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 1925

Some of the Holstein cattle at Rosthern. Five cows finishing their lactation periods in the year averaged 16,182 pounds of milk and 758 pounds of butter in 365 days.

Printed by Authority of the Hon. W. R. Motherwell, Minister of Agriculture,
Ottawa, 1926

TABLE OF CONTENTS

DOMINION EXPERIMENTAL STATION, ROSTHERN, SASK.

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

SEASONAL NOTES

The winter of 1924-25 was peculiar in that shrubbery and fruit bushes and trees came through with practically no injury; whereas all winter rye and some tender grasses killed.

Work on the land began April 16 but was interrupted on the 18th by rain and snow, and seeding was not general till April 30, after which it was completed under favourable conditions.

Plenty of rains, except in late July and early August, resulted in a splendid yield of all crops.

Pastures and lawns were the best they have been in the records of the Station.

Autumn rains delayed threshing and lowered grades in market wheat. Delay in threshing caused little fall ploughing to be done.

METEOROLOGICAL RECORDS AT ROSTHERN, 1925

Month	Temperature °F.					Precipitation		Total sunshine	Evaporation
	Highest	Date	Lowest	Date	Mean	1925	15-year Average 1911-1925		
						inches	inches	hours	inches
January	30·2	23	−34·0	14	−3·78	0·70	0·80	70·7	.....
February	34·8	5	−18·7	1	0·58	0·50	0·46	121·1	.....
March	43·2	24	−27·5	1	16·18	0·50	0·61	125·8	.....
April	69·2	10	24·2	29	41·96	1·71	0·87	239·2	.....
May	91·0	21	24·0	10	53·69	0·96	1·57	303·8	3·28
June	81·2	21	37·2	7	58·75	4·01	2·18	259·9	3·63
July	90·2	13	37·0	8	64·03	2·31	2·62	326·2	5·68
August	92·1	3	35·6	25	61·55	3·60	2·04	257·7	4·11
September	84·0	1	30·5	27	51·99	2·44	1·66	186·0	2·29
October	57·6	14	1·1	29	30·70	0·87	1·59	124·0	.....
November	45·1	1	−18·2	27	21·50	0·25	0·57	105·2	.....
December	42·2	7	−25·4	27	13·00	.....	0·51	72·3	.....
Totals	.....	.....	.....	.....	.....	17·85	15·48	2,191·9	18·99

HORSES

At the present time there are nineteen horses on the Station made up of eighteen work-horses and one driver. All the animals are kept wholly for work with various departments of the Station. No breeding work was carried on.

All of the horses have been kept in a healthy, thrifty condition throughout the year on a ration consisting of western rye grass hay, cut oat straw, whole oats and bran. Raw potatoes and carrots were added to the ration and fed twice a week during the winter months. The daily ration for horses at heavy

work consists of fifteen pounds of oats, three pounds of bran and all the hay they will clean up. The horses at moderate work receive the same feed with the grain ration reduced one-half.

In winter the idle horses are turned out into a field for the day.

BEEF CATTLE

On account of the shortage of feed no steer-feeding experiments were undertaken during the winter of 1924-25.

For the winter of 1925-26 an experiment has been started to compare yearlings with two-year-olds, to compare the feeding value of a combination of ensilage and roots (turnips) with ensilage alone for fattening steers, to ascertain the cost of finishing beef under present-day conditions, and to determine whether winter steer-feeding is profitable.

DAIRY CATTLE

The dairy cattle kept on the Farm are pure-bred Holstein-Friesians. On December 31, there were twenty-five head of cattle as follows: one mature bull, one yearling bull, one bull calf, ten mature cows, two three-year-olds, four two-year-olds, two yearlings and four heifer calves. A rather unusual feature and one which is retarding somewhat the development of the herd is the fact that of the thirty-one calves dropped during the last three years, twenty-one of them have been males.

The present herd sire Inferno Woodcrest—35725— is a mature bull of very fair type and quality with good breeding back of him and it is expected that he will make an improvement as have the other bulls used, in both milk and butter fat. His calves are very promising and are giving every indication of developing into individuals of real merit.

The previous herd sire Agassiz Sir Pietje—51064— was transferred to the Central Experimental Farm, Ottawa, in March. He is the sire of nine promising heifers in the herd, four of which are entered in the Record of Performance for the first time and promise to make a creditable showing.

To replace the bull Agassiz Sir Pietje—51064— an extra good young bull was received from the Experimental Farm at Agassiz, B.C. This bull, Agassiz King Pietje Canary—63093— born September 11, 1924, gives every indication of developing into an outstanding individual of the breed as to type, breediness and quality. He is a grandson on his sire's side of Lady Pietje Canary Jewel —17314— who has a record of 24,358 pounds of milk and 1,197 pounds of butter as a three-year-old. This was the largest butter record of any cow of any breed in Canada at that time. His sire, Sir Canary Pietje—22654— has to his credit fourteen tested daughters and two sons, and his sire's sire, Sir Canary Mechthilde—5318— thirty-five tested daughters and ten sons. His dam, Agassiz Pietje Canary Queen, is untested, but traces back on the dam's side of her pedigree to that great cow, Pietje Priscilla Mechthilde—14123— the dam of the former herd sire, Agassiz Sir Pietje. She in turn has four daughters which have already qualified, one of which has a four-year-old record of 19,935 pounds milk and 933 pounds butter, and another a three-year-old record of 18,731 pounds milk and 825 pounds butter—the best three-year-old in Canada that year.

All cows and heifers in the herd are entered in the Record of Performance as soon as they freshen so that all bulls sold from the herd have the backing of semi-official records of production. The result has been a ready sale of bull calves to farmers at moderate prices. During the year nine young bulls were sold to farmers throughout the province. Numerous calls are received for

females but none have been sold as they are being kept until at least the yield of their first lactation period has been ascertained.

In November, 1925, the herd was again found entirely free from tuberculosis having successfully filled all requirements under the accredited herd scheme, thus maintaining the standards set up in 1921.

The average production of the seven cows finishing a lactation period within the calendar year 1925 was 14,974 pounds of milk and 565 pounds of fat for an average milking period of 402 days. At the present time twelve cows and heifers are on test. Some very creditable records have been made to date. The most important record is that of the mature cow, R.E.S. Madrigal Gypsy Kyes—68180— with 20,000 pounds of milk and 1,057 pounds of butter produced in 365 days.

TABLE SHOWING RECORD MADE BY R. E. S. MADRIGAL GYPSEY KEYES—68180—IN THREE R.O.P. TESTS

Age at commencement of Test	Average per cent of fat	Number of days in test	Pounds of milk	Pounds of fat	Pounds of 80 per cent butter
Years days					
3 322	3·40	365	18,522	630	787·5
5	3·84	365	18,865	726	907·5
7	4·23	365	20,000	846	1,057·5
Totals			57,387	2,202	2,752·5

THE FOLLOWING IS A LIST OF COWS QUALIFYING IN R.O.P. TESTS IN 1925 TOGETHER WITH AMOUNT OF PRODUCTION

Name and Number of cow	Class	Number of days milking	Pounds of milk Produced	Average Per cent fat	Pounds of fat produced	Pounds 80 per cent butter
R. E. S. Madrigal Gypsy Keyes	Mature	365	20,000	4·23	846	1,057·5
R. E. S. Johanna Sylvia	Mature	365	17,356	4·02	698	872·5
R.E.S. Johanna Keyes Lass	Mature	365	16,543	3·75	620	775·0
Rosthern Mechthilde Lass	2-yr-old	365	14,300	3·18	455	568·75
R.E.S. Sarcastic Sylvia	Mature	365	12,713	3·27	416	520·0

This gives an average production for five animals of 16,182 pounds of milk and 607 pounds fat equal to 758·75 pounds of 80 per cent butter in 365 days.

SUMMER FEEDING

Brome grass pasture is the only means by which succulence is provided for the milking herd during the summer months. To supplement the pasture a meal ration is fed three times daily in direct proportion to the amount of milk given by each individual animal. The senior herd sire and the yearlings and heifers not in milk are on pasture without meal during the summer. To provide succulence for the young calves in the barn, grass is cut and fed in the green state. After three months of age the calves are given the run of a paddock or small field with grass and fed about ten pounds of skim-milk twice daily. In addition they get grain. In the fall to supplement the dry pasture, fodder corn and cabbage are used as soiling crops. The herd is stable-fed until June 1 as grass is usually not abundant until that date. The herd was stabled in the fall on October 25.

WINTER FEEDING

The roughage ration for the winter season consists chiefly of corn and sunflower ensilage, turnips, western rye grass and brome hay. The succulent roughages are fed in the proportion of 20 pounds of roots to 40 pounds of ensilage

making a total of 60 pounds per head per day. The meal mixture fed the cows consists of 400 pounds oat-chop, 200 pounds bran, 200 pounds oil meal and 150 pounds barley-chop. This meal is fed on the basis of 1 pound of meal to each three and a half pounds of milk produced.

All cows on test are milked three times daily. The work in the stable is done with as much regularity as possible. The meal is fed on top of the silage before milking in the morning. Two hours after this, hay is fed. Immediately after milking at noon they are fed meal on some roots. At half past three in the afternoon they receive more meal on silage followed by hay and at night a small allowance of roots. Fresh water is available twice daily.

The herd bulls and the yearling and two-year-old heifers not in milk are fed a ration of corn silage, roots, oat and legume hay. They are given the run of a shed open to the south and a small yard and are fed and watered outside. They are thus sheltered from all winds but those from the south. The sheds are cleaned out twice weekly and supplied with fresh bedding. They are fed and watered twice daily.

The young calves are given a clean, airy, light, roomy stall in winter. They are fed whole milk three times daily, beginning with three pounds at each feed which is gradually increased to a maximum of eighteen pounds per day at three months. The milk allowance is then gradually changed to skim-milk and increased to about twenty pounds per day. Roughage and meal is fed as soon as the calves are old enough to eat it. They are given as much variety as possible which includes pulped roots, ensilage and hay as well as meal. The meal in all cases is made up of equal parts by weight, of bran and oat-chop, preferably with one-third part oil cake meal. Calves are kept on skim-milk until from six to eight months after which they are given no more milk.

In the accompanying table is a statement of the production of each of the seven cows ending their lactation period within the calendar year 1925 together with the amount of feed consumed, cost of milk-production and profit from each cow. In addition to those reported there are several cows that have not completed a period during the year and heifers which are now milking in their first period.

The profit column shows a comparison only between cost of feed and value of milk produced. The cost of labour and the interest on the investment are not included nor is the value of calf at birth.

In estimating the cost of feeds the following values were used:—

Meal (oats, bran, oil cake and barley)	$40 00 per ton
Corn and sunflower ensilage	4 00 per ton
Turnips	2 00 per ton
Hay	9 00 per ton
Pasture per month per cow	2 00

The meal mixture is charged at cost price and roughage at cost of production.

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	Amount of meal eaten	Roots and ensilage eaten	Amount of hay eaten	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 of feed 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—68180	5	450	21,559·1	47·9	4·23	912	1,140·0	6,260	13,620	3,405	2,270	4·25	173·99	431·18	257·19	0·81
R. E. S. Johanna Sylvia—68179	4	468	19,442·3	41·5	4·02	782	977·5	5,678	13,650	3,410	2,270	6·8	167·53	388·85	221·32	0·86
R. E. S. Johanna Keyes Lass—68182	2	375	16,795·2	44·8	3·75	630	787·5	4,842	13,620	3,405	2,270	4·8	146·59	335·90	189·31	0·87
Rosthern Mechthilde Lass—104426	1	375	14,375·2	38·3	3·18	455	568·7	4,203	13,860	3,305	2,170	4·5	133·20	287·50	154·30	0·93
R. E. S. Pontiac Madrigal—81022	2	412	14,843·1	36·0	3·81	565	706·2	4,788	14,232	3,427	2,170	4·5	145·39	296·86	151·47	0·98
Rosthern Abbekerk Sylvia—101455	1	381	9,131·1	24·0	4·01	366	457·5	2,666	13,620	3,405	2,270	5·0	103·07	182·62	79·55	1·13
R. E. S. Abbekerk Madrigal Keyes—90506	2	354	8,670·5	24·5	3·50	248	310·0	2,700	13,020	3,255	2,170	4·5	101·51	173·41	71·90	1·17

SHEEP

The breeding flock of sheep at this Station on December 31, 1925, numbered fifty-eight head, including three pure-bred Suffolk ewes, one pure-bred Suffolk ram, thirty-three grade Leicester ewes, one pure-bred Leicester ram and twenty grade Leicester ewe lambs. Ten of the lambs were bred to lamb in the spring of 1926 and ten kept as a check to be mated at the age of nineteen to twenty months so as to lamb when two years old. The object of this experiment is to determine if it might be advisable to breed ewe lambs at the age of seven to eight months so that they might lamb when they are one year old.

The start in Suffolk sheep was made in the fall of 1925 when three pure-bred shearling ewes in lamb to a pure-bred Suffolk ram and one registered Suffolk ram were purchased with the following objects in view, viz: to establish a breeding flock of high-quality pure-breds, to study feeding and breeding problems, to supply breeding stock and to test out the breed as to its suitability for this climate.

The grade Leicesters developed in the grading-up experiment, in which range-bred ewes and their offspring have been, since 1915, bred to good pure-bred Leicester rams are at present a uniform high-grade flock closely resembling the pure-bred Leicester in conformation, quality and clip of wool. Some improvement in the clip of wool is noted year by year. The wool clip the first season averaged eight pounds per sheep. In 1925 it averaged nine and seven-tenths pounds.

When the grading-up experiment was finished it was decided to determine the advisability of crossing the pure-bred Suffolk ram on grade Leicester ewes. The grade flock was divided in the fall of 1925 into two lots as nearly equal in regard to number, age and general quality as possible. One lot was bred to the Suffalk ram and the other to the Leicester with the object of making a comparison of breeds of rams to use in siring grade lambs.

Out of a total of thirty-six ewes bred including eleven lambs born in 1924, forty-five lambs were raised or 1.25 per head.

The sheep were carried through the winter of 1924-25 on a ration consisting of western rye grass hay, whole oats, bran and oil cake meal. The grain mixture, two parts whole oats, two parts bran and one part oil cake, was fed at the rate of three-quarters of a pound per ewe per day. After lambing the grain ration was increased to one pound per day and turnips was added to the ration. They were watered daily and had constant access to rock salt.

In the summer the sheep were kept on a pasture of western rye grass and they had free and easy access to water. In October the flock was severely culled, only the promising ewes and lambs being retained for breeding purposes. All ewes that were aged, thin in flesh, off type and poor breeders were disposed of. The breeding flock was flushed on the stubble and root-fields preparatory to breeding. The rams were put with the ewes on October 16.

The pregnant ewes were divided equally into two lots in December, 1925, and an experiment started to determine what effect the feeding of silage and turnips to pregnant ewes will have upon the health and vigour of the lambs at birth. Lot 1 is fed western rye grass hay, oat sheaves and corn silage. Lot 2 is fed similar feeds to lot 1 except that they receive turnips instead of silage. No grain will be fed until two weeks before the lambing season begins. Notes will be taken on the condition of the lambs at birth.

SWINE

The Berkshire, Tamworth and Yorkshire breeds of swine are kept at the Rosthern Station. The Berkshire herd consists of six brood sows and one boar, the Tamworths of seven brood sows and one boar and the Yorkshires of

five brood sows and one boar. The Yorkshire herd was strengthened this year by the addition of a young boar of exceptionally fine bacon type and quality obtained at the Central Experimental Farm at Ottawa.

Results obtained from the breeding stock this spring were very satisfactory. A total of fifteen litters gave 182 pigs farrowed and 123 raised which gives an average of 12.1 pigs farrowed per litter and 8.2 pigs raised. Five Berkshire sows gave an average of 13.6 pigs per litter and raised an average of 10.1. Five Tamworth sows gave an average of 11.6 pigs per litter and raised an average of 6.8. Five Yorkshire sows gave an average of 11.2 pigs per litter and raised an average of 7.8. Three of the fifteen sows had litters for the first time. The twelve mature sows dropped an average of 12.8 pigs per litter and raised an average of 8.2. The three young sows dropped an average of 9.3 pigs per litter and raised an average of 8.0. In 1924 the average litter for old sows was eleven pigs with eight raised, and for young sows, seven littered and five raised.

