the experiment.

Ensilage and turnips were fed at the rate of 15 pounds per day per one-thousand-pound steer from the beginning until January 1, when it was increased to 20 pounds and on March 4 to 30 pounds, which was continued to the end of the feeding period.

As in previous tests the steers were wintered in open corrals each 40 feet by 80 feet. A tight board fence 8 feet high around the corrals and a covering of poles and straw at one end for a length of 20 feet was the only protection afforded from the wind and snow.

The part of the corral under the shelter was kept dry and well bedded throughout the winter enabling the steers to lie down in comfort. Feeding was done in troughs and racks in the corral. The steers had access to water at all times and during the winter months tank heaters were used to keep the surface of the water free from ice. Block salt was kept before all lots constantly.

The following shows the items of cost of the steers on experiment:—

Initial weight 62 steers, 63, 187 lb.		
Initial cost at 4·25 cents per pound	$	2,685 46
Freight		156 19
Telegrams		1 34
Testing for tuberculosis		13 00
Travelling		63 65
Total	$	2,919 64
Three steers condemned—Less sale of meat		22 80
Total cost of three carloads	$	2,896 84
Total cost per pound 62 steers Winnipeg weight	4·584	cents
Total cost per pound 59 steers Rosthern weight	5·007	"

In this test the meal was valued at 1 cent per pound, sunflower ensilage at $3 per ton, turnips at $3 per ton, western rye hay at $8 per ton, and oat straw at $2 per ton.

Results.—The following table shows gains made, feed consumed, cost of feed and net profit, exclusive of labour on each lot:—

STEER FEEDING EXPERIMENT

—		Lot 1	Lot 2	Lot 3
Number of steers in lot		19	20	20
First weight Nov. 19, 1923	lb.	20,650	19,000	18,200
First average weight	"	1,087	950	910
Finished weight May 6, 1924	"	26,760	25,150	22,610
Finished average weight	"	1,408	1,257	1,130
Total gain in 169 days	"	6,110	6,150	4,410
Average	"	321	307	220
Average daily gain per steer	"	1·90	1·82	1·31
Amount of meal eaten	"	27,414	28,010	28,010
Amount of sunflower silage eaten	"	83,150	77,610	.....
Amount of turnips eaten	"	.....	.....	74,790
Amount of western rye grass hay eaten	"	13,580	14,350	17,960
Amount of oat straw eaten	"	21,330	16,490	27,570
Meal fed per lb. of gain	"	4·49	4·55	6·35
Ensilage fed per lb. of gain	"	13·61	12·62	.....
Turnips fed per lb. of gain	"	.....	.....	16·96
Western rye grass hay fed per lb. of gain	"	2·22	2·33	4·07
Oat straw fed per lb. of gain	"	3·49	2·68	6·25
Cost per 100 lb. gain	$	7·76	7·65	10·99
Gross cost of feed	"	474·52	470·40	484·69
Average cost of feed per steer	"	24·97	23·52	24·23
Total cost of steers at 5·007 cents	"	1,033·94	951·33	911·27
Total selling price at 6·445 cents	$	1,724·68	1,620·92	1,457·22
Average valuation per steer at start	$	54·42	47·57	45·56
Average sale price per steer at finish	$	90·77	81·05	72·86
Average increase in value	$	36·35	33·48	27·30
Profit over feed cost on group	$	216·22	199·19	61·26
Profit over feed cost per head	$	11·38	9·96	3·07

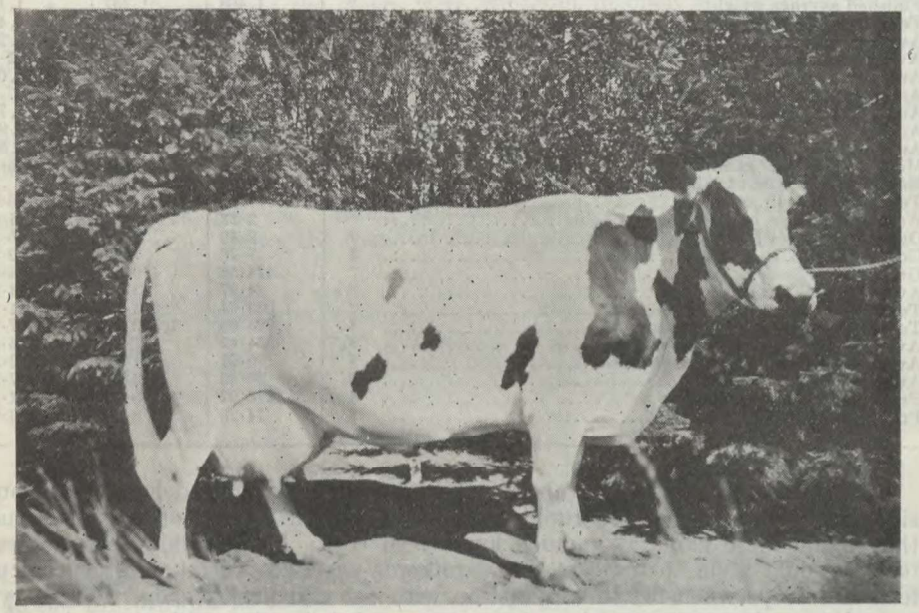
It will be noticed in the above table that the ensilage-fed lots made considerably greater and more rapid gains than the turnip-fed lot and also that they made these gains at a much lower feed cost. For fattening steers these results would seem to indicate that sunflower ensilage is a superior succulent feed to turnips when fed in conjunction with oat and barley chop, western rye grass hay and oat straw. A point not revealed in the table but observed throughout the feeding period was that lot 3 scoured more readily, and were more susceptible to digestive troubles than were lots 1 and 2, due, no doubt, to the extra succulence of the turnips as compared with sunflower silage, which may account, in part at least, for the low gains made by them in comparison with the silage-fed lots. It is noteworthy, also, that the thrifty appearance of the three lots of steers at the beginning was not nearly as well maintained by the steers receiving turnips as by those receiving silage and at the end of the feeding period a marked difference in the finish of the three lots of steers could be noted, the steers on silage being much more nearly finished than those on turnips.

According to the table these steers were all valued alike, when as a matter of fact lots 1 and 2 were really worth more than lot 3. When they were shipped they lost their identity and the exact difference in market value could not be determined. The cattle were exported with shipments from Experimental Farms at Scott, Sask.; Lethbridge, Alberta; and Lennoxville, Que., and marketed in Manchester, England. The average price received for the Rosthern shipment was 6.445 cents per pound, Rosthern weight. Their estimated value at Rosthern at time of shipment was 6 cents per pound. Details of the shipment are given in the Report of the Dominion Animal Husbandman for 1924.

DAIRY CATTLE

The dairy cattle on hand December 31, 1924, total twenty-three head. They consist of two mature bulls, fifteen cows and six heifers, all pure-bred Holsteins. There has not been the usual increase in the herd because, of the eight cows which freshened, only two gave heifer calves.

The two bulls at the head of the herd are Agassiz Sir Pietje—51064—and Inferno Woodcrest—35725—. The former, a splendid individual with high-producing ancestry, is showing his prepotency by producing offspring of excellent type, scale and quality. He is the sire of six promising heifers in the herd, four of which are bred to freshen in the summer of 1925. The other bull, a six-



R.E.S. Madrigal Gypsy Keyes, with a record of nearly 19,000 pounds of milk for each of two years.

year-old, was purchased in the fall to breed to the daughters of Agassiz Sir Pietje. He is sired by Inferno Rooker Vale—27080—and out of Ruby Nig—14213—that had a record of 560·2 pounds of milk and 25·62 pounds of butter in seven days as a four-year-old and 18,307 pounds of milk and 840 pounds of butter as a mature cow.

The average production of the ten cows finishing a lactation period within the calendar year 1924 was 13,018 pounds of milk and 502 pounds of fat for an average milking period of 431 days. Four mature cows completed 365-day R.O.P. records, averaging 12,765 pounds milk and 599 pounds of butter; while two two-year-olds averaged 9,917 pounds milk and 480 pounds of butter. At the present time eight cows and heifers are entered in the Record of Performance test and promise to make a creditable showing. During the year, seven promising young bulls were sold into various localities in Saskatchewan for breeding purposes. These bulls, all of excellent type and quality with good breeding back of them, should be a credit to the breed and an assurance of improved stock to the purchaser.

In November, 1924, the yearly test for accreditation was made and the herd again found free from tuberculosis.

FEEDING DAIRY COWS

In the winter, western rye grass and sweet clover hay, roots, ensilage made from corn and sunflowers, and meal make up the feed for the dairy herd. An average of 10 pounds of hay, 40 pounds of ensilage and 20 pounds of roots are fed each cow per day and she is given 1 pound of meal for each 3½ pounds of milk produced. Ensilage is fed twice daily, morning and evening, and the grain ration is fed at the same time. At noon a feed of roots and meal is given. Hay is fed twice daily. The meal mixture fed the cows consists of 300 pounds oat chop, 300 pounds bran, 200 pounds oil meal and 150 pounds barley chop. In the spring when the grass is well started, the cows are turned out to pasture. No roughage is fed during the spring and summer months. In the fall, to supplement the dry pasture, the soiling system is practised to a limited extent.

A statement of the production of each of the ten cows ending their lactation period within the calendar year 1924, together with amount of feed consumed and profit from each cow, is shown in tabular form.

Name of Animal	Number of lactation period	Number of days in milk	Total pounds of milk for period	Daily average yield of milk	Average per cent fat in milk	Pounds fat for period	Pounds butter for period	Meal at 1 cent per pound	Roots and ensilage at $5 a ton	Hay at $10 per ton	Straw at 10 cents per cwt.	Months on pasture at $2 per month	Total cost of feed for period	Total value of milk at $2 per hundred	Profit on product	Cost to produce 100 pounds milk
			lbs.	lbs.	p.c.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	months	$ cts.	$ cts.	$ cts.	$ cts.
R. E. S. Madrigal Gypsy Keyes	4	566	22,381·7	39·5	3·84	859	1,073·7	8,044	29,775	5,760	4,150	4·5	196 83	447 63	250 80	0 88
R. E. S. Johanna Keyes Lass	1	583	19,027·1	32·6	3·86	734	918·5	7,267	31,910	6,202	4,415	4·2	196 26	380 54	184 28	1 03
R. E. S. Sarcastic Sylvia	6	422	13,833·9	32·8	3·41	471	588·7	5,871	18,020	3,605	2,700	4·5	133 48	276 68	143 20	0 99
R. E. S. Madrigal Sylvia	5	378	12,994·4	34·4	4·42	574	717·5	4,911	16,070	3,195	2,440	4·5	116 69	259 89	143 20	0 89
R. E. S. Johanna Gypsy Keyes	3	424	12,549·0	29·6	3·86	484	605·0	5,023	18,395	3,660	2,750	3·5	124 27	250 98	126 71	0 99
R. E. S. Johanna Sylvia	3	395	11,685·0	29·6	4·26	498	622·5	4,234	18,470	3,635	2,730	3·5	116 41	233 70	117 29	0 99
R. E. S. Mechthilde Gypsy Keyes	1	327	9,820·9	30·0	3·58	351	438·7	3,842	12,298	2,970	1,980	4·25	94 50	196 42	101 92	0 96
R. E. S. Abbekerk Johanna Keyes	1	469	9,889·0	21·1	3·74	370	462·5	3,469	21,605	4,290	3,360	4·5	122 51	197 78	75 27	1 24
R. E. S. Abbekerk Madrigal Keyes	1	358	7,516·0	21·0	3·44	258	323·5	2,660	16,545	3,075	2,360	3·5	92 69	150 32	57 63	1 23
R. E. S. Sarcastic Mecbthilde	1	396	10,481·0	26·5	3·98	417	521·2	4,516	15,080	3,645	2,440	5·0	113 52	209 62	96 10	1 08

CORN SILAGE VS. HALF ROOTS AND HALF CORN SILAGE FOR MILK PRODUCTION

The object of this experiment was to determine the value of a combination of equal parts of corn silage and roots (mangels) as compared with corn silage alone for milk production.

Eight cows on test for Record of Performance, nearly all well advanced in their lactation period, were used in this experiment. The experiment was divided into three three-week periods and data were taken during the final week of eaeh period only, the first two weeks in each case being used as transition periods. The first and last periods were averaged, which average was directly comparable to the second period as it eliminated the natural decline in milk flow. The meal ration for each individual cow was kept the same throughout the experiment and they were all fed all the hay they would clean up.

The following is the succulent part of the ration fed daily to each cow during the last week of each three-week period:—

Period 1.—Corn silage, 60 pounds.
Period 2.—Corn silage, 30 pounds. Mangels, 30 pounds.
Period 3.—Corn silage, 60 pounds.

The following table gives the information secured:—

CORN SILAGE VS. HALF ROOTS AND HALF CORN SILAGE

—		Period 1, silage	Period 2 Roots and silage	Period 3, silage	Average of 1 and 3 silage
Number of cows in test	No.	8	8	8	8
Pounds of milk produced by 8 cows	lb.	1,419·5	1,412·0	1,370·9	1,395·2
Average milk per cow per day	lb.	25·35	25·21	24·48	24·91

It will be noted from the results given in the table that the gain in milk production in favour of the half roots and half corn silage ration over the straight silage ration is so trifling as to be only indicative. The difference is not large enough to be decisive and so does not show the superiority of one ration over the other.

SHEEP

Grade sheep of Leicester breeding are maintained at this Station. From a number of range-bred ewes purchased in 1915 there has been developed by the use of pure-bred Leicester rams, a uniform, high-grade flock. The number of breeding ewes is kept down to fifty and each year some of the ewes of less desirable type are discarded and replaced by the best of the ewe lambs, with the result that the characteristics of the original foundation ewes have entirely disappeared. The ewe lambs were not bred. The lambing results this year were quite satisfactory, as fifty-four lambs were raised from thirty-six ewes bred. The lambs came strong and no trouble was experienced from disease. The 1924 wool-clip was fifty fleeces, 484.5 pounds, or an average of 9.69 pounds per fleece.

The sheep were carried through the winter in splendid condition on a ration consisting of western rye grass hay, turnips and whole oats and bran. The grain mixture, three pounds of whole oats to one of bran, was fed at the rate of three-fourths of a pound per ewe per day. After lambing, the grain ration was increased to one pound per day. They were watered daily and had eonstant access to rock salt.

During the summer, the breeding flock had the run of a natural pasture with access to water, as in previous years. After threshing, the flock was turned into the stubble and root fields so as to flush the ewes preparatory to breeding and to keep the lambs gaining in weight. The rams were put in the breeding pens on November 8.

SWINE

Three breeds of swine, Berkshire, Tamworth, and Yorkshire, are kept at this Station. The Berkshire herd consists of six brood sows and one boar, the Tamworth herd of five sows and two boars, and the Yorkshire herd of five sows. Two of the Yorkshire sows in pig to a pure-bred Yorkshire boar were secured from the Farm at Lacombe in the fall of 1924 and the fourteen other sows have been bred to boars of the above-mentioned breeds. Next year it is proposed to continue feeding tests, comparing pure-bred Berkshires, Tamworths, and Yorkshires with cross-breds from these three breeds as to type and economy of gains and with a view to determining the value of cross-breeding for the production of market hogs. In all, twenty-five litters were farrowed during the year 1924 of which two were fall litters. Twelve Berkshire sows gave an average of 9·0 pigs per litter and raised an average of 7·3. Seven Tamworth sows gave an average of 9·6 pigs per litter and raised an average of 6·4. Six Yorkshire sows gave an average of 8·4 pigs per litter and raised an average of 5·8. Fourteen of the twenty-five sows had litters for the first time. The eleven mature sows dropped an average of 10·9 pigs per litter and raised an average of 8·0. The fourteen young sows dropped an average of 7·1 pigs per litter and raised an average of 5·0.

In the winter the sows were given the run of a large open yard for exercise with a straw stack for shelter, and a week after the spring litters were weaned, were carried through the summer on pasture with access to water. No meal was fed while on pasture.

Experiments were conducted during the past season with three objects in view, viz., a comparison of self-feeding, light and heavy meal feeding and feeding with a supplement to the check-ration as affecting gains and quality of carcass; a comparison of pastures; a comparison of skim-milk, tankage and a combination of tankage and oil meal as supplements to a check ration of shorts, oat chop and barley chop.

SELF-FEEDING, LIGHT AND HEAVY FEEDING ON PASTURES AND DRY LOT AND FEEDING WITH A SUPPLEMENT TO THE CHECK RATION ON PASTURE

Experimental Methods.—Pure-bred Berkshire, Tamworth, Yorkshire and crosses from these three breeds were selected. One hundred and thirty pigs representing the above breeds and crosses, as equally as possible, were divided into thirteen lots as follows:—

Lot 1.—Self-feeder on rape pasture.
Lot 2.—Heavy hand-feeding on rape pasture.
Lot 3.—Light hand-feeding on rape pasture.
Lot 4.—Heavy hand-feeding on oat pasture.
Lot 5.—Light hand feeding on oat pasture.
Lot 6.—Heavy hand feeding on barley pasture.
Lot 7.—Light hand-feeding on barley pasture.
Lot 8.—Light hand-feeding on oat and barley pasture.
Lot 9.—Light hand-feeding on oat and barley pasture.
Lot 10.—Heavy hand-feeding with buttermilk on corn pasture.
Lot 11.—Self-feeder in dry lot.
Lot 12.—Heavy hand-feeding in dry lot.
Lot 13.—Light hand-feeding in dry lot.

The pigs were of litters farrowed between March 29 and April 24 inclusive, and in making the allotment, an even distribution was made with regard to

age, weight, sex and general thrift. The handling of the pigs previous to the beginning of the test had been practically the same. As it was desirable to promote growth rather than finish, the ration to begin with consisted of three parts shorts and one part oat chop.

Shorts was gradually replaced by barley chop and the percentage of oat chop increased, but toward the finishing period the percentage of barley chop was increased and finally made up three-quarters of the ration. In addition to the meal ration, lot No. 10 was fed buttermilk at the rate of two pounds per pound of grain consumed. In order that the ration for each hand-fed lot could be calculated according to a standard of heavy feeding for each 100 pounds live weight, each lot was weighed at the commencement of the test, and every twenty-eight days during the test. For the first month of the experiment, $5\frac{1}{2}$ pounds of meal mixture per day were fed for every 100 pounds of live weight. As the pigs increased in weight the amount was decreased and throughout the finishing period $4\frac{1}{2}$ pounds per hundred pounds live weight apparently formed a satisfactory basis. The light feeding for the pigs on pasture was one-half and in the dry lot two-thirds that of heavy feeding. Owing to all pastures with the exception of corn becoming completely exhausted six weeks after the commencement of the test, the ration for each lot receiving light feed was increased and all lots shared equally per hundred pounds live weight. Each lot on pasture had the run of three-fourths of an acre and each lot in dry lot was confined to a corral 80 feet by 40 feet. A covering of poles and straw at one end of each corral provided protection against the sun and wind.

A grove of caragana afforded a satisfactory shade for lots on pasture. The meal was fed dry to all lots with the exception of lot 10. Lot 10 received the meal and buttermilk in the form of a slop. All hand-fed lots were fed three times daily. Each group had access to a constant supply of fresh water and to a mineral mixture of charcoal, hydrated lime, bone meal and salt. As the pigs reached a weight ranging between 170 and 220 pounds live weight, they were marketed and graded.

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		Lot 1 — Self-feeder rape pasture	Lot 2 — Heavy feeding rape pasture	Lot 3 — Light feeding rape pasture	Lot 4 — Heavy feeding oat pasture	Lot 5 — Light feeding oat pasture	Lot 6 — Heavy feeding barley pasture	Lot 7 — Light feeding barley pasture	Lot 8 — Light feeding oat and barley pasture	Lot 9 — Light feeding oat and barley pasture	Lot 10 — Heavy feeding corn pasture and buttermilk	Lot 11 — Self-feeder dry lot	Lot 12 — Heavy feeding dry lot	Lot 13 — Light feeding dry lot
Number of hogs in experiment		11	9	10	10	10	11	10	10	10	9	10	10	10
Initial weight, gross	Lbs.	349	282	321	330	318	329	329	311	301	234	242	255	304
Initial weight, average	"	31·7	31·3	32·1	33·0	31·8	29·9	32·9	31·1	30·1	26·0	24·2	25·5	30·4
Finished weight, gross	"	2,086	1,564	1,471	1,697	1,353	1,937	1,598	1,557	1,610	1,517	1,390	1,212	1,314
Finished weight, average	"	189·6	173·8	147·1	169·7	135·3	176·1	159·8	155·7	161·0	168·5	139·0	121·2	131·4
Number of days in experiment		146	146	146	146	146	146	146	146	146	124	146	146	146
Total gain for period	Lbs.	1,737	1,282	1,150	1,367	1,035	1,608	1,269	1,246	1,309	1,283	1,148	957	1,010
Average gain per animal for period	"	157·9	142·4	115·0	136·7	103·5	146·2	126·9	124·6	130·9	142·5	114·8	95·7	101·0
Average daily gain per animal	"	1·08	0·97	0·78	0·94	0·71	1·00	0·87	0·85	0·89	1·15	0·79	0·65	0·69
Amount of meal eaten by group	"	8,150	5,975	5,091	6,224	4,894	6,753	5,352	5,134	5,077	4,523	6,550	5,332	4,897
Amount of buttermilk consumed by group	"										8,944			
Amount of meal eaten per pound gain	"	4·69	4·66	4·43	4·55	4·73	4·19	4·22	4·12	3·88	3·52	5·70	5·57	4·85
Amount of buttermilk eaten per pound gain	"										6·97			
Total cost of feed	$	84 88	49 02	41 23	51 02	39 72	55 34	43 30	41 57	40 95	45 19	54 51	43 89	39 81
Cost of feed per head	$	7 72	5 45	4 12	5 10	3 97	5 03	4 33	4 16	4 09	5 02	5 45	4 39	3 98
Cost of feed per head per day	cts.	5·28	3·73	2·82	3·49	2·72	3·44	2·96	2·85	2·80	3·44	3·73	3·00	2·72
Cost to produce one pound gain	"	4·88	3·82	3·58	3·73	3·84	3·44	3·41	3·33	3·13	3·52	4·75	4·58	3·94

Cost of feeds:—Buttermilk, 1 cent per gallon; oats, 27 cents per bushel; barley, 37 cents per bushel; shorts, $21 per ton.

Deductions.—The results obtained from this test are in some respects in accord with those obtained from a similar test conducted the previous year. The pigs in the dry lot made low gains and required a comparatively large amount of grain for 100 pounds gain in weight as compared with the hogs on pasture.

On the average the pigs on pasture, not including lot 10, required 98·8 pounds less meal for each 100 pounds gain than those fed in dry lot, which means it cost 73·9 cents more per 100 pounds gain to feed inside. Furthermore, the pigs on the self-feeder and on heavy hand-feeding on pasture were, with but few exceptions, ready for market at six-and-a-half months of age weighing 170 pounds on the average, while those on the self-feeder and on heavy hand-feeding in dry lot weighed only 128 pounds on the average and were not up to market weight until five weeks later. It is noteworthy, also, that the lots on light hand-feeding on pasture averaged 0·17 pounds higher daily gains on 130 pounds less concentrates per 100 pounds gain than those on heavy hand-feeding in the dry lot. In addition to the small gains and the high cost of production as compared with the pigs on pasture, they were very uneven in size, unthrifty in appearance, and persisted in rooting up their lots. The figures in the accompanying table emphasize the importance of supplying pasture of some sort for the growing pigs.

When the average daily gains made by the lots on heavy hand-feeding on pasture excepting lot 10, and the lots on light hand-feeding on pasture are compared we find that the possibility of making good daily gains is reduced by the limited feeding of concentrates. The pigs on heavy hand-feeding average 0.15 pound higher daily gains at 0·2 cents a pound higher cost than the pigs on light hand-feeding. This apparent economy of gains made by the hogs lightly fed is offset by the small daily gains and consequent loss in profit due to late marketing. These results are somewhat different from those obtained in 1923. Throughout the experiment in 1923 it was observed that the pigs on pasture lightly fed took more exercise and apparently helped themselves to more of the green forage than the heavily-fed pigs on pasture, which resulted in more economical gains with the daily gains not reduced to any appreciable extent by the limited feeding of concentrates. In 1924 the difference in results may in part, at least, be attributed to the fact that the pastures became completely exhausted six weeks after the commencement of the test, whereas in 1923 the pastures provided ample forage to within a month of the completion of the test.

In comparing heavy hand-feeding with light hand-feeding in dry lot we find that the lightly-fed pigs average 0·04 pound higher daily gains at 0·64 cents a pound lower cost than the heavily-fed pigs. The reverse of this is generally true. The fact that lot No. 13 made greater and more economical gains may be explained in part, at least, when we note that these hogs appeared more thrifty throughout the test than the heavily-fed lot. The pigs in lot No. 12 were dry in the hair and developed very unevenly in size apparently owing to causes other than the method of feeding.

In comparing the results between the self-feeder on rape pasture, and the self-feeder in dry lot, we find the pasture lot to make 0.29 pound higher daily gains while consuming 1.01 less pounds of meal per pound of gain. The use of pasture not only resulted in higher daily gains and effected a greater saving in grain, but it had a very beneficial effect on the general health and thrift of the pigs. It is worth noting that the pigs on pasture were very smooth and uniform in degree of finish when marketed, whereas the pigs in dry lot were quite unthrifty in appearance and presented a great variation in size and finish at the close of the test.

It will be observed from the table that the self-fed hogs on pasture made the highest average daily gain of all the lots fed the basic ration, consumed the most grain and, taking an average, made 100 pounds of gain on less

feed than those hand-fed in dry lot and but slightly more than the hand-fed pigs on pasture. Furthermore, the self-fed hogs on pasture showed more uniformity of size and were more evenly fleshed than the hand-fed hogs at the end of the test. On the other hand, the hand-fed hogs were trimmer in appearance and more nearly approached the desirable bacon type than did the self-fed hogs.

The self-fed pigs in dry lot in some ways made the poorest showing of all the lots, making the fifth lowest average daily gains and requiring considerably more meal to make these gains than any of the other lots.

The accompanying table shows that while the feed requirement for 100 pounds of gain was fairly satisfactory in each lot, the average daily gains were too low. Perhaps the most interesting feature of the accompanying table is found in the consideration of lot 10 fed buttermilk in addition to the main ration. Lot 10 required the least amount of meal per 100 pounds of pork produced and made the greatest average daily gain. In addition, the buttermilk-fed hogs showed greater uniformity, were smoother in appearance, possessed more gloss in hair and were more evenly fleshed than the other lots. Perhaps some of the advantages apparently due to buttermilk were really due to corn pasture. The pasture on all other lots dried out early in the season whereas the corn remained green till cut down by frost on September 21.

These results would indicate that:—

1. The addition of buttermilk to the ration results in increased daily gains with the minimum of meal consumed.
2. Where no protein supplement was fed, daily gains were low and in the dry lot comparatively expensive.
3. The lots on a limited meal ration on pasture and the pigs in dry lot were slow in maturing, some not being up to market weight at eight months.
4. Pasture aids materially in pork production.
5. Hogs must be supplied with enough concentrates to keep them in a thrifty condition if they are to be marketed at 6½ to 7 months of age.
6. Self-fed hogs on pasture make higher daily gains and show greater uniformity than trough-fed hogs, but for the production of bacon carcasses self-feeding is less desirable than trough-feeding.
7. Corn pasture is more satisfactory than rape or grain in a dry season.

SKIM-MILK VS. TANKAGE VS. OILCAKE MEAL AND TANKAGE

Objects of Experiment.—1. To ascertain the profit in raising fall pigs. 2. To determine the relative value of digester tankage, skim-milk and a combination of equal parts of tankage and oilcake meal as supplements to a grain ration in feeding growing pigs during the winter months and in finishing pigs for the market.

Experimental Methods.—Thirty-six pigs were used in this experiment comprising twenty-five pure-bred Berkshires, ten Tamworth-Berkshire cross-breds and one pure-bred Tamworth. The pigs were of litters farrowed between August 19 and September 17, inclusive, and were divided into four lots of nine pigs each, as evenly as possible, as to size, type and general thriftiness. Previous to the beginning of the test, the feed and management of all pigs was practically the same.

The main ration for each lot to begin with consisted of equal parts by weight of ground oats and shorts. The shorts were gradually replaced by ground barley, and toward the finishing period the percentage of barley chop was increased and finally made up three-fourths of the ration. The meal was fed dry to all lots twice daily. At the commencement of the experiment all lots were fed the same amount of meal and shared a corresponding increase throughout the feeding period.

Lot 1 received eight per cent digester tankage.

Lot 2 received sixty pounds of skim-milk per day to drink instead of water.

Lot 3 received four per cent digester tankage and four per cent oil meal.