A fall litter of ten pigs was raised with which an experiment was started to find out whether any advantage could be gained by the feeding of a mineral mixture consisting of fine coal dust, salt, air-slaked lime, sulphur and bone meal to pigs in the winter time when they are unable to get for themselves any mineral from the earth.

A straw stack was not available for sleeping quarters for the breeding stock during the winter of 1924-25 and consequently the sows and boars were wintered in the open corrals each 40 feet by 80 feet. They were protected from the wind and snow by 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. The part of the corral under the shelter was kept well bedded throughout the winter.

The breeding herd was kept in a thrifty condition but not fat throughout the winter on a ration consisting of three parts oats and one part barley with the addition of one per cent bone meal and ten per cent digester tankage.

Nearing farrowing time the sows were fed 5 pounds each per day. After farrowing, shorts and bran replaced barley-chop in the ration and the amount was gradually increased until at a month a maximum of ten pounds was fed. A mixture of charcoal, hydrated lime, bone meal and salt was placed in a box for the use of the sows during the winter.

During the summer the sows had the run of three-fourths of an acre of rape pasture and were supplied with fresh water and garbage but no meal. The boars had the run of a large brome grass pasture with access to water as in previous years. During November the breeding herd was fed meal so as to have the boars and sows gaining in weight preparatory to breeding.

PIG-FEEDING METHODS

An experiment was conducted during the past season with the following objects in view:—

1. To determine the value of tankage, Pro-lac and buttermilk as supplements to a grain ration with regard to type of hog and quality of carcass produced and in addition as to rate and economy of gains.
2. To compare self-feeding and heavy and limited hand-feeding as to their influence on these points under both pasture and dry-lot conditions.
3. To compare the Berkshire, Tamworth, Yorkshire and their crosses as bacon hogs.
4. To compare rape, corn and a mixture of oats, barley and wheat as pastures in the cost of production of the bacon hog.
5. To determine whether the use of pasture is conducive to the economical production of the bacon-type of hog as compared with dry-lot feeding without any green feed.

EXPERIMENTAL METHODS.—Pure-bred Berkshire, Tamworth, Yorkshire and crosses from these three breeds were used in the experiment. One hundred and ten pigs representing the breeds and crosses, were divided as equally as possible into eleven lots as follows:—

Lot 1. Grain and tankage, heavy hand-feeding, oat, wheat and barley pasture.
Lot 2. Grain and tankage, light hand-feeding, rape pasture.
Lot 3. Grain and tankage, self-feeder, rape pasture.
Lot 4. Grain—No protein supplement, light hand-feeding, rape pasture.
Lot 5. Grain—No protein supplement, light hand-feeding, corn pasture.
Lot 6. Grain and buttermilk, light hand-feeding, corn pasture.
Lot 7. Grain and Pro-lac, light hand-feeding, corn pasture.
Lot 8. Grain and tankage, light hand-feeding, corn pasture.
Lot 9. Grain and tankage, self-feeder, dry lot.
Lot 10. Grain and tankage, light hand-feeding, dry lot.
Lot 11. Grain—No protein supplement, light hand-feeding, dry lot.

The pigs were of litters farrowed between March 15 and May 4 inclusive and the lots were arranged as nearly equal in breed, weight, sex, age and general appearance as possible. Previous to the beginning of the test the feeding and management of all pigs was practically the same.

All lots were given the same basic ration, which at first consisted of three parts shorts and one part oat-chop. 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. In addition to the grain ration, lots number 1, 2, 3, 8, 9 and 10 were given eight per cent digester tankage; lot No. 6 was fed buttermilk at the rate of two pounds per pound of grain consumed; and lot No. 7 was fed one pound of Pro-lac per day. During the last three weeks of the experiment no supplements were fed.

The Pro-lac meal used in this test was manufactured by the Pro-lac Milling Company, Des Moines, Iowa, and is recommended as a substitute for skim-milk or buttermilk. One pound was mixed with 6½ imperial gallons of water and allowed to stand twelve hours in order to permit fermentation to begin. It was then added to the meal and the whole fed as a slop.

The hogs were weighed individually at the commencement of the test and on completion of the test. At monthly intervals each lot also was weighed and with the exception of lots No. 10 and 11 the ration for the light hand-fed hogs for the following month was based on these weights. At the commencement of the experiment lots 10 and 11 were fed the same amount of meal and shared a corresponding increase throughout the feeding period. The heavy-hand-fed hogs were given all they would clean up three times a day.

For the first month of the experiment 4½ pounds of meal mixture per day were fed for every hundred pounds of live weight. As the pigs increased in weight the amount consumed per hundred pounds live weight was decreased. One month before the completion of the test each lot was given all they would consume. The pasture plots used were three-quarters of an acre in area and were sown to a rape and grain mixture during the first week in May and to corn during the last week in May. At the time the experiment was started, the grain was in the shot-blade and the rape and corn about twelve inches high. The grain plot was devoid of eatable forage by September 1, and the corn pasture by September 15. The rape provided pasture late in the season, there being plenty of forage available when the experiment closed on November 1. A grove of caragana 50 feet wide provided shelter at the northern end of the pastures. 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.

The meal was fed dry to all lots with the exception of lot 7. A mineral mixture of charcoal, hydrated lime, bone-meal and salt were before all lots constantly and in addition they received all the water they would drink. The hogs were marketed on completion of the experiment on November 1.

		Lot 1 Tankage, heavy feeding, wheat, oat and barley pasture	Lot 2 Tankage, limited feeding, rape pasture	Lot 3 Tankage, self feeder, rape pasture	Lot 4 No protein, limited feeding, rape pasture	Lot 5 No pretein, limited feeding, corn pasture	Lot 6 Butter-milk, limited feeding, corn pasture	Lot 7 Pro-lac, limited feeding, corn pasture	Lot 8 Tankage, limited feeding, corn pasture	Lot 9 Tankage, self-feeder, dry lot	Lot 10 Tankage, limited, feeding, dry lot	Lot 11 No protein, limited feeding, dry lot
Number of hogs in experiment		10	10	10	10	10	10	10	10	10	10	10
Initial weight, gross	lbs.	595	634	524	587	597	616	613	628	601	566	527
Initial weight, average	"	59·5	63·4	52·4	58·7	59·7	61·6	61·3	62·8	60·1	56·6	52·7
Finished weight, gross	"	1,950	2,030	1,970	1,890	1,690	2,250	1,860	1,870	2,130	1,880	1,600
Finished weight, average	"	195·0	203·0	197·0	189·0	169·0	225·0	186·0	187·0	213·0	188·0	160·0
Number of days in experiment		115	115	115	115	115	115	115	115	115	115	115
Total gain for period	lbs.	1,355	1,396	1,446	1,303	1,093	1,634	1,247	1,242	1,529	1,314	1,073
Average gain per animal for period	"	135·5	139·6	144·6	130·3	109·3	163·4	124·7	124·2	152·9	131·4	107·3
Average daily gain per animal	"	1·18	1·21	1·26	1·13	0·95	1·42	1·08	1·08	1·33	1·14	0·93
Amount of meal eaten by group	"	7,064	6,132	7,824	6,028	6,080	5,668	6,132	6,132	8,922	6,725	6,725
Amount of tankage consumed by group	"	453	388	497					388	505	429	
Amount of Pro-lac consumed by group	"							100				
Amount of buttermilk consumed by group	"						11,770					
Cost of protein supplement per lot	$	10 19	8 73	11 18			11 77	6 00	8 73	11 36	9 65	
Amount of meal eaten per pound gain	lbs.	5·21	4·39	5·41	4·52	5·56	3·47	4·92	4·94	5·83	5·12	6·27
Amount of tankage per pound gain	"	0·33	0·27	0·34					0·31	0·33	0·33	
Amount of Pro-lac per pound gain	"							0·08				
Amount of buttermilk per pound gain	"						7·20					
Total cost of feed	$	125 68	108 73	138 05	98 11	99 04	104 37	105 99	108 72	155 58	119 06	109 41
Cost of feed per head	$	12 57	10 87	13 80	9 81	9 90	10 44	10 60	10 87	15 56	11 91	10 94
Cost of feed per head per day	cents	10·93	9·45	12·00	8·53	8·61	9·08	9·22	9·45	13·53	10·36	9·51
Cost to produce one pound gain	"	9·28	7·79	9·55	7·53	9·06	6·39	8·50	8·75	10·17	9·06	10·19

Cost of Feeds

Tankage.....$45 per ton
Pro-lac.....$6 per cwt.
Buttermilk.....1 cent per gallon.
Oats.....65 cents per bushel.
Barley.....70 cents per bushel.
Shorts.....$34 per ton.

DEDUCTIONS.—1. *Methods of Feeding.*—In this test the comparison of average results of self-feeding and heavy hand-feeding shows the self-fed lots to have made the greater gains but with a higher meal consumption and also at a higher cost. These results are in accord with a former test conducted during the previous year. The costly gains made by the self-fed pigs, may be attributed, in part at least, to the fact that they made very little use of the pasture available. It was observed throughout the feeding period that the self-fed pigs helped themselves to the meal ration many times during the day, thus being "full-fed" at all times, while the hand-fed pigs took more exercise and helped themselves to more of the green forage. With the exception of the buttermilk-fed pigs, the lots self-fed were more even in size but did not conform to the bacon type as closely as those in the other lots. The third highest daily gains were made by the lot heavily trough-fed. These gains, among those fed protein supplements, required more meal per 100 pounds of gain than any of the lots lightly fed.

2. *Protein Supplements.*—In every case when the difference in feed was only a difference in protein supplement, those fed the protein supplement made greater gains and at a lower cost per hundred pounds gain than did those which had no protein supplement.

Lots 6, 7 and 8 on corn pasture receiving a protein supplement made greater average daily gains with a considerable lower feed cost than lot 5 on a similar pasture without protein. On the average, the pigs fed a protein supplement on corn pasture required 112 pounds less meal for each 100 pounds of gain than those fed the meal ration only.

In comparing lot 5 with lot 6, it will be seen that the lot receiving buttermilk made 0.47 pound higher daily gains and produced these gains at a cost of 2.67 cents less per pound than the lot without protein supplement.

In comparing lot 5 with lot 7, it will be seen that the lot receiving Pro-lac made 0.13 pound higher daily gains and produced these gains at a cost of 0.56 cents less per pound than the lot without a protein supplement.

A comparison of lot 6 with lots 7 and 8 shows that the buttermilk-fed pigs made 0.34 pound higher daily gains and produced these gains at a cost of 2.11 cents less per pound than the Pro-lac-fed lot and made 0.34 pound higher daily gains and produced these gains at a cost of 2.36 cents less per pound than the tankage-fed lot. A feature brought out in this test is the economy of gains and the high daily gains made by the lot fed buttermilk in addition to the main ration. This lot made the greatest gains as well as the most economical gains of all the lots on test. This would indicate that buttermilk at 1 cent a gallon is a more economical feed with which to supplement the meal ration than is either Pro-lac or tankage at their present high prices. However, where buttermilk is not available, Pro-lac or tankage rank high as substitutes and should be fed as supplements in a ration lacking milk. In addition, the buttermilk-fed hogs showed greater uniformity, were smoother in appearance and possessed more gloss in hair than the other lots. There was, however, a slight tendency for the buttermilk-fed hogs to become over-fat.

In comparing lot 7 fed Pro-lac, and lot 8 fed tankage, it is seen that the results show very little difference either in respect to cost per pound of gain or to daily gains made.

In comparing lots 2 and 4, one finds that the lot receiving tankage made slightly greater gains with the consumption of less meal per pound gain than the lot receiving no tankage.

A comparison of light hand-feeding of meal only, with light hand-feeding of meal and tankage in dry lot, shows the tankage-fed pigs to average 0.21 pound higher daily gains at 1.13 cents per pound lower cost than the hogs fed meal only. The use of tankage 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. The lot not fed tankage not only made the poorest showing of all the lots, with low daily gains and amount of meal to make these gains, but they had a dry hair, developed unevenly, and persisted in rooting up their lots. These results would seem to indicate that pigs fed a meal ration only in dry lot are incapable of producing economical gain.

3. *Pasture.*—In all cases but one, where pasture and no pasture was the only difference, lots on pasture made greater gains at a lower cost per hundred pounds than did those without pasture. The exception was in the self-feeder lots. The self-feeder lot with tankage on rape pasture made lower gains but more economical gains than did the lot on self-feeder with tankage in dry lot. In 1924 when a similar comparison was made, except that there was no protein supplement given either lots, those on rape pasture made both greater and more economical gains than did those in dry lot. On the average, lots 2, 3 and 8 fed tankage on pasture required 55.5 pounds less meal for each 100 pounds gain than those fed tankage in dry lot. This means that it cost 90.5 cents more per 100 pounds gain to feed inside. Lots 4 and 5 fed the meal ration only on rape pasture required 123 pounds less meal for each 100 pounds gain than lot 11 fed the meal ration only in dry lot. This means that it cost $1.98 more per 100 pounds of gain to feed inside. Furthermore, the pigs on pasture were more evenly fleshed and possessed more gloss in hair, giving them a more thrifty appearance, than the pigs in dry lot. The coats of the latter were coarse; this being particularly true of the lot fed the meal only.

A comparison of lots 2 and 8 shows the lot on rape pasture made 0.13 higher daily gains and produced these gains at a cost of 0.96 cents less per pound than the lot on corn pasture. A comparison of lots 4 and 5 shows the lot on rape pasture made 0.18 higher daily gains and produced these gains at a cost of 1.70 cents less per pound than the lot on corn pasture. These results in favour of rape pasture may, in part at least, be due to the higher protein content of the rape as compared with corn and also to the ability of the rape pasture to "carry on" later in the season than the corn. It is worthy of note also that a season such as 1925 with its plentiful moisture supply was more favourable to rape than corn, whereas, in the dry season of 1924 corn was the only pasture to stand the dry weather.

A point not indicated in the table was the unevenness of maturity of the pigs fed the meal ration only. Of the twenty-one pigs that were not up to 170 pounds at the close of the experiment, sixteen were from lots fed no protein and of these, ten were without pasture.

4. *Weights at Close of Experiment.*—Of the one hundred and ten pigs on experiment, twenty graded select; but owing to an accident at the abbatoir their identity was lost. The following table shows the weights according to lots:—

WEIGHTS OF PIGS IN THE VARIOUS LOTS

Lot Number	Under 170 lbs.	Between 170 and 230 lbs.	Over 230 lbs.
1	1	8	1
2	0	9	1
3	0	10	0
4	1	9	0
5	5	5	0
6	0	8	2
7	2	8	0
8	2	8	0
9	0	8	2
10	3	7	0
11	7	3	0

TABLE SHOWING WEIGHTS ACCORDING TO BREEDS

Name	Under 170 lbs.	Between 170 and 230 lbs.	Over 230 lbs.
Berkshire	8	21	0
Yorkshire	0	4	2
Tamworth	5	28	1
Tamworth X Berkshire	3	16	2
Tamworth X Yorkshire	5	14	1

SUMMARY.—1. Self-fed pigs make greater gains but not so economical gains as hand-fed pigs.

2. Self-fed pigs make very little use of pasture and, when hand-fed, the amount of pasture used varies in inverse ratio to the amount of grain fed.

3. The use of a protein supplement resulted in greater gains in every case and in mose economical gains in every case; except on rape pasture. Where protein supplement was used the pigs were more thrifty in appearance and conformed more closely to bacon types.

4. Buttermilk proved superior to either Pro-lac or Tankage and there was practically no difference between the latter two.

5. Pigs on pasture made greater and more economical gains than pigs on dry lot and the relative value of pastures were: first rape, second corn, and third grain. In 1924 corn was the only pasture that survived the dry weather.

6. Ability to make gains depends more upon strain than upon breed.

In this test there were no Berkshires classed as "Heavy" and no Berkshires nor Berkshire crosses classed as "Select."