Lot 4 was used as a check lot and fed only the meal ration.

The shelter was made by using hurdles, and making a low framework 48 feet long, 12 feet wide and 3 feet high. The sides and ends were banked with straw and manure and hurdles placed around the outside to keep the straw and manure in place and to keep the pigs from climbing on top. This shelter was divided into four sections each with an opening to the south into a yard 36 feet long and 12 feet wide. The entire framework except the openings was covered with straw to a depth of 5 feet. Ample bedding was provided.

The pigs came through the winter free from ailments of any kind and were healthy at the end of the feeding period. A marked difference, however, in the thriftiness of the four lots of pigs could be noted at the finish. The skim-milk-fed lot possessed more gloss in hair giving them a more attractive appearance than the others, whose coats were coarse and curly; this being particularly true of the lot fed meal only. All lots finished as short, heavy, thickly fleshed hogs.

The following table gives the information secured:—

TANKAGE VS. SKIM-MILK VS. OIL MEAL AND TANKAGE

		Lot 1 tankage	Lot 2 skim-milk	Lot 3 Oil meal and tankage	Lot 4 meal ration only
Date placed on test		Dec. 1, 1923	Dec. 1, 1923	Dec. 1, 1923	Dec. 1, 1923
Date furnished		May 19, 1924	May 19, 1924	May 19, 1924	May 19, 1924
Number of days on feed		171	171	171	171
Number of pigs in lot		9	9	9	9
Average initial weight	lb.	44	44·9	44	45·3
Average final weight	"	194·4	225·0	195·5	171·1
Total gain during period	"	1,354	1,621	1,364	1,132
Average daily gain	"	0·88	1·05	0·89	0·66
Total grain fed per lot	"	4,980	4,980	4,980	4,980
Total supplement fed per lot	"	320	8,940	320	.....
Feed for 100 pounds gain—					
Grain	"	367·79	307·21	365·10	439·93
Tankage	"	23·63	.....	11·73	.....
Skim-milk	"	.....	551·51	.....	.....
Oil Cake Meal	"	.....	.....	11·73	.....
Cost of 100 pounds gain in weight	$	3·60	3·57	3·57	3·53
Cost of feed per head	$	5·42	6·43	5·42	4·44
Average initial value per pig at 5c. per pound	$	2·20	2·24	2·20	2·26
Total cost per head	$	7·62	8·67	7·62	6·70
Selling price per head at $6.25 per cwt	$	12·15	14·06	12·22	10·69
Average profit per head over feed cost	$	4·53	5·39	4·60	3·99

Prices charged for feeds.—Oats, 25 cents per bushel; barley, 35 cents per bushel; shorts, $21 per ton; tankage, $55 per ton; skim-milk, 20 cents per cwt.; oilcake meal, $55 per ton.

Deductions.—In comparing lots 2 and 4, we find that the lot receiving skim-milk made greater average daily gains with a considerably lower feed cost.

In comparing lots 1 and 3, we find the difference in gain and feed required per pound of gain to be very small.

The greatest average daily gain and the lowest meal consumption per pound of gain is found in lot 2, which was fed skim-milk in addition to the meal ration, while the lowest average daily gain and the highest meal consumption per pound of gain, is found in lot 4, fed the meal ration only.

The table shows that lot 4, fed the meal ration without the protein supplement, made gains at a slightly lower cost, but on the average they required 93.23 pounds more meal per 100 pounds of gain. This apparent economy of gains made by lot 4 is offset by small daily gains and a subsequent loss in profit.

A study of this experiment leads to the following conclusions:—

1. That all lots of pigs returned a fair profit over feed cost.
2. That the addition of a protein supplement to the meal ration results both in greater daily gains and in more economical gains.
3. That the very slight gain in favour of a combination of tankage and oil meal does not seem to justify the use of both as a supplement when the cost is the same.
4. That where skim-milk is not available throughout the year, tankage or a combination of tankage and oil meal rank very high as a substitute feed and should be fed as a supplement in a ration lacking milk.

FIELD HUSBANDRY

This season was one of the driest on record at this Station. The winter snowfall was very light, and there were no rains until August 20 that were heavy enough to be really beneficial to the crops. The weather was also cool until early June, which retarded growth and proved very detrimental to tender crops such as corn. The grains may have been benefited to some extent by this cool weather, as with heat combined with drought, they might have suffered more than they did.

All the rotations showed a loss regardless of the good prices received for grain. This was due to low yields which in some cases amounted to complete failures.

The wheat yields on all the fields were far below average, and in cases where wheat followed sunflowers or hay, the straw was too short to harvest with a grain binder. One field following sunflowers on the five-year rotation was completely dried out and was ploughed under in July.

The oat and barley crops were poor in most fields, and the threshed grain graded very low. The August rain induced second growth which made the straw desirable as feed.

The yield of roots was poor due to lack of germination. The dry soil at seeding time retarded germination and the winds drifted much of the seed out of the ground before the plants were large enough to hold. The roots on rotation "P" were resown, which made them late and consequently small.

The sunflowers and corn yields were slightly below average in most cases. Sunflowers made the largest growth after the late rains and did not show any great drought resistance during the dry summer. Corn did not suffer to any visible extent from lack of moisture during the season, but was held back by the cool weather in early summer.

The tame hay crop of western rye grass was a total failure, not growing more than eight to ten inches in height. Fifteen acres of white sweet clover sown with a nurse crop of barley in 1923 made an excellent catch and wintered well. It showed promise of a heavy yield, but due to the dry season began to bloom when about eighteen inches in height and only yielded half a ton to the acre. Even with this small yield, compared with western rye grass it shows considerable drought resistance and promises to be a desirable hay crop for dry areas.

PRODUCTION COSTS

The following tables give the cost of producing different crops on each rotation, showing in detail where the expense is incurred:—

COST AND RETURN VALUES

Statement of Return Values—		
Wheat	per bush.	$ 1 30
Barley	"	0 70
Oats	"	0 60
Oat and barley straw	per ton	2 00
Sunflowers	"	3 00
Corn	"	3 00
Turnips	"	1 50
Statement of Cost Values—		
Rent	per acre	$ 3 00
Barnyard manure	per ton	1 00
Seed wheat	per bush.	1 00
Seed oats	"	0 75
Seed barley	"	0 90
Seed turnips	per lb.	0 90
Seed sunflowers	"	0 11
Seed western rye grass	"	0 07
Seed corn	"	0 04
Machinery	per acre	1 00
Horse labour per horse	per hour	0 10
Manual labour	"	0 25
Threshing wheat	per bush.	0 13
Threshing oats	"	0 10
Threshing barley	"	0 11
Twine	per lb.	0 15½
Tractor operator	per hour	0 80
Tractor	"	0 52
Ensilage machinery (rental)	per ton	0 18

COST PER ACRE OF GROWING WHEAT

—	Rotation R. Wheat following sunflowers	Rotation R. Wheat following turnips	Rotation R. Wheat following fallow	Rotation J2. Wheat following hay	Rotation J2. Wheat following sunflowers	Rotation J2. Wheat following corn	Rotation P. Wheat following fallow	Rotation P. Wheat following wheat	Rotation 5yr. Wheat following sunflowers	Rotation J. Wheat following fallow	Rotation J. Wheat following wheat	Rotation C. Wheat following fallow	Rotation C. Wheat following wheat
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Rent	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00
Machinery	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00	1 00
Manure	2 14	2 14	2 14	2 50	2 50	2 50	2 50	2 50	3 00	.....	.....	.....	.....
Ploughing	1 49	1 49	.....	1 43	1 43	1 43	.....	1 43	1 43	.....	1 49	.....	1 17
Cultivating	.....	.....	.....	0 91	.....	.....	.....	.....	.....	0 38	.....	0 36	.....
Packing	0 33	0 33	0 33	0 58	0 71	0 71	0 33	0 65	0 65	0 16	0 30	0 39	0 60
Harrowing	0 39	0 39	0 65	0 52	0 39	0 39	0 52	0 26	0 52	.....	.....	.....	.....
Seed	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25	1 25
Seeding	0 32	0 32	0 32	0 33	0 33	0 33	0 32	0 32	0 32	0 32	0 33	0 24	0 24
Cutting	0 39	0 39	0 39	0 13	.....	0 26	0 52	0 52	.....	0 44	0 40	0 42	0 42
Stooking	0 05	0 05	0 08	0 03	.....	0 03	0 10	0 10	.....	0 06	0 04	0 10	0 05
Twine	0 05	0 05	0 15	0 03	.....	0 03	0 12	0 08	.....	0 12	0 05	0 11	0 05
Threshing	0 42	0 42	1 66	0 42	.....	0 26	1 43	0 60	.....	0 90	0 44	1 49	0 39
Cost of fallow	.....	.....	7 80	.....	.....	.....	8 06	.....	.....	7 43	.....	6 53	.....
Cost per acre	10 83	10 83	18 77	12 13	10 61	11 19	19 15	11 71	11 17	15 06	8 30	14 80	8 21
Yield per acre	bush. 2·80	bush. 3·60	bush. 12·80	bush. 3·20	Failure	bush. 4·00	bush. 11·00	bush. 4·60	Failure	bush. 6·90	bush. 3·40	bush. 11·50	bush. 3·00
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Value per acre at $1.31	3 67	4 72	16 77	4 19	.....	5 24	14 41	6 03	.....	9 04	4 45	15 06	3 93
Cost per bushel	3 87	3 01	1 47	3 79	.....	2 80	1 74	2 55	.....	2 18	2 44	1 28	2 74
Profit or loss per acre	−7 16	−6 11	−2 00	−7 94	−10 61	−5 95	−4 74	−5 68	−11 17	−6 02	−3 85	0 26	−4 28

COST PER ACRE OF GROWING OATS AND BARLEY

—	Oats					Barley		
	Rotation R following wheat	Rotation R following wheat	Rotation J2 following wheat	Rotation 5 yr. following wheat	Rotation J following wheat	Rotation P following sunflowers	Rotation P following turnips	Rotation 5 yr. following oats
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Rent	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00
Machinery	1 00	1 00	100	1 00	1 00	1 00	1 00	1 00
Manure	2 14	2 14	2 50	3 00	.....	2 50	2 50	3 00
Ploughing	1 43	1 43	1 43	1 43	1 49	1 43	.....	1 43
Packing	0 65	0 65	0 32	0 65	0 36	0 26	0 20	0 65
Harrowing	.....	.....	.....	0 26	0 45	0 52	0 52	0 26
Seed	1 50	1 50	1 50	1 50	1 50	1 80	1 80	1 80
Seeding	0 33	0 33	0 33	0 33	0 33	0 32	0 32	0 33
Cutting	0 45	0 45	0 39	0 39	0 45	0 46	0 45	0 39
Stooking	0 07	0 10	0 05	0 10	0 07	0 10	0 10	0 07
Twine	0 05	0 15	0 06	0 12	0 05	0 09	0 09	0 12
Threshing	0 76	2 34	1 50	2 70	0 76	0 48	0 75	0 92
Cost per acre	11 38	13 09	12 08	14 48	9 46	11 96	10 73	12 97
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.
Yield per acre	7·60	23·40	15·00	27·00	7·60	4·40	6·80	8·40
	tons	tons	tons	tons	tons	tons	tons	tons
Yield per acre straw	·26	·59	·32	·84	·26	·28	·32	·26
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Value per acre at 60c. oats	5 08	15 22	9 64	17 88	5 08	.....	.....	.....
70c. barley and $2 straw	.....	.....	.....	.....	.....	3 64	5 40	6 40
Cost per bushel	1 50	0 56	0 81	0 54	1 24	2 71	1 57	1 54
Profit or loss per acre	−6 30	2 13	−2 44	3 40	−4 38	−8 32	−5 33	−6 57

COST OF GROWING TURNIPS PER ACRE

—	Rotation R following fallow	Rotation P following fallow
	$ cts.	$ cts.
Rent	3 00	3 00
Machinery	1 00	1 00
Manure	2 14	2 50
Packing	0 33	0 32
Harrowing	0 39	0 52
Seed	3 73	3 60
Seeding	0 27	0 27
Scuffling	0 27	0 27
Hoeing	2 50	1 20
Pulling and putting in cellar	9 80	8 69
Cost of fallow	9 75	7 80
Cost per acre	33 18	29 17
	tons	tons
Yield per acre	6·13	5·45
	$ cts.	$ cts.
Value per acre at $1.50 per ton	9 19	8 18
Cost per ton	5 41	5 35
Profit or loss per acre	−23 99	−20 99

COST OF GROWING SUNFLOWERS AND CORN PER ACRE

—	Rotation R sunflowers following fallow	Rotation J2 sunflowers following wheat	Rotation P sunflowers following fallow	Rotation 5 yr. sunflowers following hay	Rotation J2 corn following wheat
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Rent	3 00	3 00	3 00	3 00	3 00
Machinery	2 63	2 27	2 55	1 89	2 08
Manure	2 14	2 50	2 50	3 00	2 50
Ploughing	.....	1 43	.....	2 86	1 45
Packing	0 33	0 65	0 32	0 78	0 65
Cultivating	.....	.....	.....	0 58	.....
Harrowing	0 39	0 26	0 52	.....	0 26
Seed	1 54	1 54	1 54	1 56	1 07
Seeding	0 27	0 27	0 27	0 32	0 27
Scuffling	0 27	0 27	0 27	0 54	0 27
Hoeing	2 50	6 20	.....	7 40	3 95
Cutting	0 99	1 21	1 10	0 93	1 21
Twine	0 56	0 37	0 43	0 31	0 50
Ensiling	10 35	8 12	9 89	5 71	6 94
Cost of fallow	9 75	.....	7 80	.....	.....
Cost per acre	34 72	28 09	30 19	28 88	24 12
	tons	tons	tons	tons	tons
Yield per acre	9·05	7·07	8·60	4·96	6·01
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Value per acre at $3 per ton	27 15	21 21	25 80	14 88	18 03
Cost per ton	3 83	3 97	3 51	5 82	4 01
Profit or loss per acre	−7 57	−6 88	−4 39	−14 00	−6 09

EFFECT OF SUNFLOWERS, CORN AND TURNIPS ON FOLLOWING CROP

During the past few years sunflowers have gained considerable prominence as an ensilage crop. This is largely due to their greater hardiness which allows them a longer growing season than corn and makes them a more certain crop. As very little was known of their moisture and plant food requirements and consequently their place in a rotation, an experiment was commenced at this Station in 1922 to determine their effect on the following crop. Corn and roots were used for comparison as their place in a rotation is fairly well established. On rotations "P" and "R" the experiments were on summer-fallow land, and on "J2" after wheat following hay. The resulting yields from "J2" will necessarily be lower.