FIELD HUSBANDRY

This season was nearly ideal for all farm crops and with few exceptions all yields were above average.

Following a winter of average snowfall the weather until the first of June was fairly dry enabling the farmers to do their sowing with small loss of time and while the soil was in good condition. Commencing about the first of June an unusual amount of rain fell during that month and until about the middle of July, insuring a crop by supplying it with moisture when the greatest growth was taking place. During the latter part of July and early August a short period of hot, dry weather proved detrimental to early sown and early varieties of grain causing early maturity and small shrunken grain. The period from the middle of August to the end of October was very wet. This delayed harvest and threshing and caused a high percentage of the grain to be threshed tough thus lowering the grade and value. The delay in threshing also resulted in a small percentage of fall ploughing being done.

The yields of wheat and oats were above average, but barley, which was in the milk stage during the hot weather of July and August, produced a shrunken kernel and only average yield.

Ensilage crops made an excellent growth and the yields were well above average. Due to poor permination the stand of corn was poor and the resulting yield lower. It also lacked in maturity due to high precipitation.

The yield of swede turnips on Rotation R. was the highest ever produced at this station on areas larger than one acre. The roots were also of good size and excellent quality but due to the high cost of harvesting, showed a loss in cost of production.

The tame hay crop of western rye grass was excellent and showed a decidedly higher yield in favour of the two-year-old seeding.

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

Return Values

	$ c.
Wheat—per bushel	1 32
Barley—per bushel	64
Oats—per bushel	0 48
Western rye grass hay	9 00 per ton
Oat and barley straw	2 00 per ton
Sunflowers for ensilage	3 00 per ton
Corn for ensilage	3 00 per ton
Turnips	1 50 per ton

Cost Values

Rent	3 00 per acre
Barnyard manure	1 00 per ton
Seed wheat	2 00 per bu.
Seed oats	0 80 per bu.
Seed barley	1 00 per bu.
Seed turnips	0 90 per lb.
Sunflowers	0 15 per lb.
Seed western rye grass	0 07 per lb.
Seed corn	0 085 per lb.
Machinery	1 50 per acre
Horse labour single horse	0 08 per hr.
Manual labour	0 25 per hr.
Threshing wheat	0 15 per bu.
Threshing oats	0 12 per bu.
Threshing barley	0 13 per bu.
Twine	0 17 per lb.
Tractor operator	0 80 per hr.
Use of tractor	0 52 per hr.
Rent of ensiling machinery	0 18 per ton

COST OF GROWING WHEAT PER ACRE

—	Rotation—R—Following hoed crop	Rotation—R—Following fallow	Rotation—J2—Following hay	Rotation—J2—Following hoed crop	Rotation—P—Following fallow	Rotation—P—Following wheat	Rotation—5 yr.—Following Sunflowers	Rotation—J—Following fallow	Rotation—J—Following wheat	Rotation—C—Following fallow	Rotation—C—Following wheat
	$ 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
Machinery	1 50	1 50	1 50	1 50	1 50	1 50	1 50	1 50	1 50	1 50	1 50
Manure	1 71	1 71	2 00	2 00	2 00	2 00	2 40	.....	.....	.....	.....
Ploughing	1 25	.....	1 37	1 25	.....	1 20	1 25	.....	1 31	.....	1 14
Cultivating	.....	.....	0 34	.....	0 34	.....	.....	0 34	.....	.....	.....
Packing	0 28	0 28	0 68	0 28	0 28	.....	0 57	0 34	0 17	0 28	0 28
Harrowing	0 23	0 23	.....	0 23	.....	0 23	.....	.....	0 23	0 23	0 23
Seed	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00	3 00
Seeding	0 29	0 29	0 29	0 29	0 29	0 29	0 29	0 29	0 29	0 29	0 29
Cutting	0 28	0 28	0 28	0 28	0 28	0 28	0 28	0 28	0 28	0 28	0 28
Stooking	0 15	0 15	0 15	0 15	0 15	0 15	0 15	0 15	0 15	0 15	0 15
Twine	0 65	0 58	0 41	0 65	0 58	0 58	0 54	0 54	0 51	0 54	0 48
Threshing	6 03	4 92	3 39	5 40	5 85	5 34	5 17	4 51	4 59	5 22	4 92
Cost of fallow	3 00	5 13	.....	.....	5 97	2 98	.....	5 73	2 87	4 22	2 10
Cost per acre	21 37	21 07	16 41	18 03	23 24	20 55	18 15	19 68	17 90	18 71	17 37
	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.
Yield per acre in bu	40·2	32·8	22·6	36·0	39·0	35·6	34·5	30·1	30·6	34·8	32·8
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Value per acre at $1.32	53 06	43 30	29 83	47 52	51 48	46 99	45 54	39 73	40 39	45 93	43 30
Cost per bushel	0 53	0 64	0 73	0 50	0 59	0 58	0 53	0 65	0 58	0 54	0 53
Profit per acre	31 69	22 23	13 42	29 49	28 24	26 44	27 39	20 05	22 49	27 22	25 93

COST OF GROWING OATS AND BARLEY PER ACRE

	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 hoed crop	Totation —5 yr.— Following oats
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Rent	3 00	3 00	3 00	3 00	3 00	3 00	3 00
Machinery	1 50	1 50	1 50	1 50	1 50	1 50	1 50
Manure	1 71	1 71	2 00	2 40	.....	2 00	2 40
Ploughing	1 25	1 25	1 25	1 25	1 32	1 25	1 25
Packing	.....	.....	.....	0 28	.....	.....	.....
Cultivating	.....	.....	0 34	.....	.....	.....	.....
Harrowing	0 46	0 46	0 23	0 69	0 48	0 46	0 46
Seed	1 60	1 60	1 60	1 60	1 60	2 00	2 00
Seeding	0 29	0 29	0 29	0 29	0 29	0 29	0 29
Cutting	0 28	0 28	0 28	0 28	0 28	0 28	0 28
Stooking	0 15	0 15	0 15	0 15	0 17	0 15	0 15
Twine	0 68	0 68	0 61	0 61	0 59	0 54	0 48
Threshing	8 23	11 04	9 55	10 46	11 39	5 15	4 39
Cost of fallow	.....	2 56	.....	.....	.....	2 66	.....
Cost per acre	19 15	24 52	20 80	22 51	20 62	19 28	16 20
	bu.	bu.	bu.	bu.	bu.	bu.	bu.
Yield per acre—bu	68 6	92·0	79·6	87·2	94·9	39·6	33·8
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Yield per acre—straw—tons	1 82	1 44	2 27	1 54	1 52	1 20	0 81
Value per acre—oats at 48c., barley at 64c., and straw $2 per ton	36 57	47 04	42 75	44 94	48 59	27 74	23 25
Cost per bushel	0 28	0 27	0 26	0 26	0 22	0 49	0 48
Profit per acre	17 42	22 52	21 95	22 43	27 97	8 46	7 05

COST OF GROWING TURNIPS PER ACRE

	Rotation —R— Following fallow	Rotation —P— Following fallow
	$ cts.	$ cts.
Rent	3 00	3 00
Machinery	1 50	1 50
Manure	1 71	2 00
Cultivating	0 28	0 34
Seed	2 88	2 70
Seeding	0 25	0 25
Scuffling	.....	0 41
Hoeing	8 10	8 00
Pulling and putting in cellar	34 32	22 41
Cost of fallow	6 00	5 31
Cost per acre	58 04	45 92
	Tons	Tons
Yield per acre in tons	34·99	22·80
	$ cts.	$ cts.
Value per acre at $1.50 per ton	52 48	34 20
Cost per ton	1 66	2 01
Profit per acre	.....	.....
Loss per acre	5 56	11 72

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.— Corn Following hay	Rotation —J2— Corn Following wheat
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Rent	3 00	3 00	3 00	3 00	3 00
Machinery	3 33	3 49	4 02	3 67	2 94
Manure	1 71	2 00	2 00	2 40	2 00
Ploughing	.....	1 25	.....	1 37	1 25
Cultivating	0 28	0 34	0 34	0 34	0 34
Seed	2 40	1 50	2 40	1 70	1 70
Seeding	0 25	0 24	0 25	0 21	0 24
Scuffling	29	0 57	0 41	0 57	0 57
Hoeing	5 70	5 40	4 80	5 55	2 70
Cutting	0 79	0 79	0 79	0 79	0 79
Twine	1 16	1 02	1 09	1 22	1 09
Ensiling	11 08	12 29	15 44	11 03	8 68
Cost of fallow	6 00	.....	5 31	.....	.....
Cost per acre	35 99	31 89	39 85	31 85	25 30
	Tons	Tons	Tons	Tons	Tons
Yield per acre—tons	10 16	11 07	14 01	12 04	8 01
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Value per acre at $3.00 per ton	30 48	33 21	42 03	36 12	24 03
Cost per ton	3 54	2 88	2 84	2 64	3 16
Profit per acre	.....	1 32	2 18	4 27	.....
Loss per acre	5 51	.....	.....	.....	1 27

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 crop. 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 R, YEAR 1925—NUMBERS OF YEARS DURATION, NINE
Summary of Yields, Value and Profit and Loss (per acre)

Rotation year	Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss	
						Per acre	
		1925	Average thirteen years			1925	Average thirteen years
		tons	tons	$ cts.	$ cts.	$ cts.	$ cts.
1	Summer-fallow	.....	.....	.....	9 00	−9 00	−7 23
2	Turnips—4-year average	34·99	21·45	52 48	52 04	0 44	2 18
3	Sunflowers or corn	10·16	7·87	30 48	29 99	0 49	11 79
		bush.	bush.				
4	Wheat	40·2	28·5	53 06	18 37	34 69	15 68
5	Oats	68·6	54·3	36 57	19 15	17 42	8 84
6	Summer-fallow	.....	.....	.....	7 69	−7 69	−6 02
7	Wheat	32·8	30·9	43 30	15 95	27 35	15 77
8	Oats—Seeded down	92·0	53·9	47 04	21 96	25 08	8 82
		tons	tons				
9	Hay	1·75	0·56	15 75	8 10	7 65	−0 08
10	Hay	2·75	0·96	24 75	8 65	16 10	2 76
	Totals for rotation	.....	.....	303 43	190 90	112 53	52 51
	Average per acre	.....	.....	30 34	19 09	11 25	5 25

ROTATION—J2—YEAR 1925—NUMBER OF YEARS DURATION, SIX

Summary of Yields, Value and Profit and Loss (per acre)

Rotation year	Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss	
		1925	Average five years			Per acre	
						1925	Average five years
		bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
1	Wheat	22·6	18·6	29 83	16 41	13 42	5 57
		tons	tons				
2	Sunflowers	11·07	8·68	33 21	31 89	1 32	7 40
3	Corn—4-year average	8·01	7·81	24 03	25 30	−1 27	1 89
		bush.	bush.				
4	Wheat	36·0	20·5	47 52	18 04	29 48	8 19
5	Oats—Seeded down	79·6	48·4	42 75	20 80	21 95	4 85
		tons	tons				
6	Hay	1·28	0·71	11 52	8 14	3 38	0 67
7	Hay	1·49	0·55	13 41	8 27	5 14	1 14
	Totals for rotation			202 27	128 85	73 42	29 71
	Average per acre			28 90	18 41	10 49	4 24

ROTATION—P—YEAR 1925—NUMBER OF YEARS DURATION, EIGHT

Summary of Yields, Value and Profit and Loss (per acre)

Rotation year	Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss	
		1925	Average thirteen years			Per acre	
						1925	Average thirteen years
		bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
1	Summer-fallow				8 95	−8 95	−6 25
2	Wheat	39·0	27·7	51 48	17 27	34 21	14 32
3	Wheat	35·6	19·2	46 99	17 57	29 42	7 10
4	Summer-fallow				7 97	−7 97	−6 32
		tons	tons				
5	Sunflowers—4-year average	14·01	13·18	42 03	34 54	7 49	4 40
6	Turnips	22·80	13·27	34 20	40 61	−6 41	16 22
		bush.	bush.				
7	Barley—seeded down	39·6	38·3	27 74	16 62	11 12	7 92
		tons	tons				
8	Hay	1·98	0·69	17 82	8 52	9 30	0 02
9	Hay	2·23	0·85	20 07	8 67	11 40	2 23
	Totals for rotation			240 33	160 72	79 61	39 64
	Average per acre			26 70	17 86	8 84	4 40

ROTATION—FIVE YEAR—YEAR 1925—NUMBER OF YEARS DURATION, FIVE

Summary of Yields, Value and Profit and Loss (per acre)

Rotation year	Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss	
		1925	Average four years			Per acre	
						1925	Average four years
		tons	tons	$ cts.	$ cts.	$ cts.	$ cts.
1	Corn	12·04	8·90	36 12	31 85	4 27	0 73
		bush.	bush.				
2	Wheat	34·5	22·2	45 54	18 15	27 39	8 28
3	Oats	87·2	54·8	44 94	22 51	22 43	7 23
4	Barley—seeded down	33·8	28·2	23 25	16 20	7 05	−0 10
		tons	tons				
5	Hay	1·36	0·63	12 24	9 13	3 11	−2 11
	Totals for rotation			162 09	97 84	64 25	14 03
	Average per acre			32 42	19 57	12 85	2 81

ROTATION—J—YEAR 1925—NUMBER OF YEARS DURATION, SIX

Summary of Yields, Value and Profit and Loss (per acre)

Rotation year	Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss	
		1925	Average thirteen years			Per acre	
						1925	Average thirteen years
		bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
1	Summer-fallow				8 60	−8 60	−6 10
2	Wheat	30·1	25·1	29 73	13 95	25 78	14 82
3	Wheat	30·6	18·6	40 39	15 03	25 36	8 02
4	Oats—seeded down	94·9	38·6	48 59	20 62	27 97	6 14
5	Oats—replacing hay	50·0	0·35	27 04	14 95	12 09	1 47
		tons	tons				
6	Hay	1·2	0·64	10 80	6 67	4 13	1 45
7	Cost of re-seeding hay which did not catch in 1924				1 05	−1 05	
	Totals for rotation			166 55	80 87	85 68	25 80
	Average per acre			27 76	13 48	14 28	4 30

ROTATION—C—YEAR 1925—NUMBER OF YEARS DURATION, THREE

Summary of Yields, Value and Profit and Loss (per acre)

Rotation year	Crop	Yield per acre		Value of crop 1925	Cost of production 1925	Profit or loss	
		1925	Average three years			Per acre	
						1925	Average three years
		bush.	bush.	$ cts.	$ cts.	$ cts.	$ cts.
1	Summer-fallow				6 32	−6 32	−7 34
2	Wheat	34·8	23·6	45 93	14 50	31 43	15 59
3	Wheat	32·8	21·5	43 30	15 27	28 03	11 59
	Totals for rotation			89 23	36 09	53 14	19 84
	Average per acre			29 74	12 03	17 71	6 61

CULTURAL EXPERIMENTS

DATES OF SOWING

The following four tables give the results for two years of an experiment on dates of sowing of the common cereals. Commencing as early as possible in the spring, sowings are made at intervals of several days and continued over a period in which these grains may be sown.

DATES OF SEEDING WHEAT

Date sown	Number of days maturing	Yield per acre in bushel and pounds			
		1925		Two-year average	
		bush.	lb.	bush.	lb.
April 16	120	35	20	26	..
" 20	119	35	11	25	55
" 27	115	34	42	25	51
" 30	114	29	35	22	37
May 3	113	29	47	21	43
" 7	112	29	15	20	37
" 11	111	28	25	20	42
" 14	112	29	..	21	50
" 18	112	28	11	21	21
" 21	113	27	47	20	56

NOTE.—These results are for two years only and are therefore inconclusive. They indicate, however, both for the current year and for the average, that the earlisr sowings will yield considerably higher than will the late sowings and that the reduction of yields is in proportion to the delay in date of seeding.

DATES OF SEEDING OATS

Date sown	Number of days maturing	Yield per acre			
		1925		Two-year average	
		bush.	lb.	bush.	lb.
April 16	103	85	30	56	33
" 20	99	91	26	57	12
" 27	92	94	20	60	28
" 30	89	85	10	59	14
May 4	87	90	..	62	12
" 7	84	80	20	58	28
" 11	81	78	28	58	08
" 14	82	75	21	56	21
" 18	80	77	22	55	10
" 21	82	66	24	49	14

NOTE.—To date the results are rather contradictory and necessarily inconclusive. This season's returns, however, indicate that the best yields are obtained from seedings between the middle of April and the end of the first week in May. After this there is a sharp falling off in yield which increases with the delay.

DATES OF SEEDING BARLEY

Date sown	Number of days maturing	Yield per acre			
		1925		Two-year average	
		bush.	lb.	bush.	lb.
April 16	103	56	32	34	18
" 20	99	57	44	34	38
" 27	92	55	20	34	42
" 30	89	53	16	35	30
May 4	87	57	24	37	37
" 7	84	59	16	38	41
" 11	81	55	40	36	22
" 14	82	55	06	35	08
" 18	80	46	32	29	34
" 21	82	50	20	31	47

NOTE.—These results are for two years only and therefore not conclusive. They indicate, however best time to sow barley is during the first two weeks in May.

DATES OF SEEDING FLAX

Date sown	Yield per acre			
	1925		Three-year average	
	bush.	lb.	bush.	lb.
April 16	Destroyed		10	13
" 24	12	28	12	08
" 30	14	36	12	46
May 7	16	14	12	18
" 14	17	28	11	14
" 28	16	44	9	46

NOTE.—We cannot draw any definite conclusions from three years' results; but would infer that the best time to sow flax is about the second or third week after work commences in the spring. Young flax is very easily injured by frost and should not be sown too early for this reason.

RATES OF SEEDING CEREALS

The object of these experiments is to determine the rate at which each of the cereal crops must be seeded in order to obtain the maximum yields. Duplicate plots are sown at each rate for each cereal. The following are the results to date.

RATES OF SEEDING WHEAT

Rate of seeding per acre	Yield per acre			
	1925		Two-year average	
bushels	bush.	lb.	bush.	lb.
0·5	19	..	15	20
1·0	29	07	21	23
1·5	31	59	22	19
1·75	30	40	22	20
2·0	31	20	19	40
2·5	30	16	21	28

NOTE.—These results being for two years only can not be regarded as final. They indicate, however, that the maximum yield results from a seeding of either 1·5 or 1·75 bushels per acre.

RATES OF SEEDING OATS

Rates of seeding per acre	Yield per acre			
	1925		Two-year average	
bushels	bush.	lb.	bush.	lb.
0·5	65	30	39	04
1·0	70	..	40	10
1·5	72	32	39	24
2·0	78	28	43	08
2·5	81	06	45	15
3·0	75	30	42	22

NOTE.—The indication from the average and the current year's results is that a seeding of 2·5 bushels per acre will give the maximum yield; but as these results refer only to two years, they must be used with some reserve.

RATES OF SEEDING BARLEY

Rate of seeding per acre	Yield per acre			
	1925		Two-year average	
bushels	bush.	lb.	bush.	lb.
0·5	46	12	27	09
1·0	45	40	27	04
1·5	49	28	29	33
2·0	49	28	30	15
2·5	50	..	31	12
3·0	52	24	32	44

NOTE.—No conclusion can be drawn from this experiment since no rate of seeding per acre shows a maximum return. The yields increase with each increase of seeding.

RATES OF SEEDING FLAX

Rates of seeding per acre	Yield per acre			
	1925		Three-year average	
bushels	bush.	lb.	bush.	lb.
0·25	21	51	16	13
0·5	18	27	14	21
0·75	18	36	14	31
1·0	15	42	14	23

NOTE.—These results are somewhat inconclusive and contradictory; but indicate that the highest seeding gives a higher yield than the heavier seedings.

DEPTHS OF SEEDING FLAX

Flax was sown at various depths in order to ascertain the depth which would give the maximum yield of grain.

Depth of seeding	Yield per acre			
	1925		Three-year average	
inch	bush.	lb.	bush.	lb.
1	16	51	14	25
2	18	14	14	07
3	18	02	13	43
4	17	01	13	16

The average results show a gradual decrease in yield as the depth is increased and we would infer from this that flax should not be sown much over an inch deep.

DATES OF SOWING CORN AND SUNFLOWERS

These experiments were designed to discover the dates at which corn and sunflowers for ensilage should be sown to obtain the highest yields. Seedings were begun as soon as it was possible to get on the land and continued weekly for eight or nine weeks. It should be observed that the total weight of dry matter (water-free) and maturity of the crop are of greater importance than the total green weight at time of cutting.

DATES OF SOWING SUNFLOWERS

Time of Sowing	Green weight	1925 Moisture-free weight	Height	Maturity	1923-25 Average moisture-free weight for three years
	tons lb.	tons lb.	ft. in.		tons lb.
As early as possible	21 1,540	3 1,314	6 10	20% in bloom	2 1,368
One week later	16 680	3 477	6 5	20% in bloom	2 1,028
Two weeks later	14 615	2 952	6 3	12% in bloom	2 748
Three weeks later	16 235	2 1,318	6 ..	9% in bloom	2 432
Four weeks later	19 280	3 355	6 ..	6% in bloom	2 482
Five weeks later	19 1,685	3 192	6 4½	In bud	2 554
Six weeks later	18 1,420	2 1,665	6 7½	In bud	2 128
Seven weeks later	18 570	2 1,215	6 ..	In bud	1 1,710
Eight weeks later	20 950	2 1,361	6 ..	50% in bud	1 1,495
Nine weeks later	14 1,160	1 1,674	5 4½	20% in bud	1 1,674

DATES FOR SOWING CORN

Time of Sowing	Green weight	Moisture-free weight	Height	Maturity	Average moisture-free weight for two years
	tons lb.	tons lb.	ft. in.		tons lb.
As early as possible	18 895	2 600	6 4	Milk	3 1,107
One week later	18 760	2 1,441	6 4	Milk	4 572
Two weeks later	18 960	2 908	6 4	Milk	3 1,663
Three weeks later	18 1,355	2 961	6 ..	35% silked	3 1,903
Four weeks later	19 745	2 351	6 ..	Silks emerg.	3 652
Five weeks later	23 963	2 295	6 ..	Tasseled	2 145
Six weeks later	18 1,240	2 626	5 10½	Tasseled	. ..
Seven weeks later	17 1,020	2 540	5 11	Tasseled	. ..

The table for sunflowers covers in the average a normal year, a very dry year and a year of considerably more than normal rainfall. The average shows that the highest yields of dry matter are obtained from the earliest sowings.

The corn table covers only two years, and no final conclusion can be drawn from it; but the averages indicate that the highest yields and greatest maturity are obtained from corn sown between the last week in April and the middle of May.

DISTANCE OF PLANTING SUNFLOWERS

The effect on yield (moisture-free weight) of planting sunflowers in rows at various distances apart is being investigated in this experiment. Sunflowers were planted with the ordinary grain-drill in rows 6, 24, 30 and 36 inches apart, the first sowing being left unthinned, and the latter three being thinned to one foot between plants.

DISTANCE OF PLANTING ROWS OF SUNFLOWERS

Distance between rows	1925						1923–25 Moisture-free weight three-year average	
	Green weight		Moisture-free weight		Height			
Inches	tons	lb.	tons	lb.	ft.	in.	tons	lb.
6	20	1,480	3	1,412	3	10	2	1,780
24	21	1,015	3	1,686	7	6	3	380
30	20	630	3	152	7	9	2	1,580
36	16	780	2	930	7	6	2	920

These results for the three-year average show 24-inch spacing between rows to have a slight advantage over 6-inch spacing and 30-inch spacing. The 6-inch-spaced sowing was comparatively short and fine-stemmed, and was easily handled with the ordinary grain binder.

DISTANCE OF THINNING SUNFLOWERS

Distance between Plants in the Row	1925						1923–25 Moisture-free weight three-year average	
	Green weight		Moisture-free weight		Height			
In.	tons	lb.	tons	lb.	ft.	in.	tons	lb.
3 (Left as sowed)	17	1,375	2	1,836	5	9	3	180
6	17	697	3	485	6	1½	3	440
9	17	980	3	422	6	4½	..	....
12	17	1,801	3	421	6	9	2	1,580
15	17	1,575	3	218	6	10½	..	....
18	19	15	1	1,896	7	..	2	380

This table does not offer sufficient data for any definite conclusion to be drawn at present; but the averages indicate that little is to be gained by thinning plants in the row.

SUMMER-FALLOW SUBSTITUTE EXPERIMENT

In the table following is given a three-year average of crops used for summer-fallow substitute and also of the crop following, which was wheat in all cases. One-tenth acre plots were used for the experiment and all yields are given for one acre.

AVERAGE YIELDS PER ACRE FOR THREE YEARS—SUMMER-FALLOW SUBSTITUTE EXPERIMENT

Method of Sowing and Kind of Crop	Substitute crop yield		Yield of wheat following	
	bu.	lb.	bu.	lb.
Oats in double rows 36 in. apart	34	39	18	47
Oats in triple rows 30 in. apart	34	11	18	02
Barley in double rows 36 in. apart	18	11	19	15
Barley in triple rows 30 in. apart	21	22	19	55
Wheat in double rows 36 in. apart	16	05	21	45
Wheat in triple rows 30 in. apart	20	57	21	15
	Tons			
Corn in single rows 42 in. apart	10·96		22	45
Potatoes single rows 42 in. apart	5·96		22	28
Sunflowers single rows 42 in. apart	9·98		19	10
Sudan grass double rows 36 in. apart	3·22		24	..
Bare summer-fallow	....		21	17

The yield of wheat is outstandingly high following Sudan grass; but the yield of forage taken off the preceding season is low as compared with the other crop.

The wheat following potatoes and corn is also above that of bare summer-fallow, and while these results are for only three years and no definite conclusions can be drawn, we would infer that either Sudan grass in rows, corn or potatoes are as good as bare summer-fallow if kept clear of weeds.

The outstanding disadvantage of grain in rows when grown on land infested with weeds is that all weeds cannot be taken out with horse implements. With a single-row crop, this difficulty is partly eliminated and it may be used as a fallow substitute more generally.

HORTICULTURE

SEASONAL NOTES

A heavy snowfall during the winter of 1924 and 1925 gave splendid protection to the bulbs, currant bushes, ornamental shrubs and nursery stock. These, including the apple trees, came through the winter in good condition.

The vegetable and flower seeds which were sown in the open were practically all seeded between May 6 and 9. Some of the most tender varieties of vegetables which were sown in the hotbed were killed off during the middle of May. In the early part of June, seedlings of cucumbers, watermelon and muskmelon, which had been transplanted were destroyed by the cutworm which also worked on some varieties of lettuce, rhubarb and sweet peas after the seeds germinated.

Throughout the month of June growth was somewhat backward but the cool weather and abundant moisture were conducive to good germination and instrumental in developing a strong root-system. A rainfall of 5.9 inches during July and August resulted in a very strong plant-growth and the yield from beans, beets, carrots, celery, peas and parsnips was above the average.

The ornamental shrubbery, lawns and flower borders made a fine showing throughout the season. The most hardy varieties in the annual border were still blooming the first of October.

Five degrees of frost occurred on September 29 but not until October 3 was all annual growth destroyed.

VEGETABLES

ASPARAGUS

Asparagus is a fine source of early greens and is easily grown. A light dressing of hen-manure was applied to the asparagus plantation early in the spring.

The first cutting was made on May 21 and the season extended to June 20. The Washington variety grown on this Station produced an average of seven pounds per 30-foot row in 1925, which is also the average yield for the past three years.

ARTICHOKES

On May 11, tubers of the Jerusalem white variety were planted 14 inches apart in rows two feet apart. The tubers sprouted about May 26 and the yield when harvested on September 30 was 12 pounds for a 30-foot row. Fifty per cent of tubers were large and of excellent quality while the remainder were small but suitable for planting next spring. A four-year average yield is 16½ pounds.

BRUSSELS SPROUTS

Seed of the three varieties, Imperial Dwarf, Daniels Prize and Paris Market, were sown in flats in the cellar on April 3. The seed germinated about April 15 and the young plants were set out in the open on May 27. The sprouts were all small and poorly developed. The growing of Brussels sprouts has not met with success at this Station.

BORECOLE

Borecole is a hardy green used for boiling. Seed of the variety Green Curled Scotch was sown in the open on May 5 and germinated on May 18. A strong growth was made during the season and it was in good condition on November 30.

BEANS

VARIETIES.—Thirty-one varieties and selections of bush-beans were grown in 1925. The seeds were sown in rows two and one-half feet apart on May 7.

The first green beans were picked on July 20, and the season extended to September 1. The pods on twenty feet of each thirty-foot row were picked when ready to use as green beans. The remainder was left to ripen for seed and all varieties matured well this season.

The following varieties are to be recommended from a standpoint of yield, quality and earliness: Masterpiece, Stringless Green Pod, Bountiful and Extra Early Valentine. Four of the heaviest yielders this season had never been under test before and were Jones White (selection made at the Manitoba Agricultural College), Wills Bountiful, Interloper Challenge Wax (Ottawa 6950) and Stringless Green Pod (Ottawa 6877).

DATE OF SOWING.—A trial with successive dates of sowing a good standard variety was again conducted and the results are similar to the average of former years, which would indicate the first week of June to be the most satisfactory time to sow beans.

POLE- OR RUNNER-BEAN

The seed of five varieties of pole-beans was sown on May 9 and germinated on May 26. Early in June the cutworms destroyed all the seedlings of the Giant Podded Lima variety. The season extended from August 27 to September 19 and the yields of the following varieties, Daniels Long White, Dreer Golden Cluster, Improved Scarlet and No. 1 White were 72, 66, 41 and 32 pounds respectively for thirty-foot rows.

BROAD BEAN

On May 9 seed of Seville Long Pod and Aquadulce varieties was sown in rows two and one-half feet apart. When picked on September 18 a twenty-foot row of each variety yielded 10 to 15 pounds respectively. That which was left to ripen for seed was frozen.

BEETS

VARIETIES.—Ten varieties and selections were tested. The seed was sown in the open on May 6 in thirty-foot rows twenty-four inches apart. The seed germinated on May 22 and the plants were thinned on June 24. Graham Detroit Turnip, Bruce Early Model and McDonald Eclipse gave an average yield of 135 pounds. Roots of all these varieties were large and coarse. Two selections: 0-3494 and 0-6050, of the variety Detroit Dark Red, combined both smoothness and quality and gave an average yield of 108 pounds.

DISTANCE APART OF THINNING.—One variety was sown on May 22 and the plants thinned to 3, 4 and 6 inches apart in the row. Those thinned to 3 inches

yielded 99 pounds, 97 pounds where spacing was 4 inches and 92 pounds where spacing was 6 inches. These results are not in accord with those of last year. The explanation of this may be the difference of the two seasons. Wide spacing gives the best results in a dry year but for a year such as this the closer spacing gives the greatest yield of roots which are usually of superior quality.

DATES OF SOWING.—The first sowing of Detroit Dark Red variety was made on May 8 and three successive sowings followed at ten-day intervals. Following the order of sowing the yields were as follows: 91, 97, 68 and 58 pounds. The later sowings yielded superior quality roots for culinary purposes.

CABBAGE

In the case of early sown cabbage abundant moisture after the heads were well formed resulted in too rapid growth and approximately fifteen per cent of the well-developed heads were broken open. This materially reduced the yield of marketable cabbage.

VARIETY TEST.—Seed of twenty-two varieties and strains of cabbage was sown in the open on May 6. Of these, ten were sown in flats in the hotbed on April 9, pricked out on April 25 and transplanted to the open on May 27. In each case the rows were two and one-half feet apart with the plants left two feet apart in the row. The first heads were cut on July 24 from plants raised in the hotbed, and from those sown in the open on August 13. The total weight of 100 heads, ten heads from each of the ten varieties, was 872 pounds from the plants raised in the hotbed, and 798 pounds from the same varieties sown in the open.