Two years' results from this experiment are given in the following table and while this is not sufficient to draw any definite conclusions, the consistency of results would lead us to infer that sunflowers are more exhaustive on the soil than either corn or roots. Results are given in tons and bushels per acre.

ROTATION R—SUNFLOWERS AND TURNIPS

Hoed crop	1922	1923	Average	Following crop	1923	1924	Average
	tons	tons	tons		bush.	bush.	bush.
Sunflowers	15·36	11·03	13·19	Wheat	16·4	2·8	9·6
Turnips	16·98	27·70	22·34	Wheat	18·8	3·6	11·2

ROTATION P—SUNFLOWERS AND TURNIPS

Hoed crop	1922	1923	Average	Following crop	1923	1924	Average
	tons	tons	tons		bush.	bush.	bush.
Sunflowers	20·46	9·70	15·08	Barley	41·6	4·4	23·0
Turnips	25·54	26·14	25·84	Barley	48·8	6·8	27·8

ROTATION J2—SUNFLOWERS AND CORN

Hoed crop	1922	1923	Average	Following crop	1923	1924	Average
	tons	tons	tons		bush.	bush.	bush.
Sunflowers	11·58	6·43	9·01	Wheat	11·8	Dried out	5·9
Corn	8·79	8·45	8·62	Wheat	19·6	4·0	11·8

SUMMARY OF ROTATIONS

The following tables are summaries of yields, cost, value, and profit or loss per acre, for six rotations. Where the rotation crop has been grown for a number of years an average of yields is given. The yields are in bushels for grain, and tons for hay and intertilled crops. Barley and oats are credited with two dollars a ton for straw, which is not shown in the yield column. The results shown on these tables are calculated from the cost and return values statement.

ROTATION C (THREE YEARS), YEAR 1924—SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS PER ACRE

Crop	Yields—Bushels		Value	Cost of production	Profit or loss
	Average for two years	1924			
			$ cts.	$ cts.	$ cts.
Fallow	.....	.....	.....	6 53	−6 53
Wheat	18·0	11·5	15 06	8 25	6 81
Wheat	15·8	3·0	3 93	8 21	−4 28

FIVE-YEAR ROTATION (FIVE YEARS), YEAR 1924—SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS PER ACRE

Crop	Yields		Value	Cost of production	Profit or loss
	Average for three years	1924			
	tons	tons	$ cts.	$ cts.	$ cts.
Sunflowers	7·85	4·96	14 88	28 87	−13 99
	bush.	bush.			
Wheat	18·1	Failure	.....	11 17	−11 17
Oats	44·0	27·0	17 88	14 47	3 41
Barley seeded down	26·3	8·4	6 40	12 97	−6 57
	tons				
Hay	0·58	Failure	.....	7 12	−7 12

ROTATION J (SIX YEARS)—SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS PER ACRE

Crop	Yields		Value	Cost of production	Profit or loss
	Average for twelve years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Fallow				7 43	−7 43
Wheat	24·7	6·9	9 04	7 62	1 42
Wheat	16·7	3·4	4 45	8 30	−3 85
Oats seeded down	33·9	7·6	5 08	9 44	−4 36
	tons				
Hay	0·38	Failure		3 52	−3 52
Hay	0·59	Failure		3 53	−3 53

ROTATION J2 (SIX YEARS)—YEAR 1924—SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS PER ACRE

Crop	Yields		Value	Cost Production	Profit or loss
	Average for four years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Wheat	17·5	3·2	4 19	12 12	−7 93
	tons	tons			
Sunflowers	8·08	7·07	21 21	28 07	−6 86
Corn (three-year average)	7 75	6·01	18 03	24 12	−6 09
	bush.	bush.			
Wheat	16·6	2·0	2 62	11 18	−8 56
Oats seeded down	40·6	15·0	9 64	12 08	−2 44
	tons				
Hay	0·75	failure		6 02	−6 02
Hay	0·41	"		6 03	−6 03

ROTATION P (EIGHT YEARS) YEAR 1924—SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS PER ACRE

Crop	Yields		Value	Cost of production	Profit or loss
	Average for twelve years	1924			
	bush.	bush.	$ cts.	$ cts.	$ cts.
Fallow				8 06	−8 06
Wheat	26·8	11·0	14 41	11 09	3 32
Wheat	17·9	4·6	6 03	11 71	−5 68
	tons	tons			
Fallow				7 80	−7 80
Sunflowers (three-year average)	12·92	8·6	25 80	22 39	3 41
Turnips	12 48	5·45	8 18	21 37	−13 19
	bush.	bush.			
Barley seeded down	38·2	5·6	4 52	11 58	−7 06
	tons				
Hay	0·58	failure		6 02	−6 02
Hay	0·76	failure		6 03	−6 03

ROTATION R (NINE YEARS) YEAR 1924—SUMMARY OF YIELDS, VALUE AND PROFIT AND LOSS PER ACRE

Crop	Yields		Value	Cost of production	Profit or loss
	Average for twelve years	1924			
	tons	tons	$ cts.	$ cts.	$ cts.
Fallow				9 75	−9 75
Sunflowers or corn	7·66	9·05	27 15	24 96	2 19
Turnips (three-year average)	16·94	6·13	9 19	23 43	−14 24
	bush.	bush.			
Wheat	27·5	3·2	4 19	10 83	−6 64
Oats	53·1	7·6	5 08	11 38	−6 30
Fallow				7 80	−7 80
Wheat	28·0	12·8	16 77	10 96	5 81
Oats seeded down	50·7	23·4	15 22	13 09	2 13
	tons				
Hay	0·46	failure		5 66	−5 66
Hay	0·81	failure		5 67	−5 67

HORTICULTURE

SEASONAL NOTES

The winter of 1923-24 was mild with a light snowfall, and very little winter killing occurred. The season opened with a backward spring and the flowering period was delayed from ten days to two weeks. Owing to continued drought during this period, conditions were very unfavourable for the set of all fruits.

The flower borders and gardens were well manured in the fall of 1923. The vegetable garden was not ploughed until the spring.

Experimental work with vegetables suffered from the lack of moisture during May, June, July and part of August, and poor germination resulted followed by very slow growth. It is noteworthy, however, that after the heavy rain on August 20th, the tomato, pea, bean, and celery crops gave an average yield. Cabbage, carrots, beets, onions and parsnips gave a low yield, while the yields from other vegetables such as artichokes, Brussels sprouts, melons, peppers, salsify and egg plant were almost a complete failure.

Annual and perennial flowers were checked by the dry season but, after the August rain, came on well and made a gorgeous showing. The lawns were burnt brown, but they too produced a splendid green growth late in the season.

VEGETABLES

ASPARAGUS

The Washington variety grown on this Station produced an average of six pounds per 30-foot row in 1924. The season extended from May 30 to July 5.

BEAN

VARIETIES.—Twenty varieties of bush bean were grown in 1924. The seed was sown on May 15 in rows two and one-half feet apart. The first green beans were picked on August 4, and the season extended to September 7. Stringless Green Pod, Refugee, Masterpiece, Bountiful Green Bush, and Extra Early Valentine are varieties recommended both from a standpoint of yield and quality.

DATE OF SOWING.—An experiment was conducted to compare the different dates of sowing a good standard variety, and five successive sowings were made at intervals of ten days. This experiment has been carried on for a number

of years and from the standpoint of yield, the conclusion is that the most satisfactory time to sow beans is about the first week of June.

EXTENDING THE SEASON.—To determine by which method the season for green beans can be more easily extended, four varieties, including both late and early maturing were sown on May 19, and another standard variety was sown on different dates. The season for the different varieties sown on May 15 extended from August 4 to September 17, and that for Round Pod Kidney Wax sown at ten-day intervals from May 15 to June 25 was from August 9 to September 17.

POLE OR RUNNER BEAN

Four varieties of Pole bean were grown in 1924. The seed was sown on May 15 in rows 6 feet apart. The plants were spaced 4 inches apart in the row and the season extended from August 26 to September 19. The following varieties are recommended both from point of yield and quality: Improved White Runner, Improved Scarlet Runner, pole beans.

BROAD BEAN

Two varieties were sown in the open on May 15. The germination was poor and the cut worms thinned out a number of plants. When harvested on September 22, Seville Long Pod gave a yield of 5 pounds of green beans per 20-foot row.

BEETS

VARIETIES.—Nine varieties and strains were sown in the open on May 9 in rows 20 inches apart. The seed germinated on June 2 and the first bunches were picked on August 1. The following varieties are recommended from a standpoint of yield, quality and smoothness of roots: Detroit Dark Red, Eclipse and Early Blood Turnip.

DISTANCE APART OF THINNING.—One variety was sown on May 9 and the plants thinned to 2, 3 and 4 inches apart in the row. Those thinned to 4 inches yielded 45 pounds; 32 pounds where spacing was 3 inches and 34 pounds where spacing was 2 inches.

DATE OF SOWING.—The result of an experiment conducted to compare different dates of sowing a good standard variety, favours early sowing when yield is desired, but later sowings for quality and smoothness of roots.

CABBAGE

Cabbage usually does well at Rosthern, but the dry season of 1924 checked the growth and reduced the yield. After the rains in August good heads developed and a profitable yield was harvested.

VARIETY TEST.—Seventeen varieties of cabbage were tested. Of these, thirteen were sown in flats in the hotbed on March 25 and pricked out on April 23. These were transplanted to the open on May 27, while those grown in the open were sown on May 8. In each case the rows were 2½ feet apart with the plants set 2 feet apart in the row. The first heads were cut on August 13 from plants raised in the hotbed, and from those sown in the open on August 18. The total average weight of ten heads from the thirteen varieties was 865 pounds from the plants raised in the hotbed, and 826 pounds from those sown in the open.

For each of the past three years New Flat Swedish has given the highest yield and together with Copenhagen Market and Early Jersey Wakefield is recommended for early cabbage. Danish Ballhead is a late variety and an excellent winter keeper.

DATE OF SOWING.—Two varieties were used in conducting this experiment and the results are in accordance with that of other years. The first sowing, which was on May 8, gave the highest yield.

After repeated comparisons covering several years, we find that cabbage grown from plants started in the hotbed is ready for use five to fourteen days earlier and gives a slightly higher yield than that from seed sown in the open, but the difference is not sufficient to warrant the extra trouble of growing in and transplanting from the hotbed.

FIELD TRIALS.—Having had good results from feeding cabbage to live stock, and with a view to determining the commercial returns, an acre of cabbage of the Copenhagen Market variety was sown with the grain drill on May 9 in rows 2½ feet apart and thinned to 24 inches in the row. Two pounds of seed were sufficient to sow the acre. The yield was determined from a measured half-acre and yielded at the rates of 7 tons, 1,690 pounds per acre. From analysis, 9.98 per cent, or 1,565 pounds per acre, was dry matter.

There was a good local demand for cabbage at two cents per pound. Over three tons were stored in a dark, well-ventilated cellar where the temperature can be maintained around 34 degrees. About one-third of this was hung to the ceiling by the roots, the remainder was built upon slatted shelves in narrow piles two rows wide and three tiers deep. This cabbage will be fed to poultry and live stock.

CARROT

VARIETIES.—Six varieties and strains were grown in 1924. The seed was sown in rows 18 inches apart on May 13 and germinated about June 10. The plants were spaced 3 inches apart in the row and the first bunches were picked on July 31. In point of yield and quality, Chantenay and Half Long Scarlet Nantes are recommended for table use.

DISTANCE OF THINNING.—One variety was sown on May 13 and the plants thinned to 1, 2, and 3 inches apart in the row. This experiment has been conducted for a number of years and the results favour thinning the plants from 1½ to 2 inches.

DATES OF SOWING.—An experiment was conducted to compare the different dates of sowing a good standard variety. The first sowing was made on May 13 and the results from four successive sowings favour the early sowing.

CAULIFLOWER

The experiment to determine whether it is better to start cauliflower plants in the hotbed and transplant to the open, or to sow the seed in the open, was continued. Seed of two varieties was sown in the hotbed on March 25 and transplanted to the open on May 27, and seed of the same varieties was sown in the open on May 9.

Plants in the hotbed produced heads seven weeks the earlier, but the yield from the plants started in the hotbed was 35 pounds against 44 pounds from plants developed in the open.

CELERY

Ten varieties and strains of celery were tested in 1924. The seed was sown in pots in the cellar on February 20 and germinated about March 15. The seedlings were pricked out to flats in May and transplanted to the open on June 11. All plants were planted on the level and were earthed up for blanching on August 7 and again on September 12. The crops were harvested on October 3.

VARIETY TEST.—This test was conducted in single rows 4 feet apart with the plants set 9 inches apart in the row. Varieties recommended are: Giant Pascal, Sanford Early Blanching, White Plume, and Winter Queen. These gave an average yield from twelve plants of 20, 17, 16 and 14 pounds, respectively. White Plume is an early variety of excellent quality.

WATERING CELERY.—Two blocks of celery with the same four varieties in each were grown to determine the advantage if any, of watering. One block was soaked weekly throughout the growing season. The yield from forty-eight watered plants was 92 pounds as compared with 61 pounds from the unwatered. The quality of the watered plants was superior.

STORING CELERY.—The late varieties were dug with soil adhering to the roots. Some of the leaves were trimmed off and a string was tied around each plant. The plants were then taken to a dark, ventilated cellar where they were planted in soil about 4 inches deep. After planting, the soil was watered until it was moist taking care to prevent water getting into the heart of the plants. A temperature around 34° F. was maintained. The plants blanched well, and were found to be of excellent quality when used. When the ventilation and temperature are kept under control, celery keeps well in this way till March.

CUCUMBERS

Three varieties of cucumbers were tested under glass in a hotbed and were regularly watered, and yielded as follows: Giant Pera, eighty-eight fruits weighing 49 pounds; Davis Perfect, ninety-five fruits weighing 48½ pounds; Improved Long Green, sixty-nine fruits weighing 34 pounds. The season extended from July 21 to September 26. The yield from plants raised in the hotbed and transplanted to the open, was only 18 pounds from five varieties. A complete failure resulted with those sown in the open.

CITRONS

The seed of two strains of the Colorado variety was sown in pots on April 4 and transplanted to the open in June. When harvested, twenty fruits weighed 40 pounds. The plants were killed by frost on September 21.