The following are recommended and are listed in order of yield:—Copenhagen Market, Intermediate Danish Ballhead, Kildonan, New Flat Swedish and Early Jersey Wakefield.

DATE OF SOWING.—As a result of the abnormal growth due to the abundant rainfall during the early part of August the yield of marketable cabbage from the early sowings was reduced. However, the greatest total yield, including the feed-cabbage again came from the early sowing which was made on May 5 in the open

FIELD TRIALS.—Using seed of the Copenhagen Market variety an acre was sown with the grain-drill at the rate of two pounds per acre. This seed was sown on May 22, the plants thinned in the early part of July and the heads pulled on September 21. The yield was determined from a measured half-acre and yielded at the rate of 9 tons, 1,720 pounds of marketable cabbage per acre. The cost of seed, growing the crop and hauling to the cellar totalled $62.53 per acre or $6.34 per ton.

The results from last winter would indicate that cabbage can be kept in good condition until April when stored in a dark, well-ventilated cellar where the temperature can be maintained around 34 degrees, if hung to the ceiling by the roots or built upon slatted shelves in narrow piles two rows wide and three tiers deep. Cabbage is an excellent form of green feed for poultry.

CARROTS

VARIETIES.—Seed of six varieties and strains was sown in 30-foot rows on May 6 and germinated about May 22. The plants were spaced 3 inches apart in the row and the first bunches were picked on July 11. French Forcing and Ox Heart gave an average yield of 102 pounds. Both varieties were large and coarse. Two selections of Chantenay 0-3423 and 0-6049 and Nantes Half Long gave an average yield of 63 pounds. These latter varieties were of medium size and of good quality, having a small to medium-sized core.

DISTANCE OF THINNING.—Seed of two varieties was sown on May 6 and the plants thinned to 1, 2 and 3 inches apart in the row. The average yield of the two varieties favoured the closer spacing in proportion to the following yields 100, 75 and 73 pounds. The wider spacing yielded roots which were larger in size and of poorer quality.

DATE OF SOWING.—The first sowing was made on May 6 and was followed by three successive sowings. The following is the average yield from two varieties: 102, 80, 71 and 59 pounds. This again favours the early sowing for yield although roots from the later sowings were of finer quality.

An acre of cabbage sown with a grain-drill, spacing two and one-half feet between rows. Date of sowing May 22. Yield twenty-one tons.

CAULIFLOWER

VARIETIES.—Seed of six varieties and strains was sown in the open on May 5 and germinated about May 21. The rows were two feet apart and the plants spaced two feet apart in the row. From a 30-foot row Extra Early Dwarf Erfurt, Henderson Snowball, Danish Giant and Veitch Autumn Giant gave 41, 28, 28 and 24 pounds respectively.

Extra Early Dwarf Erfurt and Henderson Snowball sown in the hotbed and transplanted to the open on May 27 gave an average yield of 37 pounds against 34 pounds from the same varieties sown in the open and were ready for use on July 14, or three weeks earlier than those grown in the open.

CELERY

VARIETY TEST.—Seed of twelve varieties of celery and one of celeriac was sown in flats on April 3 and transferred from the cellar to the hotbed on April 9. The seed germinated about April 24 and the young seedlings were transplanted to the open during the first week of June. This test was conducted in single rows 3 feet apart with the plants set 6 inches apart in the row.

VARIETY TEST—CELERY

No.	Variety and Source of Seed	Average Weight of 12 Bunches
		Lb.
1	Paris Golden Yellow (Steele-Briggs)	35
2	Golden Self-blanching (McDonald)	28
3	Giant Pascal (McKenzie)	28
4	White Plume (Graham)	26
5	Winter Queen (Graham)	26
6	Fordhook Imp. (Vaughan)	26
7	Golden Self-blanching (McKenzie)	24
8	Easy blanching (McDonald)	24
9	New Golden (Ferry)	24
10	Early Blanching (Graham)	
11	Golden Plume (Morse)	22
12	Garrahans Easy Blanching (Garrahans)	19
13	Large Smooth Prague (Celeriac) (Steele Briggs)	41

SINGLE VS. DOUBLE ROWS.—Three varieties were used in conducting this experiment. The yield from thirty-six plants grown in the single row was 78 pounds as compared with 60 pounds from the double row.

STORING CELERY.—Celery stored in a dark, ventilated cellar and planted in soil 4 inches deep remained in good condition until March when the soil was moistened occasionally and a temperature around 34 degrees F. was maintained.

CUCUMBER

Owing to low temperatures in May and work of the cutworm early in June nearly all cucumber seedlings were killed. One plant of the variety Improved Long Green came through and gave a yield of thirty-eight fruits weighing 29 pounds.

CITRON

Seed of two selections of the Colorado variety was sown in small flower-pots and placed in the hotbed on April 23, transplanted on June 8 and when harvested, ten hills yielded twenty-nine fruits weighing 161 pounds.

CORN

Seed of nineteen varieties and selections of corn was sown on May 7. The seed germinated during the last week of May and the plants were thinned on June 24. Abundant moisture delayed maturity and it was not until September 8 that the garden corn was ready for use. The following varieties are early maturing and are recommended: Golden Bantam, Early Squaw, Pickaninny, Malakoff, Gehu and Early Malcolm. Gehu variety was sown as a field crop on May 18 and was ready for table use during the first week of September. A large percentage of this corn matured and was cobbed, husked and fed to poultry.

PEAS

VARIETIES.—Forty varieties and strains of garden peas were sown on May 8 in rows three feet apart and thirty feet long. The seed germinated about two weeks later. A trellis was provided by means of sticking branches in the ground on both sides of the row. As a result of the abundant rainfall many of the vines reached a height of five feet. Twenty feet of each row were picked as green peas and the remainder was harvested when ripe and threshed for seed. Based on a two-year average, Thos. Laxton, Peter Pan, Gradus 0-2348, Gradus x English Wonder 0-2346, Gregory Surprise x English Wonder 0-2342, Blue Bantam

and Gregory Surprise were ready for use ten weeks after planting and gave an average yield of 14 pounds of green peas per twenty-foot row. One week later Homesteader, Carter Daisy, Reliance, American Wonder and Danby Stratagem yielded an average of 19½ pounds. The seedlings developed at the Experimental Station at Invermere, B.C., have yielded an average for the past two years of 17½ pounds of green peas per twenty-foot row. The pods of these seedlings were well filled and the quality and the flavour of the peas was good.

Home-grown seed gave an average yield of twenty pounds and five ounces as compared with seventeen pounds and eight ounces from the same five varieties but from other sources.

DATES OF SOWING.—The first sowing of a selection of Thos. Laxton was made on May 8 and followed by two successive dates of sowing. The season for the early sowing extended from July 16 to July 27 and yielded 16½ pounds. That from the second sowing was used from July 20 to July 31 and gave a yield of 15 pounds. The last sowing made on May 28 produced 9 pounds of green peas from July 31 to August 7.

THICKNESS OF PLANTING.—Three varieties were sown on May 8. Each variety was sown 1, 2 and 3 inches apart. The following table gives the results together with a three-year average:—

Variety	Distance Apart	Ready for Use	Yield per 20-Foot Row		Three-year Average	
	Ins.		Lb.	Oz.	Lb.	Oz.
English Wonder	1	July 18	18	3	14	10
English Wonder	2	July 18	15	0	13	5
English Wonder	3	July 18	10	0	10	3
Thos. Laxton	1	July 18	17	14	12	5
Thos. Laxton	2	July 18	15	8	10	15
Thos. Laxton	3	July 18	14	7	8	15
Stratagem	1	Aug. 3	20	14	15	3
Stratagem	2	Aug. 3	14	11	13	5
Stratagem	3	Aug. 3	14	4	10	10

The spacing has no material effect on the date when ready for use for the closer plantings consistently give higher yields.

KOHL-RABI

The variety Giant Purple was sown in the open on May 6. When harvested on September 30 a thirty-foot row yielded 62 pounds. This vegetable is very little used.

LEEKS

Two varieties were grown in three different ways and in each case Mammoth Carentan outyielded Musselburgh. On the basis of a twenty-foot row, plants produced in the hotbed yielded 52 pounds compared with 31 pounds when sown in the open and transplanted, and 30 pounds when sown in the open but not transplanted.

Those which were transplanted were planted in a shallow trench and earthed up, thus producing leeks the stems of which were blanched more and thus of superior quality to those sown on the level.

LETTUCE

VARIETIES.—Fifteen varieties of lettuce were sown on May 6 in rows 18 inches apart. Seedlings of three varieties along a roadway were cut off by the cutworms. By June 6, Grand Rapids, Black Seeded Simpson and Salamander

were ready for use. All other varieties, with the exception of Cos which requires time to blanch before being ready for use, followed one week later. The season of the original plot rows was over by July 18, Hanson, Denver Market and Crisp as Ice having given the longest season for use.

On June 6 plants from eleven varieties were transplanted and spaced six inches aaprt in the row. This checked the growth of the plants and thus extended the season by ten days.

As a loose-leaf variety, Grand Rapids is among the earliest varieties but when flavour and crispness is desired, Denver Market, Hanson, Crisp as Ice and Iceberg are recommended.

ONIONS

VARIETIES.—Nineteen varieties and strains were sown in the open on May 9 in rows twelve inches apart. The seed germinated about May 26 and the young plants were thinned to 1½ inches apart in the row. All varieties were pulled on September 18 with the exception of White Barletta, a pickling onion which was pulled earlier. The table gives the results in 1925 and the average yield for six years from a thirty-foot row:—

TEST OF VARIETIES

Varieties	Yield 1925		Six-year Average	
	Lb.	oz.	Lb.	oz.
Southport Red Globe	16	8	17	14
Ailsa Craig	17	0	16	8
Southport Yellow Globe	28	0	15	13
Large Red Wethersfield	15	0	15	2
Southport White Globe	23	0	15	1
Extra Early Flat Red	23	8	14	3
Danvers Yellow Globe	19	0	13	4
Australian Brown	19	0	12	13
White Barletta	19	8	10	9
Cranston Excelsior	27	0	..	..

Had it not been for the ravages of the onion-maggot the yields in 1925 would have exceeded all previous records. The yields in the above table represent onions that were clean and Danvers Yellow Globe, Ailsa Craig, Large Red Wethersfield, are varieties particularly desirable.

CULTURAL TESTS.—Seed of Ailsa Craig, Cranston Excelsior and Large Red Wethersfield was sown in flats and placed in the hotbed on April 9. The seed germinated on April 16, seedlings were pricked out on April 29 and on June 6 transplanted to the open. Plants produced in the hotbed gave a yield of 31, 26 and 25 pounds as compared with 17, 27 and 15 pounds respectively when sown in the open.

Three rows of each of four varieties were sown and the plants spaced 1, 2 and 3 inches apart. The results favoured the closer spacing.

PARSNIPS

Six varieties or strains of parsnips were tested. Seed was sown on May 8 and the plants thinned on June 24 to four inches apart in the row. The following varieties are to be recommended: Hollow Crown O-6048, Guernsey, Hollow Crown O-3421 and Elcombe Hollow Crown. These are listed in order of quality, and yielded from a thirty-foot row 53, 56½, 48½ and 51 pounds respectively.

DISTANCE OF THINNING.—Two varieties were used in this test. Each variety was thinned to 3, 4 and 6 inches apart in the row and yielded an average of 50, 52 and 56 pounds respectively. A three-year average favours four-inch spacing.

PUMPKINS

Tests with pumpkins this year were made with plants started in four-inch flower-pots and placed in the cellar on April 20. They were transplanted to the open on June 8 and from one hill King of Mammoth (Graham), Connecticut Field (McDonald), Sugar (Graham), and Quaker Pie (McDonald), gave 353, 190, 105 and 25 pounds respectively. The heaviest specimen weighed 60 pounds and was picked from King of Mammoth but Connecticut Field is superior in quality.

Seed sown in the open either did not germinate or the cutworms destroyed the young seedlings before they came through the ground.

POTATO

A heavy yield of potatoes was harvested and the results were considerably higher than the average. Common scab (*Actinomyces scabies*) was present on some of the varieties, the Irish Cobbler being the worst affected but not so seriously as to reduce the yield. Field notes show most infection over the lower areas of the field.

As a summer-fallow substitute an acre of both Irish Cobbler and Early Ohio was planted in rows forty-two inches apart and the sets spaced fifteen inches apart in the row. This land had produced a crop of oats in 1924 and 1923. There was a small percentage of *Rhizoctonia solani*, commonly called black scurf, on these acre-plots and a few white blossom among the Irish Cobblers. The yield per acre of marketable potatoes from Early Ohio was 289 bushels and 292 bushels from Irish Cobblers. The closer spacing and more favourable soil of the experimental plots accounts for the greater yield obtained in the plots over that in the field.

The experimental work with potatoes was conducted on a rich sandy loam soil which had been summer-fallowed in 1924 and from which a corn crop was harvested in 1923. To offset the differences that might occur as a result of soil-variation the various tests were conducted in triplicate and each plot-row represented a different location in the field.

VARIETY TEST.—Eighteen varieties of potatoes were planted on May 13. Disease-free seed was used and the sets were planted fifteen inches apart in rows thirty inches apart and covered to a depth of four inches. All varieties were given similar and sufficient cultivation to keep down the weed growth.

Some of the varieties most highly recommended were among the lowest yielders. The first thing to consider in accounting for this discrepancy is the very favourable season for all varieties, but more particularly those of the late maturing group. As a result of the abundant moisture and the presence of the optimum factors for growth during June, July and August, there was a constant and rapid growth of the tubers. Thus maturity was hastened and by the first week of September the tops of the early varieties were ripe and recumbent. On the other hand the late varieties made a rapid increase until they were dug during the week of September 23. Considerable mosaic and a small percentage of leaf roll were found on some varieties and on July 17 all affected plants were rogued.

The following table gives the stage of maturity when harvested, the yields per acre in 1925 and some fifteen-year average yields:—

POTATO VARIETIES—YIELDS PER ACRE

Name of Varieties	Stage of Maturity	1925			15-Year Average in Bushels
		Large	Small	Total	
		Bu.	Bu.	Bu.	
Morgan Seedling	Immature	542	22	564	404
Rawling Kidney	Immature	650	35	685	398
Dreer Standard	Mature	606	8	614	393
Wee McGregor	Mature	671	24	695	392
Everitt	Mature	632	27	659	391
Moneymaker	Immature	630	20	650	390
Rochester Rose	Mature	600	22	622	373
Dalmeny Beauty	Mature	631	31	662	372
Empire State	Immature	598	21	619	371
Late Puritan	Immature	583	11	594	369
Carman No. 1	Mature	600	8	608	358
Reeves Rose	Mature	564	29	593	357
Vick Extra Early	Mature	602	30	632	348
Irish Cobbler	Mature	578	18	596	338
Early Ohio	Mature	500	33	533	305[1]
Bovee	Mature	458	31	489	265
Gold Nugget	Mature	460	33	493	278[2]
Up-to-Date	Immature	669	36	705	....

[1] Twelve-year average. [2] Five-year average.

The following varieties are recommended on the basis of their earliness of maturity, table-quality and average production: Early Ohio and Bovee are early varieties. They are red and pink respectively and both are oblong and smooth in outline.

Irish Cobbler and Gold Nugget are medium early varieties with creamy-coloured skin. The latter has shallow eyes and the skin is somewhat russet. It excels in table-quality. The former is more productive but is a little deeper in the eyes. This is one of the best varieties for winter use.

Empire State is a white oblong potato and is a good representative of the late varieties.

PLANTING WHOLE AND CUT POTATOES.—Different kinds of sets were planted on May 13. The tubers were dug on September 23. The table gives the average results from triplicate plot-rows together with a five-year average:—

WHOLE POTATOES VS. CUT POTATOES FOR SETS

Kind of sets	1925			Five-year Average
	Large	Small	Total	
	Bu.	Bu.	Bu.	Bu.
Whole Small Potatoes	649	54	703	375
Whole Medium Potatoes	597	48	645	360
One Eye from Seed-End	567	19	586	337
Two Eyes	537	15	552	351
Three Eyes	541	8	549	356
One Eye	517	21	538	337
One Eye from Stem-End	479	15	494	358
One Eye from Middle Portion	418	10	428	....