TABLE CORN

Nineteen varieties of corn were seeded in the open on May 30, 1924. Only two varieties, Pickaninny and Tom Thumb, were ready for use before the plants were frozen on September 21. Gehu was sown as a field crop on May 23 and was ready for use on September 8. The following varieties are recommended for table use as based on results of previous years: Pickaninny, Early Squaw, Nuetta, Tom Thumb, Gehu, Malakoff and Golden Bantam.

KOHL-RABI

The variety Giant Purple Vienna was grown in 1924. The seed was sown on May 13 in rows 2 feet apart. The plants were spaced to 8 inches and when harvested on October 6, a 30-foot row yielded 63 pounds.

LEEKS

Two varieties were grown in 1924. The seed was sown in pots in the cellar on March 20, pricked out on May 5 and transplanted to the open on June 3. The plants were set two inches apart in rows 18 inches apart. Varieties recommended are Giant Carentan and Dobbies Prize.

PEAS

VARIETY TEST.—Thirty-three varieties and strains of garden pea were grown in 1924. The seed was sown on May 10 in single 45-foot rows, and ger-

minated about June 1. The vines were allowed to climb on a trellis provided by sticking branches into the ground on both sides of the row. Some of the tall growing varieties reached a height of from 3 to 4 feet. Thirty feet of each row were harvested as green peas, and the remainder was harvested when ripe and threshed for seed. Of the varieties to be recommended, the following yielded an average of 18 pounds of green peas in the pod, and were ready for use sixty-six days after the seed was sown: Gradus, Thomas Laxton, English Wonder, Gregory Surprise, Blue Bantam, Bountiful. The late varieties were ready for use from seven to fourteen days later and of those, American Wonder, Harrison Glory, and McLean Little Gem gave an average yield of 22½ pounds of green peas in the pod, and 2¼ pounds of ripe seed from the 30- and 15-foot rows, respectively. The highest yielders of all varieties tried were seedlings developed at the Experimental Station at Invermere, B.C.

Storing celery for winter.

LETTUCE

Fifteen varieties of lettuce were sown in the garden on May 9 in rows 18 inches apart. The plants were thinned to 6 inches apart in the row. The season for use extended from July 18 to August 23. Grand Rapids is the favourite variety for a crop of loose leaf, and as a cabbage type, All Heart and Hanson are recommended.

ONIONS

Variety Test.—Eighteen varieties and strains of onion were grown in 1924. They were seeded in the open on May 5 in drills 1 foot apart. The seed germinated about May 30 and the plants were thinned to 1½ inches apart in the row. The yields of the crop were reduced by injury caused by the onion root-maggot and some of the most desirable varieties gave a poor yield. Yellow Globe Danvers, Giant Prize Taker, Large Red Wethersfield and Ailsa Craig are splendid yielders and are of excellent quality. Yellow Globe Danvers is one of the best winter keepers tested here. Onions keep well when stored in slatted boxes in a cool, dark, well-ventilated cellar, provided they do not freeze.

CULTURAL TESTS.—Sowing seed in the hotbed and transplanting to the open hastened maturity and increased the yield. Contrary to past results, 3-inch spacing this year gave a slightly heavier yield than 2-inch.

PARSNIP

The yield of parsnip was small. Elcombe Giant and Cooper Champion are recommended for yield and for table use. Thinning parsnips to 3, 4 and 6 inches was tried out. Three inches gave the highest yield, of which a large percentage was unmarketable, whereas, when spaced to 6 inches, a larger percentage of the yield was marketable. Sowing on different dates favoured the first and early sowing on May 13.

PUMPKIN

Seed of six varieties of pumpkin was sown in paper pots in the cellar on April 7 and transferred to the hotbed. The plants were transplanted to the open on June 4 and compared with plants from seed sown in the open on May 31. The yields were 243 pounds from those started in the hotbed as against 13 pounds from those started in the open. King of Mammoth outyielded all other varieties. Sugar gave the second highest returns.

POTATO

The potato crop throughout the district was light. In fact potatoes had to be imported, but there was no evidence of such a necessity on the Experimental Station where yields were secured of 364 bushels on 2 acres of manured land that had yielded oat crops in 1923 and 1922. The cultural methods followed at the Station were as follows:—

1. Planting was done before the middle of May.
2. The planting was done 4 inches deep, which allowed for several harrowings before the plants might be injured by the harrow.
3. Disease-free seed of a good variety was used.
4. There was plenty of room between the plants. The rows 4 feet apart and the plants 15 inches apart in the row. So great spacing is not necessary on more favourable ground such as well-manured summer-fallow, but this potato crop acted as a summer-fallow substitute.
5. Cultivation was sufficient to keep down *all* weed growth.

The test of varieties and cultural methods with potatoes was conducted as in other years, on a rich sandy loam soil. The abnormally dry season militated against the growth of the tubers, but the precipitation in August revived the plants, resulting in an average yield of which only a small percentage was unmarketable. Common scab was present on some of the varieties, but apart from this no disease or blight was in evidence.

VARIETY TEST.—Eighteen varieties of potatoes were grown in uniform triplicate plot rows. They were planted on May 13 and the sets were planted 15 inches apart in rows 2½ feet apart. All varieties were given similar and thorough cultivation during the season. They were dug on September 29. The standing of varieties from the standpoint of yield is not indicative of the most desirable varieties when quality is considered. The Irish Cobbler and Early Ohio are possible the most suitable. The former is an early white potato and excells the latter for winter use. Early Ohio is a red potato

POTATO VARIETIES—YIELDS PER ACRE

Name of Variety	Stage of maturity	Large	Small	Total
		bush.	bush.	bush.
Carman No. 1	Immature	309	9	318
Morgan Seedling	Immature	301	12	313
Wee McGregor	Immature	302	9	311
Rawlings Kidney	Immature	282	12	294
Reeves Rose	Mature	265	22	287
Dreer Standard	Mature	274	10	284
Early Ohio	Mature	267	13	280
Late Puritan	Mature	254	23	277
Irish Cobbler	Mature	253	23	276
Dalmeny Beauty	Immature	264	9	273
Rochester Rose	Mature	257	15	272
Everitt	Mature	252	20	272
Empire State	Mature	258	13	271
Bovee	Mature	243	10	253
Moneymaker	Immature	227	20	247
Vick Extra Early	Mature	227	18	245
Gold Nugget	Mature	196	31	227
Up-to-Date	Immature	133	42	175

SETS.—The following kinds of sets were planted in uniform triplicate plot rows on May 12: One, two and three-eye sets; one eye from stem-end, one eye from seed-end and one eye from middle part of tuber; whole small and whole medium sized potatoes. Three-eye cuttings gave the largest yield. Stem-end surpassed the seed-end, whereas the middle portion proved to be inferior to both. The whole potatoes gave a large percentage of unmarketable potatoes. These results are consistent with the average results from other years.

SPROUTING SEED.—An experiment was started this year in which potatoes were divided into four similar lots and placed in different degrees of light and heat for one month before they were planted. Lot one was exposed to light and heat. Lot two was sprouted in a dark cellar and planted with the sprouts on. Lot three was similar to lot two but the sprouts were removed before planting. Lot four was placed in a cool cellar where it did not sprout. Lot two gave a yield of 3 bushels more per acre than lot one, but only 91 per cent of the former was marketable as compared with 98 per cent of the latter. Lots three and four yielded 45 and 64 bushels respectively less than lot two. The sprouted tubers hastened the growth and maturity of the crop.

DATE OF PLANTING.—Commencing on May 7, three uniform plot rows were planted on each of five successive dates at ten-day intervals. The smallest yield was produced from the first planting, whereas, the second planting gave the highest yield. Generally the earliest planting gives heaviest yields.

DATE OF DIGGING.—Irish Cobbler potatoes were dug on seven dates of ten-day intervals. The yields increased from 120 bushels on July 21 to 275 bushels on September 22. The increase was small until the rain of August 20. Next year, plot rows will be planted with seed from the different dates of digging to ascertain whether immature or well-matured tubers make the better seed.

DISTANCE OF PLANTING.—Three plots of four rows each were planted at different distances, 12 by 30 inches, 14 by 33 inches, and 15 by 36 inches (the first figure refers to the spacing between the rows.) The average yields were as follows: 237, 223, and 230 bushels per acre in favour of the closest planting. This compares favourably with the average yields over a number of years with the exception that the widest planting usually gives the lowest yield.

DEPTH OF PLANTING.—Four rows of Irish Cobbler potatoes were planted at each of the following depths: two, four, and six inches. The average yield per acre for the shallow planting was 190 bushels of marketable potatoes, and 36 bushels of small potatoes; 216 bushels of marketable potatoes, and 29 bushels of small potatoes when planted 4 inches deep; and 247 bushels of marketable potatoes, and 15 bushels of small potatoes when planted 6 inches deep. This is consistent with the results obtained in other years of dry, hot seasons, but when the season is cool and wet, the shallow planting gives highest yields. Over an average of a number of years, a depth of 4 inches has given most satisfactory results.

RHUBARB

The dry season of 1924 checked the growth and produced rhubarb which was lacking in flavour. From May 31 to September 8 the area of rhubarb set out in 1922 yielded at the rate of 4 tons 1,800 pounds per acre, whereas the older plantation yielded 4 tons 1,000 pounds per acre.

The two-year seedlings that were transplanted to the rhubarb plantation in the autumn of 1923 developed stalks from 2 to 4 inches in circumference and from 12 to 19 inches in length. One-year seedlings developed stalks 2 inches in circumference and from 9 to 10 inches in length.

FORCING RHUBARB.—Whole roots were lifted in the fall with considerable earth adhering to them and stored outdoors. On December 10 they were planted in a heated cellar, thereby producing rhubarb of excellent quality by January 19.

SEAKALE

Crowns of seakale were placed in soil in a dark corner of the cellar near the furnace on February 5. The first greens were ready to cut on March 11. Seakale provides a splendid source of choice winter "greens."

RADISH

The seed of six varieties was sown on May 13. The seed germinated about May 28 and Icicle and Twenty-Day were ready for use on June 14. Icicle remains in season longer than any other variety tested here. French Breakfast and White Strasburg are recommended for their quality.

SPINACH

Three varieties of spinach were grown in 1924. The seed was sown on May 13. The Victoria variety was ready for use on June 17, and before going to seed on July 5 had yielded 24 pounds of "greens." A volunteer growth came on from the fallen seed after the August rains and gave an additional crop.

SQUASH

To determine whether the yield can be increased by starting squash in the hotbed, twelve varieties were sown and planted in the same manner as were the pumpkins. The yields were 157 pounds from those started in the hotbed as against 36 pounds from those started in the open.

SWISS CHARD

Seed of two varieties was sown in the open on May 5. The plants were thinned to 6 inches apart in the row. Swiss Chard provided an excellent supply of greens after the Spinach had run to seed. By October 6, weight of ten average heads was 23 pounds from Giant Lucullus and 17 pounds from White Silver.

TURNIP

Four varieties of turnip were grown in 1924. The seed was sown on May 13 in rows 20 inches apart. The seed germinated on May 28 and the first bunches were picked on July 11. All varieties possessed bitter and somewhat undesirable flavour. Early Snowball, Extra Early Purple Milan and Golden Ball are recommended for table use.

TOMATOES

Tomato seed was sown in flats in the cellar on March 20. It germinated about the third week of April and was pricked out during the first ten days of May. After being hardened off in the cold frame the plants were set out on June 9 in rows 3 feet apart and the plants 3 feet apart in the row. The dry season was unfavourable for the set of a large quantity of fruit, consequently the yield was below the average.

In the test of varieties, five plants of each variety were pruned to one stem and staked, and an equal number were pruned and left unstaked.

Contrary to past experience, staking did not hasten maturity or increase the yield of ripe fruit this season, but did increase the total yield. The necessity for pruning was of less importance this year because the lack of moisture seemed to retard the growth of side shoots and in both methods the energy of the plant was directed to the ripening of the fruit.

Eighteen varieties were tested in 1924. The following are recommended because they gave a good yield, and are early varieties: Danish Export, Earliana, Bonny Best, Devon Surprise, New 50 Day, Alacrity.

Different Methods of Pruning.—Three standard varieties were used in the test. On June 9 three rows of each variety were transplanted to the open in rows 2 feet apart and plants 2 feet apart in the row. As the fruit set, the plants in one row of each of the three varieties were cut above the first bunch of fruit, and this method of pruning was compared with cutting above the second bunch and above the third bunch. The total yield of ripe and green fruits from one bunch was 57 pounds, 92 pounds from two bunches and 154 pounds from three bunches. The amount of ripe fruit from one bunch was 41 per cent; 37 per cent from two bunches, and 27 per cent from three bunches. Cutting back to one bunch decreased the yield, and did not hasten maturity sufficiently to warrant the practice.

TREE FRUITS

The apple trees wintered well in 1923-24, and carried a heavy bloom in the spring. Owing to the drought, only a small quantity of fruit set, and when mature, was undersize. Fifteen bushels of crabapples were harvested and the fruit was valuable for jelly and preserves. The following apple seedlings were planted out in the orchard this spring: Anoka, Printosh, Lora, Redman, Wapella, Piotosh, Angus, Rosilda.

In the plum orchard only five trees produced fruit. Three seedlings of the Waneta variety were planted in the spring and appear to be well established.

SMALL FRUITS

RASPBERRIES

The eight varieties of raspberries under test wintered well, but lack of moisture greatly reduced the yields. The yields per acre given below are based upon the yields from $\frac{1}{120}$ acre areas and are stated in standard berry boxes (S.B.B.) which contain four-fifths of a quart.

RASPBERRIES—VARIETY TEST

Variety	Yield per acre 1923	Yield per acre 1924	Average yield per acre, 1922-23-24
	S. B. B.	S. B. B.*	S. B. B.*
Miller	5,760	2,123	4,508
Newman No. 23	6,750	1,808	3,833
St. Regis	4,440	1,800	3,530
Herbert	4,350	1,620	3,980
Sunbeam	5,340	1,613	3,678
King	5,220	1,530	2,960
Ohta	5,160	1,260	2,860
Latham (Minnesota No. 4)	5,160	1,230	3,790

*Standard berry box 4/5 quart.

RASPBERRIES

The Miller variety is a heavy yielder, but the Herbert, Newman No. 23, and Ohta varieties are much superior in size and quality of fruit.

In autumn, the practice at this Station is to cut out the old and weak canes. The good ones are bent over and held down with a few clods of earth, and covered with straw or slough hay, which affords ample protection for the winter.

CURRANTS

Several conditions were responsible for the low yields obtained from the currant bushes in 1924. The lack of moisture resulted in a small set of fruit. The imported currant worm (Peteronus Ribesii) was troublesome. To rid the bushes of them required two applications of a poison spray composed of one pound Paris green to forty gallons of water, with enough slacked lime to give the mixture a milky colour. The white maggot did considerable injury to the fruit of all varieties during the growing season. The highest yields of red currants were obtained from Stewart, Red Dutch, Raby Castle and Red Cross. The yield of white currants was a failure. Five varieties of black currants, consisting of twelve bushes each gave a total yield of 138 standard berry boxes. Lee Prolific is one of the finest black currants for size and flavour of fruit, but cannot compare with Climax and Magnus for yield.

STRAWBERRIES

Had it not been that the strawberry plantation was artificially watered there would have been almost no ripe fruit. The highest yield was obtained from Rosthern June Bearing with Dakota in second place.

Strawberry plants require protection against the extremes in temperature throughout the winter and spring seasons. When covered with slough hay, potato tops or pea vines, the snow lodges better and provides an excellent protection.

TREES AND SHRUBS AND FLOWERS

The ornamental grounds continue to be admired by all visitors and are an example of what may be done in the way of home beautification. The lilacs comprise the largest group of ornamental shrubs on the Station and are closely followed by honeysuckle and spiraea. A list of the most promising trees and shrubs can be seen in the 1923 report of this Station.

Several elms were set out on the lawn in the early part of May, 1924.

FLOWERS AND LAWN

Owing to the drought which prevailed throughout the growing season, lawns and flower borders made little or no growth. Nevertheless, after the rain on August 20, the grass grew up green and the annual flowers produced a splendid display. Several of the half-hardy varieties or strains of annuals were started from seed sown in flats in the cellar on March 28. They were pricked out, hardened off in the cold frame, and transplanted to the open about the middle of June.

A list of the annual and perennial flowers recommended may be seen in the 1923 report of this Station.

BULBS

A splendid display of early tulips was made in the spring of 1924. The bulbs were obtained from Holland and planted out the last week of October in 1923. The first bloom was out on May 24, and the duration of bloom extended approximately two weeks. Of the eighteen varieties under test, the following are recommended for their hardiness and attractiveness: White, Pottebakker, La Reine and Lady Boreel; red, Vermilion Brilliant, and Proserpine; yellow, Chrysolora and Couronne d'or (double); red and yellow, Duchesse de Parma, Keizerkroon and Tournesol (double); scarlet, Pottebakker, Artus and Imperator Rubrorum (double).

The late Darwin tulips were winter killed.

Forcing Winter Bulbs.—Bulbs of tulips, hyacinths and daffodils were potted the first week of November, placed in the cellar and covered with two inches of sand. They were watered occasionally and a temperature of 45° to 50° F. was maintained. About January 15 the first potted bulbs were taken to a mild light and a week later were transferred to the living room. With the higher temperature the bloom quickly develops, and usually lasts from eight to twelve days.

Four or five tulip or daffodil bulbs were planted together in five-inch pots, but only one bulb to a pot in the case of hyacinths.

The following are some of the varieties which were grown and are recommended for indoor bloom; Hyacinths—King of the Blues, La Grandesse, Gigantea; Tulips—Cottage Maid, Duchesse de Parma, Keizerkroon, Proserpine; Daffodils—Emperor, Empress, Golden Spur and Sir Watkin.

CEREALS

The cereal crops appeared to meet with all the adverse conditions possible in 1924, at this Station. Regardless of this, the plots on well-prepared summer-fallow gave fair returns and reliable results. The growing season was very dry and the crops at all times depended almost entirely on the moisture stored in the soil. Crops on fall or spring ploughed stubble land were for this reason almost total failures and from an experimental standpoint unreliable. The season throughout was also cool and until early June the temperature was below average. This cool weather proved beneficial to all cereal crops, excepting beans, in that it allowed them to make use of the moisture stored in the soil without excessive loss. The number of days required for maturity was about average but this would have been much longer had there been an average amount of rainfall. A heavy rain storm in late August induced second growth in the oats and barley, but was of very little benefit in increasing yields.

Rust caused no damage as it was only noticed on the very late varieties, and on those in the early rust stages.

WHEAT

Sixteen varieties of wheat were tested under similar conditions on summer-fallow.

The number of days required for a variety of grain to mature is usually a great factor in yielding power. This varies with the seasons, one year favouring early varieties and another the late. This year the season being dry throughout with no damaging rust, all varieties were on an even basis regardless of days required for maturity.

Kitchener, a selection of Dr. Wheeler's, gave the highest yield and grew a good length of straw regardless of the season. It was, however, the latest-maturing wheat of the varieties tested, and if rust had developed sooner it might have suffered. In a three-year average, 1922 to 1924 inclusive, Kitchener is also the highest yielder.

Garnet, a new selection from Ottawa, is showing considerable promise standing up well in yield with some of the older varieties, and has the added advantage of being about ten days earlier than Marquis.

The yields of all the varieties can be ascertained from the tables and, as the older varieties are well known to the public, no comment will be required. Golden, Brownie, Producer and selections by Sanderson and Orchard have not been tested sufficiently long to make any remarks as to their desirability.

The yields from one of the emmers, Early Ottawa 44, is rather misleading as, due to light seeding, there was a very thin stand.

WHEAT TEST OF VARIETIES OR STRAINS

Sown April 28

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre	Yield of grain per acre
			inch	lb.	bush. lb.
Kitchener	Aug. 30	125	23·5	1,140	19 00
Garnet Ottawa 652	" 16	111	23·0	1,100	18 20
Marquis Ottawa 15	" 24	119	22·0	1,060	17 40
Kota	" 26	121	23·0	1,060	17 40
Red Fife Ottawa 17	" 27	122	22·5	1,040	17 20
Supreme	" 23	118	21·5	1,020	17 00
Ruby Ottawa 625	" 16	111	23·5	900	15 00
Golden	" 23	118	20·0	880	14 40
Early Triumph	" 22	117	22·0	860	14 20
Brownie Ottawa 491	" 19	114	23·5	780	13 00
Reward Ottawa 928	" 19	114	23·5	760	12 40
Orchard's Selection	" 27	122	22·0	760	12 40
Producer Ottawa 197	" 18	113	19·0	740	12 20
Sanderson's Selection	" 23	118	21·0	720	12 00
Common Emmer	" 27	122	22·0	720	12 00
Early Ottawa 44, Emmer	" 28	123	27·0	520	8 40

WHEAT—AVERAGE AND ANNUAL YIELDS

Name of Variety	Number of days maturing	Average length of straw	Yield per Acre			
			1924	1923	1922	Average
		inch	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Kitchener	124	38	19 00	36 40	42 40	32 47
Garnet Ottawa 652	111	35	18 20	44 00	35 40	32 40
Marquis Ottawa 15	121	36	17 40	36 57	43 20	32 39
Red Fife Ottawa 17	123	36	17 20	35 12	39 00	30 31
Supreme	119	34	17 00	37 00	35 20	29 47
Early Triumph	116	35	14 20	38 40	33 20	28 47
Kota	120	36	17 40	32 40	33 20	27 53
Ruby Ottawa 625	110	35	15 00	30 40	27 40	24 27
Reward Ottawa 928	111	33	12 40	24 30	29 20	22 10

OATS

Of the ten varieties of oats under test on summer-fallow, none yielded nearly as well as in previous years at this Station.

Gold Rain gave the highest yield but as this is the first time in seven years it has outyielded all other varieties, we cannot recommend it above some others.

Cay's Banner which gave the highest yield in 1923 also did well this year, but it has not been under test long enough to draw any conclusions.

The two old varieties, Banner and Victory, yielded very well when we consider the adverse conditions met with this season, and though others may surpass them occasionally, we know of no better varieties at the present time.

An average of yields taken for eleven years at this Station of these two varieties gives the following results: Victory, 79 bushels 29 pounds, and Banner, 76 bushels 28 pounds. When we include Gold Rain and take a seven-year average, the yields are as follow: Victory, 64 bushels 33 pounds; Banner, 63 bushels 41 pounds; and Gold Rain, 62 bushels 22 pounds.

OATS—TEST OF VARIETIES OR STRAINS
Sown May 2

Name of Variety	Date of ripening	Number of days of maturing	Average length of straw	Yield of grain per acre	Yield of grain per acre	
			inch	lb.	bush.	lb.
Gold Rain	Aug. 18	109	21·0	860	25	10
Banner Cay	" 21	112	21·5	640	18	28
Leader	" 18	109	21·5	620	18	08
Banner Ottawa 49	" 21	112	21·0	600	17	22
Victory	" 20	111	19·5	600	17	22
Alaska	" 3	94	25·0	580	17	02
Longfellow Ottawa 478	" 8	99	24·0	560	16	16
Gerlach	" 20	111	19·0	520	15	10
Laurel Ottawa 477	" 8	99	20·0	460	13	18
Liberty Ottawa 480	" 8	99	26·0	420	12	12

The last two varieties are hulless. For several years it was found impractical to grow them because of the difficulty in treating for smut as the germ in the seed was easily killed. Copper Carbonate dust has proven a very effective treatment and we can now grow them with no loss of germination from this cause. This treatment is also effective for other grains, and has the advantage over formalin in that it can be applied at any time before seeding while formalin should not be applied too early.

BARLEY

The barley varieties suffered more from the very dry season than any other class of cereals. This was largely due no doubt to its shallow rooting habit, which prevented it penetrating deeply for the reserve of moisture in the soil. Of the eight varieties tested on summer-fallow this year, none yielded as well as previously. The barley on old land suffered more but the contrast was not so great between those on summer-fallow and stubble land, as it was with wheat or oats. This goes to show that the barley did not have a deep enough root system to penetrate to the moisture which was stored in the summer-fallow.

The order of yields of barley are rather erratic and not so dependable as the results from wheat and oats, and we find as in the other grains that length to maturity played a very small part in yields this season.

An average of several years shows more reliable results as to the yields of the varieties and with the exception of Bearer which has only been tested one season, a four-year average is given in the following table.

BARLEY—TEST OF VARIETIES

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Yield of Grain per Acre									
				1924		1923		1922		1921		Average	
			inch	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
O. A. C. No. 21	Aug. 18	101	17·5	12	24	52	01	60	20	37	04	40	24
Chinese O 60	" 18	101	18·0	10	00	52	20	45	00	46	12	38	20
Himalayan O. 59	" 3	86	20·0	15	00	39	28	45	40	40	20	35	10
Duckbill O. 57	Sept. 2	116	21·5	16	32	35	40	30	40	35	20	29	33
Junior O. 471	Aug. 11	94	18·0	6	22	35	20	42	24	32	44	29	14
Success	" 8	91	19·0	12	44	44	28	22	24	27	24	26	42
Albert O. 54	" 2	85	20·5	7	04	28	26	27	44	27	44	22	41
Bearer O. 475	" 29	112	21·0	11	32								

WINTER RYE

Winter rye varieties which were hardy enough to withstand the winter gave a fair yield regardless of the season. Four varieties were under test, namely, Dakold, Common, Rosen and Ottawa. The two latter were totally winter-killed, and as they have only survived one winter in three while being tried here we must necessarily infer that they are unreliable. The yields of Dakold and Common for 1924 were 21 bushel and 16 bushel 44 pounds per acre, respectively.

METHODS OF SOWING WINTER RYE

Winter rye was sown with wheat, oats and barley on May 11 and June 12 in 1923. The results are shown on the following table and the yields do not appear very promising. This is the first year of the experiment, however, and we cannot draw any definite conclusions. It will be noticed that the later sowings and those made with barley gave the largest yields.

The yields of nurse crop in 1923 and of rye in 1924 are given in the table.

METHODS OF SEEDING WINTER RYE

Method of Seeding	Date of seeding, 1923	Yield of nurse crop per acre, 1923		Date of ripening of rye, 1924	Average length of rye straw	Yield of rye per acre, 1924	
		bush.	lb.		inch	bush.	lb.
With oats as nurse crop	May 11	37	22	July 31	30·0	3	12
With wheat as nurse crop	" 11	13	40	" 31	30·0	3	12
With barley as nurse crop	" 11	27	24	" 31	32·5	5	40
With oats as nurse crop	June 12	24	04	" 31	31·0	5	40
With wheat as nurse crop	" 12	7	20	" 31	32·5	6	44
With barley as nurse crop	" 12	35	40	" 31	36·0	9	36

DATES OF SEEDING WINTER RYE

Fifteen sowings of winter rye were made at intervals of about a week from the third of July until just before the ground froze. The season of 1923 was fairly moist and all made a good start before winter came, excepting the last sowing, which was too late to germinate. It germinated in the spring of 1924, and was under practically the same conditions as a spring grain. With the exception of two dates of sowing which were added in 1923, the experiment is identical with one carried on in 1922 and 1923. To bring more information together, and get more conclusive results, the yields from the 1922 sowing are included in the following table, and the two years averaged.

DATES FOR SOWING WINTER RYE

1923 Date of Sowing	1924 Date of ripening	Number of days maturing	Average length of straw	Yield of Grain per Acre					
				1924		1923		Average	
			inch	bush.	lb.	bush.	lb.	bush.	lb.
July 3	Aug. 8	402	36·0	8	32	W. killed			
" 10	" 4	391	34·0	6	44	W. killed			
" 17	July 31	380	30·0	3	32	Not sown			
" 24	" 29	371	32·5	6	24	2	28	4	26
" 31	" 29	364	28·5	6	04	2	28	4	16
Aug. 7	" 28	356	29·0	7	48	0	40	4	16
" 14	" 29	350	28·5	7	28	2	28	5	00
" 21	" 31	345	34·0	13	12	11	44	12	28
" 28	" 31	338	37·0	16	44	25	00	20	50
Sept. 4	" 28	328	39·0	16	24	26	24	21	24
" 11	" 31	324	38·0	23	32	24	36	24	06
" 18	" 31	317	36·5	22	28	26	04	24	16
" 26	" 31	309	36·0	22	48	29	16	26	04
Oct. 3	Aug. 8	310	40·0	17	48	Not sown			
Nov. 2	" 8	281	36·0	14	16	32	08	23	12

By the two years results it can plainly be seen that winter rye sown any time from the latter part of August to the last of September, will, under average conditions give best returns.

PEAS

Peas were one class of cereals which germinated and made a good growth during the cool spring and early summer. When soil moisture commenced to be depleted however their growth was checked, and blooming started when the vines were very short. Though the number of pods produced was small compared with that of a good season the pods themselves were of about normal size and well filled. The late rains caused some second growth, but not sufficient to create much difficulty in harvesting and threshing the ripe plants.