These results indicate a greater total yield from whole potatoes; but two things must be considered, the greater amount of seed required and the larger yield of small potatoes. These two factors would, no doubt, offset the greater yield obtained from whole potatoes. The results this year are not in accord with

the average or general opinion that stem-end outyields seed-end. Possibly there is little difference in the producing power of sets taken from these two parts of the tuber. Sets of two and three eyes outyield sets with one eye.

DISTANCE OF PLANTING.—Three plots of three rows each were planted at different distances, 12 by 30 inches, 14 by 33 inches, 16 by 36 inches (the last figure refers to the spacing between the rows). The results this year together with a twelve-year average are shown in the following table:—

Spacing	1925			Twelve-year Average
	Large	Small	Total	
	Bu.	Bu.	Bu.	Bu.
12 inches x 30 inches	478	52	530	378
14 inches x 33 inches	454	36	490	368
16 inches x 36 inches	440	30	470	343

Although a twelve-year average favours the closer spacing in point of total yield, yet it is well to remember that it also gives a larger percentage of small potatoes. Fifteen inches apart in the row with rows thirty inches apart is possibly the best spacing if potatoes are planted in soil which is in good tilth.

DATE OF PLANTING.—The first planting was made on May 7 followed by four successive dates at ten-day intervals. The plot planted on May 17 gave the heaviest yield and the last planting on June 16 gave the smallest yield.

DATE OF DIGGING.—Irish Cobbler potatoes were dug on seven dates of ten-day intervals. The yield increased from 106 bushels on July 21 to 596 bushels on September 23. The increase was uniform throughout the season. These diggings furnish potatoes to conduct the experiment "Mature vs. Immature Potatoes for Sets".

SPROUTED SEED.—Potatoes for lot one were kept in a cool cellar where they did not sprout. Lot two was exposed to light and heat for six weeks previous to planting. Short green sprouts developed which were not broken.

Lot one gave a total yield of 562 bushels and the sprouted potatoes 585. The sprouted tubers hastened the growth and produced potatoes ready for use ten days before those without sprouts.

DEPTH OF PLANTING.—Three rows of Early Ohio potatoes were planted at each of the following depths: two, four and six inches. The following table gives the yields together with a nine-year average: —

Depth of Planting	1925			Nine-year Average
	Large	Small	Total	
	Bu.	Bu.	Bu.	Bu.
Two inches	455	45	500	380
Four inches	461	28	489	407
Six inches	481	22	503	418

The results favour planting from four to six inches deep both from point of yield and percentage of marketable potatoes.

ENVIRONMENT TEST.—In 1924, half-bushel lots of Irish Cobbler were sent to Scott, Beaverlodge, Morden and Leacross. Seed grown from these potatoes was returned and grown at this Station in 1925. The potatoes from Beaverlodge

were delayed on the way and did not arrive until ten days after those from the other points had been planted. Seed grown at Morden yielded 646 bushels, at Rosthern 596 bushels, at Scott 568 bushels, at Beaverlodge 504 bushels and at Leacross 451 bushels.

Morden and Scott are south of Rosthern; whereas Leacross and Beaverlodge are north.

PEPPERS

Seed of five varieties was sown in flats and transferred to the hotbed on April 9. The seedlings were transplanted to the open on June 6 in rows two feet apart with the plants set two feet apart in the row.

Harris Earliest and Squash or Tomato varieties produced the heaviest yield of fruit. All fruits were green and immature.

RHUBARB

The abundant moisture in 1925 produced a heavy crop of rhubarb. From May 21 to September 9 a three-year plantation of the Victoria variety yielded at the rate of 15 tons 822 pounds per acre.

VARIETY TEST.—The yields in the table following were from plants which were developed from seed sown in 1922. The results as given are based upon the yields from $\frac{1}{240}$ acre plot:—

Variety	Source	Colour	Quality	Yield per acre	
				Tons	Pounds
Ruby	Ottawa	Red	Excellent	11	560
Stotts Monarch	Prince Albert	Green	Excellent	11	560
Victoria	Rosthern	Red and green	Good	9	1,440
Victoria	Lethbridge	Red and green	Good	8	560
Victoria	Prince Albert	Red and green	Good	8	640
Solid large Red No. 1	0-45	Red	Fair	4	1,720
Solid large Red No. 2	0-45	Red	Fair	4	1,360

SEEDLINGS.—Seed sown in 1923 developed stalks in 1925 of from 3 to 5 inches in circumference and from 15 to 20 inches in length. Seed sown in 1924 produced stalks 3 to 3½ inches in circumference and 15 to 18 inches in length.

RADISH

Seed of six summer-varieties was sown on May 6 and three winter-varieties on July 7. Of the summer varieties French Breakfast, Twenty-Day, Turnip Scarlet White Tipped and Scarlet Oval were ready for use on June 9 and gave a total yield throughout the season of 29, 29, 44 and 35 bunches respectively. White Icicle was ready for use on June 19 and yielded 19 bunches. White Strasburg did not do well this year. Twenty-Day, Scarlet Oval, French Breakfast and White Icicle are recommended for their quality.

When harvested on September 30 Long Black Spanish gave a yield of 18 pounds and Rose 32 pounds. These winter varieties were sown in 30-foot rows which were eighteen inches apart. The roots harvested were firm and clean.

SPINACH

Four varieties were tested and the seed was sown on May 6. King of Denmark, Viroflay and Victoria were ready for use on June 19. The season for the two latter varieties extended to July 6 whereas King of Denmark lasted a few days longer. New Zealand, a late variety, was ready for use on August 8.

SALSIFY

Seed of Long White French and Sandwich Island was sown on May 6, thinned on June 23 and yielded 36 and 23 pounds respectively when harvested on September 30.

SQUASH

Results with squash were similar to those of pumpkins. Plants started in the hotbed gave a greater yield than the same varieties sown in the open. English Vegetable Marrow, Green Hubbard, Golden Hubbard, Delicious and Kitchenette were the heaviest yielders.

SWISS CHARD

Silver Leaf, Lucullus and Fordhook Giant were grown and on September 30 the weight per six heads was 34, 32 and 40 pounds respectively.

TURNIPS

Five varieties of table-turnips and four varieties of swedes were grown and gave an average yield from a thirty-foot row of sixty-seven pounds from the table-varieties as compared with seventy-one pounds from the swedes. A fifteen-foot row of each of the table-varieties produced a total of 36 bunches which were used as new vegetables. Of the table-varieties Golden Ball, Early Snowball and Extra Early Purple Top Milan are good. Hall Westbury is one of the best swedes for table-use.

TOMATOES

Forty-five varieties or strains were tested. The seed was sown in fine soil in flats on April 2 and placed in the hotbed on April 9. The seedlings were pricked out on April 24 and transplanted to the open on May 28 in rows three feet apart and the plants three feet apart in the row. The season was favourable for the set of fruit and the yields were good.

VARIETY TEST.—In the test of varieties all plants were pruned to one stem. Five plants of each variety were tied upon stakes and an equal number were left unstaked. The results given below are the yields from five plants for each method and represent twenty-four of the highest-yielding varieties or strains:—

TOMATOES—VARIETY TEST

Variety	Source	Five Plants Staked				Five Plants Unstaked			
		Ripe		Green		Ripe		Green	
		lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Alacrity 0-6-6-1	0-5465	27	9	9	8	13	2	10	0
New Fifty Day	Buckbee	22	14	8	8	11	10	4	6
Sparks Earliana	McKenzie	19	15	15	3	2	13	11	4
Alacrity X Hipper 5-2-1	0-5458	18	7	13	0	13	9	10	4
Bolgiana	Bolgiana	16	9	9	10	5	12	5	12
IXL Extra Early	Rennie	14	10	17	1	13	2	8	8
Avon	Vaughan	14	5	4	4	8	8	1	9
Alacrity X Earlibell	0-5455	13	9	13	4	11	5	6	12
Self Pruning	Burpee	13	6	14	4	2	5	11	8
Pink	0-5463	12	5	11	0	5	0	4	0
Bonny Best	Stokes	12	5	19	2	7	2	11	12
Earliana Grade 2	Langdon	11	14	7	0	8	0	5	6
Alacrity	McKenzie	11	13	15	0	10	6	6	2
Bonny Best Standard Strain	Stokes	11	10	22	12	5	12	7	12
Alacrity 0-10-5-1	0-5468	11	9	16	0	6	11	10	3
First of All	McKenzie	11	2	17	2	10	3	5	12
Wayahead	Bruce	10	12	12	13	13	9	6	6
Burbank	Bruce	9	8	6	12	10	11	8	12
The Burbank	Burbank	8	5	17	1	14	6	7	12
Danish Export	Wibolt	8	2	12	0	10	0	5	10
Bruce First and Best	Bruce	6	9	21	11	8	10	13	9
North Dakota Earliana	Wedge	6	4	19	5	11	7	10	4
Matchless	Livingston	2	11	9	4	1	8	7	2
John Baer	Steele Briggs	1	0	13	8	8	10	5	2
Total		297	1	325	0	214	1	185	7
Total Fruit		622 lb. 1 oz.				399 lb. 8 oz.			

DIFFERENT METHODS OF PRUNING.—On May 29 three rows of each of three varieties were transplanted to the open in rows two feet apart and plants two feet apart in the row. As the fruit set, the plants in one row of each of the varieties were cut above the first bunch of fruit, and this method of pruning was compared with cutting above the second bunch and third bunch. The following table gives the yields of ripe and green fruits and the percentage of ripe fruit from each method. These results are the yields from 15 plants for each method:—

METHODS OF PRUNING

Varieties	One Bunch				Two Bunches				Three Bunches			
	Ripe		Green		Ripe		Green		Ripe		Green	
	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
Bonny Best	16	10	3	12	33	12	6	8	28	13	21	0
Danish Export	26	12	10	0	24	0	5	0	30	11	8	12
Earliana	32	1	4	0	47	3	6	8	46	14	10	8
Total	75	6	17	12	104	15	18	0	106	6	40	4
Percentage of ripe fruit	80·9		.....		85·3		.....		72·0		.....	

Two or three bunches of fruit give much the heavier yield and fruits are ready for use equally as early as the plants cut above the first bunch of fruit.

RIPENING GREEN TOMATOES INDOORS.—If green tomatoes are cleaned, wrapped in tissue paper and stored in boxes they colour and ripen in from ten to fourteen days. When stored in hay they require a longer period to ripen.

TREE FRUITS

The apple-trees wintered well in 1924-25 and all trees carried a heavy bloom in the spring. Much of the lateral wood was cut out in the early part of the spring in such a manner as to allow the sunshine to penetrate into the centre of the tree. The fruit matured earlier this year and thirty-six bushels of crab apples were harvested. This fruit makes excellent preserves.

SMALL FRUITS

RASPBERRIES

The yield of raspberries was poor as a result of all varieties being damaged by frost. This may have occurred in the early part of the winter when the temperature dropped to 40 degrees below, or in the spring when late frosts may have destroyed the buds as they were opening. Throughout the summer all varieties produced a strong growth of new canes. In the autumn the old and weak canes were cut out and the good ones bent over and covered with slough hay. 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

Varieties	Yield per acre 1925	Average yield per acre 1922-23-24-25
	S.B.B.	S.B.B.
Miller	720	3,560
Newman No. 23	.....	2,884
St. Regis	.....	2,647
Herbert	1,050	3,247
Sunbeam	2,100	3,283
King	98	2,245
Ohta	1,388	2,492
Latham (Minnesota No. 4)	.....	2,842

Herbert, Ohta and Newman No. 23 are recommended for their flavour.

CURRANTS

There was only a small set of currants in 1925. The white maggot has become quite troublesome and as a result of the injury wrought by it the yield of saleable fruit was small.

STRAWBERRIES

The strawberry plants came through the winter in excellent shape. The Dakota and Rosthern June Bearing varieties gave a fair yield of fruit, which was, however, of poor quality and of inferior flavour. This was, no doubt, due to the abnormal rainfall during the strawberry season.

TREES, SHRUBS AND FLOWERS

The ornamental grounds on this Station are both attractive and permanent. The design or plan is free from formal effects and can be applied with modifications to suit most prairie conditions. The well-kept lawn with some shrubs and flower borders always creates a favourable impression. Not only do they beautify, but the trees, shrubs and hedges, break the wind and pile up the snow which affords winter protection and adds additional moisture to the lawns and garden-plots.

The work in this branch consists mainly of variety tests and ultimate selections of hardy and suitable plants for home-beautification.

The caragana commenced to bloom on May 27 and its season was over on June 15.

The different species of lilacs bloomed for a period extending from May 8 until July 10. Of this group the first to bloom was the *Syringa vulgaris*, otherwise known as the common lilac and including both the purple and white varieties. *S. Josikaea* and *S. villosa* belong to the intermediate blooming season and their flowers are of reddish-violet colour. The last species to bloom is the *S. japonica*, which is characterized by large panicles of creamy-white flowers having a remarkably sweet fragrance.

Next to the lilacs the honeysuckle are, possibly the most popular ornamental shrubs. They are easy of propagation and quite hardy. *Lonicera Alberti* is a procumbent species and is very suitable for rockeries. Its flowers are rosy-pink and very fragrant, and the season lasts about ten days around the middle of June. *Lonicera tatarica grandiflora* and *L. tatarica alba* are representatives of the bush honeysuckle and are desirable for shrubberies. These have pink and white flowers respectively and bloom about the middle of June.

Other trees and shrubs worthy of a place in any shrubbery are: Tartarian maple *(Acer tataricum)*, white spruce *(Picea canadensis)*, laurel-leaved willow *(Salix pentandra)*, sharp-leaved cotoneaster *(Cotoneaster acutifolia)* sorbus-leaved spiraea *(Spiraea sorbifolia)*.

Elm trees set out on the lawn in 1924 have become well established.

Some of the hedges being tested at Rosthern.

FLOWERS AND LAWN

Bulbs that were planted out the last of October 1923 made a splendid display in the spring of 1924 and 1925. A list of bulbs recommended may be seen in the 1924 report of Rosthern Station.

The annual borders made a gorgeous showing from the last of June until the latter part of September. Varieties sown in the open did almost as well as the same varieties sown in the hotbed.

The perennial border gave a continual bloom from the first week of June until fall.

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

CEREALS

This season of 1925 was nearly ideal for all cereal crops and yields in most cases were above average. An abundance of moisture was available for the plants during the growing season with the exception of about two weeks in the latter part of July and the first of August when a hot dry period affected grain in the later stages of development. The effect of this period was most noticeable on barley and early maturing oat and wheat varieties.

It was very noticeable that yields of grain on stubble equalled and in a few cases surpassed the yields on summer-fallow. This appears to have been due to the abundant moisture and the very light crop which was harvested in 1924. These two circumstances would tend to make well-prepared second-crop stubble-land nearly equivalent to summer-fallow.

Some of the cereals were badly damaged by cutworms during May and early June. Due to a warm period of weather early in the spring the eggs of the

cutworm moth hatched early and the worms began their ravages while the plants were very young. Flax suffered most from this attack.

Rust was present on the later varieties of wheat, oats and barley but no damage was noticed due to the lateness of the attack. The fungi did not develop beyond the early red rust stage excepting in a few cases.

WHEAT

Sixteen varieties or strains of wheat were tested on $\frac{1}{40}$-acre uniform plots after summer-fallow.

Supreme, one of Doctor Seager Wheeler's selections gave the highest yield but was closely followed by two strains of Marquis.

An abbreviated table is shown of nine of the highest yielders. This gives the average time of maturity and average yield for four years as well as the yield for each year in the average.

The results on the second table, being an average of four years, are fairly conclusive. By it we see that Marquis has yielded the highest. The difference is very small between the first five, however, and we could expect any one of them to lead the list in a season which favoured it.

WHEAT TEST OF VARIETIES OR STRAINS ON SUMMER-FALLOW
Sown April 20

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre	
			inches	bush.	lb.
Supreme	Aug. 17	120	39	37	20
Marquis—Ottawa 15	" 19	122	41	36	40
Marquis—Sanderson	" 20	123	40	35	..
Red Fife—Ottawa 17	" 24	127	41	33	20
Golden	" 19	122	41	32	40
Orchard's selection	" 21	124	41	31	40
Early Triumph	" 18	121	39	31	20
Kitchener	" 24	127	43	31	..
Early Red Fife	" 22	125	41	28	40
Garnet—Ottawa 652	" 13	116	37	28	20
Ceres—(1658)	" 16	119	39	28	00
Brownie—Ottawa 491	" 15	118	40	27	40
Producer—Ottawa 197	" 14	117	36	27	40
Ruby—Ottawa 623	" 14	117	39	26	20
Kota	" 16	119	41	25	40
Reward—Ottawa 928	" 14	117	39	24	..

WHEAT—AVERAGE AND ANNUAL YIELDS ON SUMMER-FALLOW

Name of variety	Number of days maturing	Yield per acre									
		1925		1924		1923		1922		Average	
		bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Marquis—Ottawa 15	121	36	40	17	40	36	57	43	20	33	39
Kitchener	124	31	..	19	..	36	40	42	40	32	20
Supreme	119	37	20	17	..	37	00	35	20	31	40
Garnet-Ottawa 625	112	28	20	18	20	44	..	35	40	31	35
Red Fife Ottawa 17	124	33	20	17	20	35	12	39	..	31	13
Early Triumph	117	31	20	14	20	38	40	33	20	29	25
Kota	119	25	40	17	40	32	40	33	20	27	20
Ruby—Ottawa 625	112	26	20	15	..	30	40	27	40	24	55
Reward—Ottawa 928	113	24	..	12	40	24	30	29	20	22	37

WHEAT ON WHEAT STUBBLE

Six of the leading varieties of wheat were tested on fall-ploughed wheat stubble. In this test Garnet yielded highest surpassing its yield on summer-fallow, and while only one of the others, Supreme, did this they all showed a very small spread in yield between summer-fallow and second-crop land.

WHEAT TEST OF VARIETIES OR STRAINS ON STUBBLE—SOWN APRIL 22

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre
				bush. lb.
Garnet—Ottawa 652	Aug. 11	112	38	35 ..
Supreme	" 19	120	38	34 40
Marquis—Ottawa 15	" 19	120	39	31 20
Kitchener	" 24	125	42	29 20
Red Fife—Ottawa 17	" 22	123	41	27 ..
Kota	" 12	113	41	25 20

Much interest has been expressed of late in the new Garnet wheat (Ottawa 652). A six-year average at this Station shows that the average time required for Garnet to mature is 105 days, whereas Marquis requires 115. In yield Marquis has out-yielded Garnet by less than one bushel per acre which is not a significant difference. Where an earlier variety than Marquis is required, Garnet will provide an excellent substitute for Ruby which heretofore has been recommended as an early sort. Ruby and Garnet require practically the same length of time to mature.

OATS

Of the ten varieties and strains of oats tested in 1925, Banner Ottawa 49 gave the highest yield. This variety stands high in the five-year average although exceeded slightly by Victory. Gold Rain and Leader are a little earlier than the other two and almost as high in yield in a five-year average. Liberty and Laurel are hulless and their yield per acre is hardly comparable therefore with the hulled varieties, unless this characteristic is taken into consideration. The hulled varieties have an important place in the feeding of chickens and young pigs.

OATS TEST OF VARIETIES OR STRAINS ON SUMMER-FALLOW—SOWN MAY 1

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre
			inches	bush. lb.
Banner—Ottawa 49	Aug. 15	107	43	78 08
Leader	" 13	105	42	75 30
Banner—Cay	" 15	107	42	74 04
Victory	" 12	104	41	72 12
Longfellow—Ottawa 478	" 12	104	40	67 02
Gold Rain	" 13	105	40	66 16
Gerlach	" 15	107	40	66 06
Laurel—Ottawa 477	" 11	103	34	48 28
Liberty—Ottawa 480	" 9	101	38	45 30
Alaska	" 5	97	37	45 10

OATS AVERAGE AND ANNUAL YIELDS

Name of variety	Average number of days maturing	Yield per acre					
		1925	1924	1923	1922	1921	Average
		bush. lb.	bush. lb.	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Victory	107	72 12	17 22	72 32	80 ..	84 24	65 18
Banner—Ottawa 49	107	78 08	17 22	67 02	69 14	83 18	63 06
Gold Rain	106	66 16	25 10	76 15	77 22	58 28	60 32
Leader	106	75 30	18 08	72 02	65 30	70 20	60 18
Longfellow	104	67 02	16 16	57 22	76 16	63 13	56 07
Alaska	96	45 10	17 02	69 24	53 18	41 26	45 16
Liberty	102	45 30	12 12	54 04	41 26	49 14	40 24

OATS ON OAT STUBBLE

The same varieties of oats which were under test on summer-fallow were sown on stubble. The yields as in wheat were very high as compared with the same varieties on summer-fallow and in the case of Alaska the returns on stubble were higher.

OATS TEST OF VARIETIES OR STRAINS ON STUBBLE—SOWN MAY 2

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Yield grain per acre
			inches	bush. lb.
Banner—Ottawa 49	Aug. 13	104	39	67 22
Gerlach	" 13	104	34	62 32
Banner-Cay	" 11	102	34	61 26
Gold Rain	" 12	103	35	60 20
Longfellow—Ottawa 478	" 11	102	35	59 14
Victory	" 12	103	36	57 22
Leader	" 10	101	35	52 32
Alaska	" 3	94	34	49 14
Laurel—Ottawa 477	" 12	103	32	44 24
Liberty—Ottawa 480	" 10	101	33	42 32

BARLEY

Nine varieties of barley were under comparative test on summer-fallow. Of these, Chinese made the highest yield but was followed very closely by Bearer and O.A.C. 21. In a five-year average, Chinese and O.A.C. 21 also yield high. Bearer has only been under test for two years at this Station and very little can be said of it yet. Himalayan, a black hulless variety, yielded very well and has produced a high average as well, when compared with hulled varieties. It also matures earlier than any of the other high-yielding varieties, which should make it valuable as a cleaning crop.

TEST OF VARIETIES OR STRAINS OF BARLEY ON SUMMER-FALLOW—SOWN MAY 11

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre
			inches	bush. lb.
Chinese—Ottawa 60	Aug. 11	93	45	52 24
Bearer—Ottawa 475	" 14	96	37	52 04
O.A.C. 21	" 11	93	43	47 44
Duckbill—Ottawa 57	" 21	103	37	43 16
Himalayan—Ottawa 59	" 2	84	32	40 ..
Junior—Ottawa 471	" 3	85	30	38 36
Feeder—Ottawa 561	" 6	88	40	32 04
Success	" 1	83	35	27 44
Albert—Ottawa 54	" 1	83	35	20 ..

BARLEY, AVERAGE AND ANNUAL YIELDS

Name of variety	Average number of days maturing	Yield per acre					
		1925	1924	1923	1922	1921	Average
		bush. lb.	bush. lb.	bush. lb.	bush. lb.	bush. lb.	bush. lb.
O.A.C. 21	96	47 44	12 24	52 01	60 20	37 04	41 47
Chinese	97	52 24	10 ..	52 20	45 ..	46 12	41 11
Himalayan (hulless)	88	40 ..	15 ..	39 28	45 40	40 20	36 08
Duckbill (2-row)	106	43 16	16 32	35 40	30 40	35 20	32 30
Junior (hulless)	90	38 36	6 22	35 20	42 24	32 44	31 10
Success	88	27 44	12 44	44 28	22 24	27 24	27 04
Albert	86	20 ..	7 04	28 26	27 44	27 44	22 14

BARLEY ON BARLEY STUBBLE

The varieties tested on summer-fallow were also compared on barley stubble and in several cases showed surprising results. Himalayan yielded about five bushels more following stubble than on summer-fallow and two others showed an increased yield. Results like these happen but seldom.

BARLEY—TEST OF VARIETIES OR STRAINS ON STUBBLE—SOWN MAY 11

Name of variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre
			inches	bush. lb.
Himalayan—Ottawa 59	Aug. 5	87	31	45 40
Chinese—Ottawa 60	" 7	89	40	37 24
O.A.C. 21	" 10	92	38	36 32
Bearer—Ottawa 475	" 13	95	36	35 20
Albert—Ottawa 54	" 1	83	35	29 28
Junior—Ottawa 471	" 3	85	30	29 28
Success	" 3	85	36	29 08
Duckbill—Ottawa 57	" 19	101	31	26 12
Feeder—Ottawa 561	" 6	88	41	25 20

FIELD PEAS

Seven varieties of field peas were compared under uniform conditions. The highest returns were produced by Arthur for this season, but in a five-year average, Champlain has surpassed it by nearly a bushel. Golden Vine Sask. 625 was compared for the first time but was surpassed in yield by Chancellor, a variety which is very similar.

When grown for forage, some of the low-yielders in grain gave the highest yields in hay. Of the varieties tested for hay this year, Chancellor gave the greatest tonnage.

FIELD PEAS, TEST OF VARIETIES AND STRAINS
Sown May 6

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre
			inches	bush. lb.
Arthur—Ottawa 18	Aug. 18....	105	38	41 02
Champlain—Ottawa 32	" 17....	104	47	37 57
Early Feed—Ottawa 30	" 13....	100	50	37 52
Mackay—Ottawa 25	" 19....	106	62	37 06
Cartier—Ottawa 19	" 17....	104	40	35 24
Chancellor—Ottawa 26	" 14....	101	63	33 22
Golden Vine—Sask. 625	" 15....	102	49	31 25

FIELD PEAS, AVERAGE AND ANNUAL YIELDS

Name of Variety	Average number of days maturing	Yield per acre										Average	
		1925		1924		1923		1922		1921			
		bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.	bush.	lb.
Champlain	109	35	57	11	40	25	40	46	40	36	..	31	11
Arthur	110	41	02	11	..	19	20	45	20	35	20	30	12
Early Feed	106	37	52	9	..	24	20	43	20	30	..	28	54
Chancellor	104	33	22	9	10	26	..	40	..	26	40	27	02

FIELD BEANS

Five varieties of field beans were grown. Four of them matured very well and produced a good quality and quantity of beans. Navy is late in maturing and only about fifty per cent were ripe when harvested. Norwegian was the earliest and highest yielder and though brown in colour makes an excellent baking-bean for table use. Large White and Beauty are fairly early and are both white in colour though Beauty shows a brownish spot at the hilum (eye). Chinese is a blue-and-white bean and resembles the ordinary garden string-bean. Navy is all white.

FIELD BEANS—TEST OF VARIETIES OR STRAINS

Sown May 20

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Yield of grain per acre	
			inches	bush.	lb.
Norwegian—Ottawa 710	Sept. 5	109	13	74	41
Large White—Ottawa 713	" 6	110	12	50	12
Beauty—Ottawa 712	" 5	109	10	49	38
Chinese	" 9	113	11	32	30
Navy—Ottawa 711	.....	.....	18	23	24

FLAX

The results from three varieties of flax are shown in the following table but due to severe cutworm damage, the yields are not very reliable. A two-year average bears out the same results however in that Crown yields higher than the other two varieties.

FLAX, TEST OF VARIETIES OR STRAINS

Sown May 9

Name of Variety	Date of ripening	Number of days maturing	Average length of straw	Yield per Acre			
				1925		2-year average	
			inches	bush.	lb.	bush.	lb.
Crown	Sept. 5	120	22	14	36	12	08
Novelty	Aug. 28	114	24	12	28	10	..
Premost	" 31	115	22	12	28	9	36

FORAGE PLANTS

Weather conditions this season were nearly ideal for all forage plants and in most cases good yields were harvested. Due to severe weather in the winter of 1924 and 1925, however, the stand of perennial and biennial plants was considerably lowered.

Winter-killing was most noticeable in biennial sweet clover although more than usual loss occurred in other plants of a more hardy nature.

Cutworms also lowered the stand and in some cases destroyed altogether experiments with certain plants. Cutworm damage was most severe among mangels and sweet clover although no plants appeared to be totally immune to their attacks.

ANNUAL HAY CROP

SWEET CLOVER FOR ANNUAL HAY

Three varieties of sweet clover, namely, Hubam, white-blossom sweet clover and yellow-blossom sweet clover were sown under like conditions in 1925, and duplicate plots of each variety were sown broadcast with the ordinary drill at 6 and 24 inches distance. Further plots at the 24-inch distance were sown with a mixture of the legume and oats.

Early in the season the young legume plants were severely attacked by cutworms. Hubam suffered least, and the 24-inch rows of white sweet clover and yellow sweet clover most. Once the cutworms had passed the larval stage, however, all varieties made a remarkable recovery and produced fair average crops.

Hubam is an annual. The stand was strong, erect and vigorous, and all the Hubam yields were high. White-blossom sweet clover stood up fairly erectly and made a fairly strong growth. At cutting it averaged slightly over two feet in height and was easily handled with the grain binder. Yellow-blossom sweet clover was distinctly decumbent. The general tendency of the plants was to spread out their branches over the surface of the ground. On this account the plots were extremely difficult to cut with the binder, and this in part will account for the low yields of yellow-blossom sweet clover as compared with the white-blossom variety.

One plot of Zouave sweet clover was planted to compare it with ordinary yellow-blossom in regard to habit of growth. Zouave sweet clover is an erect-growing sweet clover with little apparent tendency to lie down, apparently rather finer in stem and leaf than white-blossom. No hay has yet been cut.

SWEET CLOVER FOR ANNUAL HAY

Method of Sowing	Hubam		White Sweet Clover		Yellow Sweet Clover	
	Green Weight	Oven-dry Weight	Green Weight	Oven-dry Weight	Green Weight	Oven-dry Weight
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Broadcast	9 140	2 624	5 1,060	1 416	3 780	.. 1,257
6-inch drills	9 260	2 655	6 1,320	1 849	4 1,180	1 143
24-inch drills	11 90	2 470	4 380	.. 1,939	1 1,964	.. 986

SWEET CLOVER FOR ANNUAL HAY

Method of Sowing	Hubam		White Sweet Clover		Yellow Sweet Clover	
	Green Weight	Oven-dry Weight	Green Weight	Oven-dry Weight	Green Weight	Oven-dry Weight
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
24-inch drills	5 1,540	1 851	4 1,020	1 87	4 1,040	1 135

For annual hay Hubam appears to outyield the other varieties sufficiently to justify its use as an annual hay crop. There its usefulness ends, however, whereas the white and yellow-blossom sweet clovers yield a large return the following year. In addition it may be stated that at this Station Hubam has never matured and it is necessary to import the seed every year. All things considered it is doubtful if the general adoption of Hubam into farming here is advisable.

TEFF GRASS

This annual grass is an introduction from South Africa. It has been grown on the Station here for two years, 1923 and 1925. Unfortunately seed was not available to sow in 1924. It is claimed that this grass has a high protein content for a grass, and that it is drought-resistant. The grass somewhat resembles red top in appearance, and this year attained a height of about 28 to 30 inches by the middle of September. In 1923 it yielded an oven-dried weight of 3 tons 304 pounds per acre. This year, the yield was approximately 1 ton 1,850 pounds per acre. This yield stands up well in comparison with the yields here this year for western rye grass and brome grass.

VARIETIES OF OATS FOR ANNUAL HAY

Six varieties of oats were sown for hay in a variety test. Three plots of each variety were sown. One plot of each variety was cut immediately when the plants were headed; the second plot two weeks after heading; and the third plot just as the colour turned to yellow. All cuttings made excellent feed, but the cuttings at turning in each case made better hay on account of the well-filled grain and the more fully matured yet succulent straw.