Mackay and Cartier gave good comparative yields, but this is the first time they have been tested at this Station.

Champlain and Arthur both stand up well in comparison and as they have been two of our best yielders for several years, we can recommend them as desirable varieties for this district.

Following is the table giving particulars and yields per acre for six varieties tested this year, and also a four-year average of four of them.

PEAS—VARIETY TEST

Name of Variety	Date sown	Days maturing	Length of vine	Yield of Grain per Acre									
				1924		1923		1922		1921		Average	
			inch	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Champlain O. 32	April 29	119	18	11	40	25	40	46	40	36	00	30	00
Arthur O. 18	" 29	121	19	11	00	19	20	45	20	35	20	27	45
Early Feed O. 30	" 29	114	18	9	00	24	20	43	20	30	00	26	40
Chancellor O. 27	" 29	112	20	9	10	26	00	40	00	26	40	25	27
Mackay	" 29	125	18	12	20								
Cartier	" 29	124	19	10	00								

FLAX

The season was very unsatisfactory for flax. The cool spring caused slow growth, and the dry summer premature heading. The straw was short, and the seed balls few and small. Second growth also came on very strong after the late rains in August and the crop was never in good condition for cutting, due to the abundance of green foliage. The threshed sample of grain was good, however, though the yield was small.

Three varieties were tested with the following results. The yields and average for four years are given for Premost and Novelty.

FLAX—TEST OF VARIETIES

Name of Variety	Date sown	Number of days maturing	Average length of plant	1924	1923	1922	1921	Average
			inch	bush. lb.	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Premost	May 10	141	13·5	6 44	14 16	15 40	12 00	12 11
Novelty	" 10	141	13·5	7 28	11 44	17 08	12 00	12 06
Crown	" 10	141	14·0	9 36				

FORAGE PLANTS

This season was one of the most severe on forage crops which we have experienced. Perennials or winter annuals met with a very severe winter, and later a cool spring and dry summer. The winter was open, with slight snowfall and several thaws followed by cold weather. Under these conditions nothing but the very hardy survived. A cool spring retarded growth and lack of rainfall until August 20 made the growth short. Annual crops which were late enough to benefit by the August rain fared moderately well, and the yield from them was nearly average.

ANNUAL HAY CROPS

SWEET CLOVER FOR ANNUAL HAY

Three varieties of sweet clover namely, Hubam, White Blossom and Yellow Blossom, were sown under like conditions for annual hay in 1924. Due to the very dry spring and summer, germination was slow in all of them, and little growth was made before the rain in August. The Hubam grew quickly after the rain, and was a fair height when cut on September 22, though far below an average crop. The two biennial varieties made a short growth, and were not tall enough to cut.

The yield from Hubam in 1923 was much higher than that from the other two, and as an annual clover crop it has promise. We have not been able to mature seed at this Station, however, in the last three years, which is a disadvantage.

VARIETIES OF OAT FOR ANNUAL HAY

Three one-fortieth-acre plots each of eight varieties were sown as a variety test for annual hay. The three plots of each variety were cut at three stages as follows: flowering, turning, and nearly ripe. The whole experiment was duplicated so that there were two plots under the same variety and treatment. All cuttings would make excellent feed, but as those cut when turning combined a well-filled kernel with considerable succulence it would be preferable for hay. The earlier cutting was extremely succulent but lacking in grain, while the straw in the last cutting was not so palatable.

By the following table it will be noticed that any of the first six varieties will give good returns, but that the last two are too low in yield to be grown profitably for this purpose.

OAT VARIETIES FOR ANNUAL HAY

Variety	Cut when nearly ripe, green weight	Cut when turning green weight	Cut when flowering green weight	Average Yield per Acre		
				Green	Field cured 12 p.c. moisture	Oven dry
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lbs.
Gold Rain	6 1,520	6 560	4 100	5 1,393	2 153	1 1,708
Banner	6 760	6 540	3 1,320	5 873	1 1,844	1 1,432
Victory	5 1,020	6 500	4 920	5 813	1 1,907	1 1,488
O. A. C. No. 72	5 1,140	5 1,680	4 600	5 473	1 1,762	1 1,359
Leader	5 980	5 320	4 280	4 1,860	1 1,660	1 1,268
Longfellow	5 580	5 300	3 20	4 967	1 1,357	1 997
Alaska	3 360	3 1,180	3 740	3 760	1 675	1 388
Daubeney	2 1,420	2 1,800	3 80	2 1,767	1 243	1 3

DATES OF SOWING OATS AND BARLEY FOR ANNUAL HAY

Banner oats and Feeder barley were sown at seven dates at week intervals from May 9 to June 20.

Due to the very dry spring and summer, the later sowings which could benefit from the August rains gave the largest yields. The later sowings also made excellent feed this season due to freedom from rust, which usually damages the straw of late-sown grain. The variety of barley used in this experiment is well suited for this purpose, being beardless, and long of straw, which remains green until the kernel is nearly ripe.

The following tables give the yield per acre:—

DATES OF SOWING OATS FOR ANNUAL HAY

Date Sown	Yield per acre green	Yield per acre field-cured*	Yield per acre oven-dry
	tons lb.	tons lb.	tons lb.
May 9	2 440	.. 1,743	.. 1,556
" 16	2 900	.. 1,886	.. 1,684
" 23	2 1,120	1 61	.. 1,840
" 30	3 60	1 132	.. 1,904
June 6	3 720	1 643	1 360
" 13	4 240	1 1,660	1 1,268
" 20	4 1,660	1 1,382	1 1,020

*12 p.c. moisture.

DATES OF SOWING BARLEY FOR ANNUAL HAY

Date Sown	Yield per acre green	Yield per acre field-cured*	Yield per acre oven-dry
	tons lb.	tons lb.	tons lb.
May 12	1 900	.. 1,322	.. 1,180
" 16	1 880	.. 1,281	.. 1,144
" 23	1 800	.. 1,093	.. 976
" 30	1 1,340	.. 1,210	.. 1,080
June 6	2 1,920	1 231	.. 1,992
" 13	4 760	1 1,369	1 1,008
" 20	4 740	2 319	1 1,856

*12 p.c. moisture.

BARLEY VARIETIES FOR ANNUAL HAY

Five varieties of barley were tested for annual hay, and cut at three stages similar to the experiment with oat varieties. The barley, however, suffered more severely from the dry weather, and the yields are accordingly much lower than from the oats.

Following are the yields per acre from the three cuttings and the average:—

BARLEY VARIETIES FOR ANNUAL HAY

Variety	Cut when nearly ripe, green weight	Cut when turning, green weight	Cut when flowering, green weight	Average Yield per Acre		
				Green	Field cured, 12 p.c. moisture	Oven dry
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Feeder	3 1,080	2 1,100	3 620	3 267	1 312	1 64
Early Chevalier	2 1,520	3 1,000	2 1,400	2 1,973	1 373	1 119
Barks	3 180	1 560	3 1,040	2 1,260	1 73	.. 1,851
O. A. C. No. 21	2 1,520	2 80	2 360	2 653	.. 1,788	.. 1,596
689 C 2	2 1,340	1 1,200	2 1,320	2 620	.. 1,779	.. 1,588
Success	1 1,800	1 1,500	1 1,540	1 1,613	.. 1,426	.. 1,273

PEA VARIETIES FOR ANNUAL HAY

Variety	Yield per acre green	Yield per acre field cured*	Yield per acre oven dry
	tons lb.	tons lb.	tons lb.
Champlain	3 1,020	.. 1,958	.. 1,748
Arthur	3 700	.. 1,962	.. 1,752
Chancellor	3 620	.. 1,868	.. 1,668
Early Feed	2 1,740	.. 1,738	.. 1,552

*12 p.c. moisture.

MIXTURES OF PEAS AND OATS FOR ANNUAL HAY

Mixtures	Yield per acre green	Yield per acre field cured*	Yield per acre oven dry
	tons lb.	tons lb.	tons lb.
Peas alone	2 760	.. 1,241	.. 1,108
Peas 10; oats 1	1 1,880	.. 1,398	.. 1,248
Peas 8; oats 2	1 1,940	.. 1,684	.. 1,504
Peas 6; oats 3	1 1,960	.. 1,425	.. 1,272
Peas 4; oats 4	2 900	1 61	.. 1,840
Peas 2; oats 5	2 1,780	1 392	1 136
Oats alone	3 200	1 527	1 256

*12 p.c. moisture.

METHODS OF SEEDING ALFALFA, SWEET CLOVER, BROME GRASS AND WESTERN RYE GRASS FOR HAY AND SEED

The four legumes and grasses were sown by five methods with a nurse crop of oats and without in 1923. The methods of sowing were broadcast, in 6-inch drills, 24-inch drills, 30-inch drills and 36-inch drills. Each sowing was replicated six times, three plots being sown with nurse crop and three alone. Of the three, two were cut for hay, and one left for seed. By this method the hay plots were in duplicate and the seed plots single.

The catch of legumes was damaged considerably by cutworms in 1923, while the plants were still small, which were accountable to some extent for the poor results in 1924. The lack of snowfall and changeable weather during the winter of 1923-24 also caused a great loss in those with poor protection. This was most noticeable in the alfalfa sown alone.

ALFALFA

No results were obtained from alfalfa sown in rows as the growth was too short to harvest, and where sown alone was blown clear of snow all winter. The green weight yield of hay broadcast with nurse crop was 1,880 pounds per acre and without nurse crop 1,780 pounds.

The yield from 6-inch drills was 960 pounds with nurse crop, and 1,620 pounds without. Very little seed was produced on any of the plots, but the wider spacings were superior in this respect.

SWEET CLOVER

Sweet clover sown alone gave much better returns than when sown with a nurse crop. When sown with a nurse crop, yields were only obtained from the broadcast and 6-inch drill sowings, the larger spacings being too uneven and short to cut.

METHODS OF SOWING SWEET CLOVER

Methods of Sowing	Yield when sown with nurse crop		Yield when sown alone	
	tons	lb.*	tons	lb.*
Broadcast	1	800	3	1,140
6-inch drills	1	400	4	20
24-inch drills	.....		3	1,360
30-inch drills	.....		4	1,040
36-inch drills	.....		3	1,620

*Green hay per acre.

METHODS OF SOWING SWEET CLOVER—YIELD OF SEED

Methods of Sowing	Sown with nurse crop	Sown alone
	lb.	lb.
Broadcast	240	160
6-inch drills	200	240
24-inch drills	.....	280
30-inch drills	.....	240
36-inch drills	.....	360

WESTERN RYE GRASS AND BROME GRASS

The grasses made a fair catch on most of the plots in 1923 and would have produced good yields but for the very dry season this year. As will be noticed in the following table, the highest yields were obtained where no nurse crop was used when seeding down. This would be more marked in a dry season and it is doubtful if the increase in the yield of hay would replace the loss of a crop in the previous year.

Seed production was very low on all of the plots, but much better where no nurse crop was used.

METHODS OF SOWING WESTERN RYE GRASS

Method of Sowing	Yield* sown with nurse crop	Yield* sown alone
	lb.	tons lb.
Broadcast	1,460	2 700
6-inch drills	1,840	2 1,000
24-inch drills	440	1 880
30-inch drills	640	1 1,240
36-inch drills	860	1 1,460

*Green hay per acre.

METHODS OF SOWING BROME GRASS

Method of Sowing	Yield per acre* sown with nurse crop	Yield per acre* sown alone
	lb.	tons lb.
Broadcast	1,440	2 ....
6-inch drills	840	2 1,220
24-inch drills	.....	2 180
30-inch drills	.....	1 1,360
36-inch drills	.....	1 1,040

*Green hay.

ENSILAGE CROPS

SUNFLOWERS FOR ENSILAGE

Sixteen strains of sunflowers were tested on wheat land. The yields were below average which was largely due to cutworm damage and also to the dry season. The single-stalk, late varieties gave the largest yields, which could be attributed to benefit derived from late rains. All the varieties were cut when about 75 per cent in bloom, and the earlier strains were all cut before the late rains. Some of the later varieties did not bloom before being cut.

DISTANCE OF PLANTING.—Russian Giant sunflowers were planted in 6-, 24-, 30-and 36-inch drills using one-fortieth-acre plots. The largest yield was obtained from the 30-inch drills and the lowest from the 6-inch. The results from this experiment in 1923 were nearly reversed, the 6-inch sowing giving the greatest yield. With results from a year of above-average rainfall as 1923 and a very dry season as 1924 we cannot draw any conclusions, but if sunflowers were planted in either 24-or 30-inch drills they could cope with the two extremes.

DATE OF PLANTING.—Russian Giant sunflowers were planted on seven different dates at one-week intervals, commencing on May 2. The earlier plantings gave the highest yield, and combining these results with those of 1922 and 1923 on the same experiment, we would infer that sunflowers should be sown within the first two weeks after it is first possible to work the land in the spring.

CORN FOR ENSILAGE

The season was rather cool for corn and while fair yields of fodder were obtained, only the very earliest varieties came near maturity. Lack of rainfall did not cause noticeable wilting amongst the varieties, but the growth would have been much better if precipitation had been heavier. Twenty-six varieties were tested and the tabulated results are given in the following table. All were planted on May 21 and harvested September 9, during which time there were no killing frosts.

VARIETY TESTS WITH CORN

Name of Variety	Source	Average height	Yield green	Yield oven-dry	Stage of maturity
		inches	tons lb.	tons lb.	
Longfellow	J. O. Duke	60	11 1,232	1 534	Tasseled.
Golden Glow	"	60	10 777	1 561	"
Wisconsin No. 7	"	56	10 222	1 429	"
Leaming	John Parks	60	9 1,694	1 244	"
North Western Dent	Steele-Briggs	56½	9 1,430	1 534	Silking.
North Dakota No. 1	J. D. McGregor	55	9 1,034	1 666	Silked.
Bailey	J. O. Duke	57	9 348	1 270	Tasseled.
North Dakota	Steele-Briggs	58½	9 216	1 429	"
White Cap Yellow Dent	"	58	9 54	1 1,168	"
Compton's Early	J. O. Duke	51	8 1,978	1 429	"
Burr Leaming	G. I. Carter	57	8 1,266	1 297	No tassels.
Wisconsin No. 7	John Parks	51½	8 975	.. 1,822	Tasseling.
Leaming	J. O. Duke	56½	8 843	1 191	"
North Dakota White	J. D. McGregor	51	8 711	1 508	Kernels formed.
90 Day White Dent	Dakota Improved Seed Co.	55	8 658	1 191	Tasseled.
Yellow Dent	A. Wimple	51	8 606	.. 1,954	Tasseling.
Longfellow	Dakota Improved Seed Co.	51	8 553	.. 1,768	"
North Western Dent (North Dakota grown)	McKenzie Seeds	50	7 1,998	1 86	Kernels formed.
North Western Red Dent	Dakota Improved Seed Co.	54½	7 1,946	1 138	Silking.
Gehu	J. G. McGregor	46	7 1,391	.. 1,848	Milk.
Hybrid	A. Wimple	48	7 916	.. 1,584	Tasseled.
Pride Yellow Dent	Dakota Improved Seed Co.	52½	7 177	1 86	"
North Western Dent (Nebraska grown)	A. E. McKenzie Seed Co.	51	6 1,996	.. 1,901	Kernels formed.
North Western Red Dent	Experimental Farm, Brandon.	54	6 302	.. 1,690	"
Quebec 28	Macdonald College	52	5 1,352	.. 1,531	Silked.
Amber Flint	A. Wimple	51	5 1,326	.. 1,346	Silking.

ROOTS

SWEDES

Thirty-nine varieties or strains were tested on 66-foot quadruplicate rows. All were sown on May 17, and pulled about October 7, thinned to 12 inches and 30 inches between rows. All were as nearly as possible under the same conditions, and the stand was good considering the season. A heavy rain in August caused a marked late growth in all of the root varieties. The following table gives the results of the six highest yielders:—

SWEDES—VARIETIES

Name of Variety	Source	Yield greenweight	Yield oven dry
		tons lb.	tons lb.
Kangaroo	Steele-Briggs	30 1,010	4 1,874
Jumbo	"	29 159	3 1,841
Invicta Bronze Top	Rennie	28 575	3 1,128
Yellow Tankard	D. L. F. Roskilde	28 179	4 131
Hazard's Improved	Steele-Briggs	27 701	2 1,808
Olsgaard Bangholm	Hjalmar Hartman & Co., Copenhagen.	26 1,882	3 1,339

DISTANCE OF THINNING.—Halls Westbury swede turnips were thinned to 6, 12, and 18 inches to determine at which distance the most profitable yields were obtained. An average of four years is given in the following table, and from it we would infer that 12-inch spacing is the most desirable. The distance between the rows was 30 inches in all cases.

DISTANCE OF THINNING—SWEDES

Distance of Thinning	1924		1923		1922		1921		Average	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
6 inches	17	1,244	22	154	22	1,802	18	353	20	388
12 inches	19	861	21	1,824	25	1,461	20	576	21	1,680
18 inches	19	333	20	1,646	24	1,325	20	1,728	21	758

CARROTS

The germination in carrots was poor, due, apparently, to the dry condition of the soil. Cutworms also caused damage, so that the yields were unsatisfactory. The average yield of carrots in a good season at this Station is about ten tons per acre, while this year it was about two. A Half Long White type from Sweden gave the highest yield.

SUGAR BEETS

Eight varieties were tested this season. With the exception of Sluice Brothers' seed, all germinated well and produced average yields. Some damage from cutworms was noticed, but the beets did not suffer to the same extent as mangels.

Following are the yields per acre in green and dry state:—

VARIETY TEST—SUGAR BEETS

Name of Variety	Source	Green		Dry	
		tons.	lb	tons	lb.
Horning	Dominion Sugar Co.	15	1,231	3	970
Schreiber & Son	" "	15	1,126	3	415
Kitchener	" "	14	1,014	2	1,966
Henning & Harving	" "	13	1,509	3	204
Dippe	" "	12	182	2	1,042
Dr. Burgman	" "	11	519	1	1,142
Vilmorin's Improved (B)	Vilmorin's Andrieux, Paris, France.	10	1,305	2	39
Sluice Bros.	Dominion Sugar Co.	Very little germination.			

FALL TURNIPS

Ten varieties were under test, all of which returned low yields. In comparing them with swedes, we must consider that fall turnips make their maximum growth during the summer, while swedes make a strong growth early in the fall. This season the swedes benefited by the late rains while the fall turnips had completed their growth at this time. While the yields were low, however, the quality was much superior to that usually harvested, as all the roots were sound.

The yields in green and dry state are given in the following table for the six highest-yielding varieties:—

FALL TURNIPS—VARIETY TEST

Name of Variety	Source	Yield green weight		Yield dry weight	
		tons	lb.	tons	lb.
Improved Greystone	Steele-Briggs	12	1,555	1	930
Greystone	Steele-Briggs	12	526	1	323
Early Six Weeks	Sutton	11	730	1	191
Purple Top Mammoth	Sutton	11	44	1	297
Red Paragon	Sutton	10	1,463	1	244
White Globe	Ewing	10	150	1	218

MANGELS

Forty-two varieties and strains were tested this season. Considerable damage was caused by cutworms which cut off the young plants shortly after they emerged. This, however, did not materially affect the yields, as they were calculated on portions of the plots not damaged. The yields compare favourably with those obtained last year, and the dry matter content of the roots was much greater.

The yields per acre for the six leading varieties are given in the following table:—

TEST OF VARIETIES—MANGELS

Name of Variety	Source	Yield green weight		Yield oven-dry weight	
		tons	lb.	tons	lb.
Rosted Barres	Hjalmar Hartman & Co., Copenhagen.	38	32	4	791
Elevatham Mammoth	" "	37	1,742	5	138
Eckendorfer Red	" "	35	1,042	3	1,920
Taarojc Barres	" "	34	640	3	1,920
Yellow Intermediate	Central Experimental Farm	33	1,874	6	197
Eckendorfer Yellow	Hjalmar Hartman & Co., Copenhagen.	33	845	3	1,498

POULTRY

More attention is being given each year to poultry work by our western farmers, showing the higher value at which poultry keeping on the farms is being placed. Many interested in the work visit the plant throughout the season, seeking information as to correct feeding methods, handling of laying stock, hatching and rearing of chicks, etc.

While a number of cockerels are sold off as breeders, each season, the demand is not as keen as it might be, and good birds have to be disposed of as dressed fowl, which if distributed among the farmers, would undoubtedly improve the standard and productive qualities of their flocks.

It has been proven that the quickest way to increase the average egg yield of any flock is by using male birds of good breeding. In practising this method on the Station here each year, a decided increase is noticed in individual and flock production. Taking the average of fifteen of the best layers for the last three years, 1922-1923 and 1924, the production was increased from 132 eggs per bird in 1922 to 151 eggs per bird in 1923, and to 162 eggs in 1924.

The weather throughout the mating season of 1924 was very favourable to good fertility, no real cold snaps occurring after the breeding pens were made up to interfere with close mating, with the result that a big percentage of the eggs laid contained good strong germs capable of producing chicks full of health and vitality.

MONTHLY HATCHING RESULTS

In the hatching of settings, each month the results compared favourably with those of past years, in that fertility ran at 83 per cent through April and May, as against 68 per cent for the months of February and March. However, the mortality of the chicks was considerably higher among those of the later months.

MONTHLY HATCHING RESULTS

Time set	Total eggs set	Per cent fertile	Per cent fertile eggs hatched	Per cent chicks alive at three weeks old	Total eggs required for one chick hatched	Total fertile eggs for one chick hatched	Total eggs required for one chick three weeks old
February	156	65·4	40·1	92·6	3·8	2·4	4·1
March	996	69·3	34·1	87·7	4·2	2·9	4·8
April	2,805	83·2	36·6	83·6	3·2	2·7	3·9
May	1,476	83·9	42·8	80·6	2·7	2·3	3·4

It is more expensive to raise February-and March-hatched chicks than those hatched in April or May, yet for the added cost of the few more eggs required for each chick, the earlier birds are much more desirable, in that they reach maturity earlier, and the pullets give a heavier production when eggs are at a high value.

HENS VS. PULLETS FOR BREEDING

The use of immature birds and those that have been heavily fed for eggs through the winter, and the small size of their eggs, all combine to bring about unsatisfactory hatching results. While carefully selected pullets may give good results in the breeding pen, taking one year with another, pullets are not as good as mature hens. However, as will be noticed from the following table, there was no difference in fertility, hatchability or viability as between hen's eggs and pullet's eggs this season.

HATCHING RESULTS FROM HENS AND PULLETS

—	Total eggs set	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched	Per cent chicks hatched alive at three weeks old	Total fertile eggs for one chick hatched	Total eggs required for one chick three weeks old
Hens	2,315	79·0	31·4	39·8	79·6	2·5	3·9
Pullets	3,626	78·9	30·5	37·3	86·3	2·6	3·7

MILK VS. BEEF-SCRAP FOR EGG PRODUCTION

In comparing the value of milk vs. beef-scrap for egg production, thirty hens of similar quality were divided into two pens, each housed under the same conditions, and receiving the same feed rations with the exception that the hens in pen No. 2 had 15 per cent of beef-scrap added to their mash and pen No. 1 had no beef-scrap but got all the skim-milk they would consume. The period of the experiment was four winter months. Results show that pen No. 1 produced 228 eggs at a cost for feed alone of 36 cents per dozen, while pen No. 2 laid 264 eggs at a cost of 39 cents per dozen.

PREPARING CHICKENS FOR MARKET

An experiment was conducted on three methods of fattening chickens for market with the following results as per table:—

CRATE, PEN AND RANGE FOR FATTENING COCKERELS

—	Lot 1 — Confined to pen	Lot 2 — Crate fed	Lot 3 — On range
Number of birds	36	36	36
	lb. oz.	lb. oz.	lb. oz.
Initial weight	90 12	87 12	85 4
Finished weight	120 0	145 12	116 12
Total gain in 20 days	29 4	58 0	31 6
Average gain per bird	0 13	1 9	0 10·5
Total mash consumed	141 0	142 0	145 8
	$ cts.	$ cts.	$ cts.
Total cost of feed consumed	1 76	1 77	1 80
Cost per pound of gain	0 06	0 03	0 05½

The cockerels were fed a mash composed of equal parts of ground oats, ground barley and shorts, moistened with buttermilk, and in addition had water to drink. The results prove in favour of crate fattening, which gave practically twice the gains secured by the other methods.

MASHES FOR CRATE-FATTENING

To arrive at the feed value of different mashes procurable on the farm as fattening rations, six lots of cockerels were placed in crates and fed the following mash mixtures: Equal parts each of—(1) Cornmeal and shorts. (2) Oatmeal and barley meal. (3) Oatmeal and shorts. (4) Barley meal and shorts. (5) Oatmeal and feed flour. (6) Barley meal and feed flour. All mashes were mixed with enough buttermilk to make a batter.

MASHES FOR CRATE-FEEDING

—	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6
Number of birds	36	27	27	27	27	27
	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
Initial weight	86 4	79 8	76 0	75 8	75 12	78 8
Finished weight	121 12	115 12	102 12	97 12	100 8	103 0
Total gain in 20 days	35 8	36 4	26 12	32 4	24 12	24 8
Average gain per bird	0 15·7	1 5·5	0 15·8	1 2	0 14·6	0 14·5
Total mash fed	132 0	115 12	132 0	130 0	138 0	141 0
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Cost of feed	2 64	1 15	1 69	1 62	2 07	2 11
Cost per pound of gain	0 7·4	0 3·2	0 6·5	0 5	0 8·6	0 8·8

The feed was charged at the following rate:—

Ground barley	1 cent per pound.
Ground oats	1 cent per pound.
Shorts	1½ cent per pound.
Feed flour	2 cents per pound.
Cornmeal	2½ cents per pound.
Buttermilk	1 cent per gallon.

This experiment was repeated three times, and is fairly conclusive. Corn meal is too expensive in a fattening ration. Feed flour makes a sticky batter and the birds do not take to it readily. Shorts and ground oats and barley are readily procurable on most farms, are not expensive, and give satisfactory gains.

CRATE-FEEDING PULLETS BEFORE LAYING SEASON

An attempt was made to determine whether flushing or forcing pullets by crate-feeding for three or four weeks in the fall would affect their egg production throughout the following winter months. Twenty pullets were divided into two lots of ten, each of equal age and weight. One lot was placed in crates and fed for four weeks, a mash of equal parts ground barley, oats and shorts mixed moist with milk, the other lot received the same ration, but was allowed its liberty on free range. At the end of the four-week period, all were placed together in winter quarters, and received exactly the same feed and attention. The results showed that there was nothing gained by the extra labour of flushing pullets, as those left on free range gave a production for the six-months' period of 751 eggs against a total of 653 eggs from the lot that had been crate-fed.

GREEN DUCKS

An experiment was carried on to find out the cost of raising ducks to the age of nine weeks. The ducks were hatched in an incubator on May 26, 1924, and brooded under a coal-burning brooder until old enough to do without heat, when they were placed in a coop with a grass-run. The mash used was composed of one part each of bran, corn meal and shorts and ¼ part of beef-scrap with some sand added. This was mixed with skim-milk at the rate of 1 pound mash to 1½ pounds of milk. They also got milk as part of their drink.

FEEDING GREEN DUCKS—COSTS AND RETURNS

	lb. oz.
Weight of twenty-one ducks when hatched	1 09
Gain in weight at nine weeks	96 07
Total weight at nine weeks	98 00
Loss of weight in dressing	16 00
Total weight dressed	82 00
	$ cts.
Cost of ducks when hatched	4 20
Cost of feed consumed	4 30
Receipts from 82 pounds at 30 cents	24 60
Total profit	20 30
Average profit per bird	0 76

Mash was charged at 1¼ cents per pound and milk 1 cent per gallon.

BEES

Work with bees began in 1923 and four colonies were stored for the winter, two in a cellar, and two outside. One colony stored inside and one outside died during the winter. The others were very weak. The two weak ones were united in the spring of 1924, and one strong colony developed.

Then two-pound packages of bees with queens arrived from Texas on June 3 in good condition. They were released on five drawn combs, each in ten-frame Longstroth hives with sufficient food to carry them along until they became strong enough to gather stores. Frames of foundation were given as necessary and an average of fifteen combs per package was built up during the season. The average yield of extracted honey per package of imported bees was 40.1 pounds, and that from the wintered-over colony, 13.8 pounds.

The eleven colonies were prepared for out-of-doors wintering, two four-colony, one two-colony, and one single-colony cases being used. Some of the dark honey was taken from the brood chambers and an average of twenty-two pounds of sugar made into syrup was fed to each of the colonies in the four-colony cases, thirteen-and-a-half pounds to each in the two-colony case, and twenty-four and three-quarter pounds to the single colony. Feeding was done between September 30 and October 11, and a few weeks of fine weather after this were favourable for ripening and sealing the stores.