OAT VARIETIES FOR ANNUAL HAY

Variety	Air-Dry Weights			Average Yield			Average
	Cut when heading	Cut two weeks later	Cut when turning	Green weight	Air-dry weight	Oven-dry weight	For three years, oven-dry
	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.	tons lb.
Victory	1 1,753	2 1,582	4 337	7 990	2 1,891	2 909	2 821
Banner	1 1,894	3 275	3 846	8 680	2 1,672	2 726	2 697
Gold Rain	1 429	3 40	4 126	7 300	2 1,532	2 398	2 690
Longfellow	1 1,747	2 1,557	4 100	7 1,470	2 1,801	2 835	2 268
Gerlach	1 1,493	2 1,546	3 1,367	7 550	2 1,469	2 557	... ...
Liberty	1 1,023	2 1,168	3 739	7 1,170	2 977	2 147	... ...

From the three-year average it would appear the best yields of hay are obtained from those varieties which give the highest yields of grain; Victory, Banner and Gold Rain.

DATES OF SOWING OATS AND BARLEY FOR ANNUAL HAY

In order to determine the best time for sowing oats and barley for hay, duplicate plots of Victory and Banner oats and Feeder barley were sown at weekly intervals commencing on May 4 and continuing until June 29. An adequate supply of moisture was available throughout most of the growing season.

Feeder barley was used in this experiment on account of its lack of awns, its length of succulent straw, and its well-filled kernel while still green in the straw which makes it an excellent barley for hay. All sowings were cut at the same stage of maturity, when turning.

DATES OF SOWING VICTORY OATS FOR ANNUAL HAY

Date of Sowing	Yield per Acre		
	Green Weight	Air-dry wright	Oven-dry weight
	tons lb.	tons lb.	tons lb.
Sown May 4	7 320	3 721	3 01
Sown one week later	7 500	2 1,407	2 828
Sown two weeks later	7 1,700	2 1,697	2 1,087
Sown three weeks later	8 60	2 1,655	2 1,049
Sown four weeks later	7 1,840	2 1,803	2 1,181
Sown five weeks later	8 1,200	2 916	2 389
Sown six weeks later	(Not cut	as badly	rusted.)

DATES OF SOWING BANNER OATS FOR ANNUAL HAY

Date of Sowing	Yield per Acre		
	Green weight	Air-dry weight	Oven-dry weight
	tons lb.	tons lb.	tons lb.
Sown May 4	6 1,540	3 1,231	3 456
Sown one week later	8 1,440	3 1,115	3 353
Sown two weeks later	8 1,160	3 1,168	3 400
Sown three weeks later	7 1,640	3 90	2 1,438
Sown four weeks later	7 1,280	3 835	3 103
Sown five weeks later	10 25	2 1,779	2 1,160
Sown six weeks later	(Not cut	as badly	rusted.)

DATES OF SOWING FEEDER BARLEY FOR ANNUAL HAY

Date of Sowing	Yield per acre		
	Green weight	Air-dry weight	Oven-dry weight
	tons lb.	tons lb.	tons lb.
Sown May 4	7 1,100	2 136	1 1,693
Sown one week later	7 950	2 1,193	2 637
Sown two weeks later	6 1,400	2 1,805	2 1,182
Sown three weeks later	6 1,120	2 1,898	2 1,266
Sown four weeks later	6 1,600	2 1,301	2 733
Sown five weeks later	7 500	2 1,360	2 786
Sown six weeks later	6 1,200	2 1,370	2 795
Sown seven weeks later	6 1,360	2 1,323	2 761

This year Victory oats gave a uniformly higher yield of hay for each date of sowing than did Banner. It is also noteworthy that although rust did not appear until comparatively late in the season, both varieties of oats and also Feeder barley sown later than the fifteenth of June were too badly attacked by rust to be worth cutting for a hay crop.

BARLEY VARIETIES AS ANNUAL HAY

Eight varieties of barley were compared on uniform plots for annual hay. They were cut at similar stages to those in the oat variety test for hay and yielded as in the following table. Some of the varieties included in the test are not well suited for hay but were sown so as to make a complete representation of all types.

BARLEY VARIETIES FOR ANNUAL HAY

Variety	Air-Dry Weights						Average Yield					
	Cut when heading		Cut two weeks later		Cut when turning		Green weight		Air-dry weight		Oven-dry weight	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Duckbill	2	637	2	796	2	1,930	7	1,350	2	1,121	2	753
O.A.C. 21	1	901	2	1, 84	2	1,824	6	1,940	2	703	2	199
Feeder	1	925	2	1,122	2	923	7	950	2	323	1	1,844
Mensury	1	1,190	2	1,374	2	264	6	1,910	2	276	1	1,825
Himalayan	1	340	2	818	2	1,078	6	1,460	2	75	1	1,642
Chinese	1	954	2	995	2	593	6	1,630	2	61	1	1,626
Junior	1	373	2	829	1	1,758	5	540	1	1,653	1	1,285
Success	..	1,339	1	1,936	1	1,895	4	1,120	1	1,057	1	729

All these varieties with the exception of Feeder and Success have strong rough awns which harden to a considerable extent even when cut at an early stage and are therefore undesirable as feed.

Feeder is a beardless or hooded barley without this unpleasant feature. Its straw stays green until the grain is fairly well matured, so that this variety makes an excellent hay, having a succulent straw, a high percentage of grain in the sheaves and is awnless.

PEA VARIETIES FOR ANNUAL HAY

The season was particularly favourable for peas. When cut on August 18 the vines were overripe and the seed was beginning to toughen. For the best hay, peas should be cut about the time the pods are filled but still green. Following are the comparative yields of pea hay.

PEA VARIETIES FOR ANNUAL HAY

Variety	Yield per Acre							
	Green weight		Air-dry weight		Oven-dry weight		Two-year average oven-dry weight	
	tons	lb.	tons	lb.	tons	lb.	tons	lb.
Chancellor	4	560	2	1,870	2	1,241	1	1,454
Early Feed	3	1,200	2	1,764	2	1,146	1	1,349
Champlain	3	1,160	2	1,262	2	698	1	1,223
Arthur	3	882	2	770	2	259	1	1,006

MIXTURES OF PEAS AND OATS FOR ANNUAL HAY

Various mixtures of peas and oats were sown on duplicate plots. Different varieties of peas were used and one duplicate plot was sown to peas one week before planting the oats.

MIXTURES OF PEAS AND OATS FOR ANNUAL HAY

Sown April 30

Mixture or Proportion by Weight	Yield per Acre					
	Green weight		Air-dried weight		Oven-dried weight	
	tons	lb.	tons	lb.	tons	lb.
Arthur peas alone	3	1,790	3	264	2	1,593
" peas 7, oats 3	4	1,000	2	1,089	2	544
" peas 5, oats 5	5	200	3	247	2	1,578
" peas 3, oats 7	5	160	3	300	2	1,625
" peas 5, oats 5, sown one week before oats	4	640	2	1,330	2	759
Oats alone	4	1,040	3	754	3	30
Chancellor peas alone	4	300	2	1,724	2	1,111
" peas 7, oats 3	5	20	2	1,314	2	745
" peas 5, oats 5	4	920	2	264	1	1,807
" peas 3, oats 7	4	1,880	1	1,762	1	1,359
Oats alone	4	1,040	3	754	3	30

In no case did the yield from a pea and oat mixture or from peas alone exceed the yield of oats alone. Only Arthur peas at the rate of 3-7 exceeded in yield of oven-dry matter the yield of pea varieties sown alone. The yield of peas in the mixture was very small probably on account of the rank growth made by the oats which cut off the light from the more decumbent peas.

No apparent gain in tonnage was obtained by sowing the peas before the oats but there was a higher percentage of pea straw than in the same mixtures sown together.

SEEDING GRASSES AND LEGUMES FOR HAY AND SEED

The dry season of 1924 seriously interfered with grass experiments on this Station this summer. Several experimental tests were unproductive of results from partial or total failure of seed germination in the summer of 1924. The severe winter also exacted a toll, and considerable winter-killing occurred especially on knolls where the wind had swept the land bare of snow. While rye grass stands were by no means perfect or free from winter-killing, rye grass appeared to suffer less than did brome. The dry-matter content of western rye grass was also considerably higher than of brome and the yields, where comparable, much greater.

SWEET CLOVER FOR HAY

Experiments with sweet clover suffered considerably from the attack of cutworms. With the exception of the flax crop, sweet clover suffered the most severely from cutworm damage. On certain plots the young shoots were eaten off before they could emerge, and little growth was visible till the larval stage of the insect had passed, about the end of June. Thereafter, young shoots appeared and by the middle of September a certain amount of growth was made but was not cut for hay. In the case of sweet clover, the damage was least severe this year on the plots which were sown with a nurse-crop.

METHODS OF SOWING SWEET CLOVER FOR HAY AND SEED—WITH A NURSE-CROP

Method of Sowing	Green weight	Air-dried weight	Oven-dried weight	Height	For seed
	tons lb.	tons lb.	tons lb.	inches	tons lb.
Broadcast	8 1,773	2 731	2 222	51	1 ....
6-inch drills	11 470	2 1,549	2 806	54	.. 1,777
24-inch drills	8 957	3 1,931	1 1,429	60	.. 666
30-inch drills	5 1,088	1 714	1 349	44	.. 1,920
36-inch drills	6 620	1 1,048	1 630	52	1 660

METHODS OF SOWING WESTERN RYE GRASS ALONE AND WITH A NURSE-CROP FOR SEED

Experiments were conducted in the methods of sowing western rye grass to obtain information regarding the yields of seed obtainable from this grass when sown in various ways in 1924. Plots were sown broadcast in 6-inch drills, 24, 30 and 36-inch drills. Similar plots were sown and covered with a nurse-crop of oats. All plots were harvested during the latter half of July and threshed for seed.

Method	Yield in Pounds, 1925		Average Yield in Pounds for Two Years	
	Alone	With a nurse-crop	Alone	With a nurse-crop
Broadcast	605	480	322	245
6-inch drills	444	500	397	255
24-inch drills	920	281	710	140
30-inch drills	421	533	477	275
36-inch drills	227	250	267	130

WESTERN RYE GRASS—METHODS OF SOWING ALONE FOR HAY

Plots similar to the foregoing were sown in order to determine the yields obtainable from various methods of sowing. The broadcast and drilled plots had seed applied at the rate of 20 pounds per acre, and for 36-inch rows, 3.3 pounds. It will be observed that a considerable saving of seed is effected by the latter method.

METHODS OF SOWING WESTERN RYE GRASS ALONE FOR HAY

Method of Sowing	Yield per Acre			Height when cut
	Green weight	Air-dry weight	Oven-dry weight	
	tons lb.	tons lb.	tons lb.	inch
Broadcast	4 104	2 77	1 1,640	26
6-inch drills	5 1,245	2 433	1 1,958	28
24-inch drills	5 600	3 47	2 1,399	28
30-inch drills	4 389	2 656	2 157	29
36-inch drills	3 140	1 1,628	1 1,239	29

METHODS OF SOWING BROME FOR HAY

Duplicate plots of brome grass were sown at the rate, on the drill, of 20 pounds of seed per acre, broadcast in 6-inch drills and in rows 24, 30 and 36 inches apart. The whole experiment was duplicated and this time a nurse-crop was sown on the plots.

BROME FOR HAY WITH A NURSE-CROP

Method of Sowing	Yield per Acre			Height when cut
	Green weight	Air-dry weight	Oven-dry weight	
	tons lb.	tons lb.	tons lb.	inch
Broadcast	3 320	1 513	1 244	36
6-inch drills	3 400	1 355	1 103	30
24-inch drills	2 927	.. 1,596	.. 1,425	30
30-inch drills	2 243	.. 1,409	.. 1,258	33
36-inch drills	2 37	.. 1,210	.. 1,081	28

BROME FOR HAY WITHOUT A NURSE-CROP

Method of Sowing	Yield per Acre			Height when cut
	Green weight	Air-dry weight	Oven-dry weight	
	tons lb.	tons lb.	tons lb.	inch
Broadcast	Destroyed	.....	.....	.....
6-inch drills	4 660	2 226	1 1,774	33
24-inch drills	3 825	1 830	1 527	32
30-inch drills	2 1,400	1 229	.. 1,990	34
36-inch drills	2 445	.. 1,684	.. 1,504	36

ENSILAGE CROPS

SUNFLOWERS FOR ENSILAGE

Eighteen varieties or strains of sunflowers were sown in comparative test this season. The highest yields were obtained from Giant Russian types which are single-stalked, late-maturing varieties which seldom ripen seed in this latitude. Under average field conditions they will produce a large yield of forage which appears to make as palatable a silage as the finer-growing types. The yields and other information as well as a three-year average dry-matter yield of the ten leading strains are shown in the following table.

SUNFLOWER VARIETIES

Name of Variety	Sown May 5			Height	Three-year average yield oven-dry
	Source of seed	Yield per Acre			
		Green weight	Oven-dry weight		
		tons lb.	tons lb.	inches	tons lb.
Giant Russian	A. E. McKenzie, Brandon	16 637	2 1,163	88	2 1,114
Mammoth Russian	McDonald	12 1,905	1 1,668	86	2 729
Russian Giant	Disco	12 1,675	1 1,158	53	2 530
Manchurian	A. E. McKenzie, Brandon	12 930	1 1,066	63	1 1,517
Manteca	C.P.R.	15 560	1 1,832	62	1 1,367
Black	C.P.R.	13 1,970	1 1,670	56	1 1,354
Mixed	C.P.R.	13 1,855	1 1,426	61	1 1,104
Mixed	Locally grown	14 430	2 330	51	1 896
Ottawa 76	Ottawa	11 1,725	1 1,035	50	1 626
Mammoth Russian	C.P.R.	11 910	1 1,311	55	1 500

CORN VARIETIES

Name of Variety	Planted May 20				
	Source of seed	Height	Maturity at harvest	Yield per Acre	
				Green weight	Oven-dry weight
		inches		tons lb.	tons lb.
Burr Leaming	G. I. Carter	87	Tasseled	22 200	2 1,180
North Dakota	Steele Briggs	78	Silking	21 1,597	2 682
Golden Glow	J. O. Duke	87	Ears formed	21 280	1 1,906
North Western Dent Nebraska Grown	McKenzie Seed Company	77	Silking	19 1,800	2 978
Longfellow	J. O. Duke	83	Ears formed	18 1,910	2 442
Leaming	John Parks	85	Silking	18 1,590	2 624
North Western Dent	Dakota Improved Seed Co.	76	Milk	17 660	2 795
Longfellow	Dakota Improved Seed Co.	75	Ears emerg.	17 320	2 22
Compton's Early	J. O. Duke	84	Silked	16 1,920	1 1,711
Gehu North Western Grown	McKenzie Seed Company	59	Milk	16 1,705	2 870
Quebec 28	J. L. Todd	71	Early milk	16 932	2 468
Wisconsin No. 7	John Parks	85	Silking	16 905	2 370
Amber Flint	A. J. Wimple	67	Early milk	16 210	1 1,585
Yellow Dent	A. J. Wimple	82	Silking	15 1,020	1 1,545
Wisconsin No. 7	J. O. Duke	88	Silked	15 680	2 74
North Western Red Dent	McKenzie Seed Company	77	Silked	15 515	2 128
North Western Dent Dakota Grown	McKenzie Seed Company	66	Milk	15 342	2 90
Barley	J. O. Duke	85	Silked	15 335	1 1,910
North Western Red Dent	Brandon Exper. Farm	69	Early milk	15 185	2 391
Leaming	J. O. Duke	85	Silked	14 1,917	1 1,680
90 Day White Dent	Dakota Improved Seed Co.	76	Silking	14 1,630	1 1,588
White Cap Yellow Dent	Steele Briggs	85	Silked	14 1,460	1 1,768

CORN FOR ENSILAGE

This year twenty-two varieties of corn were tested. The season was very favourable from the point of view of moisture, although the summer was on the whole only moderately warm. The yields were well above the average for the past three years. No damaging frost was experienced until the thirteenth of September by which time all varieties were cut. Usually the first frost can be expected about the fifth of September and corn should be cut before that date. No grain ripened sufficiently for seed but in every case the yields of fodder were satisfactory.

North Western Dent from the Dakota Improved Seed Co., and Gehu furnished by the McKenzie Seed Company most nearly approached maturity, and with relatively high yields of dry matter gave the best yield of food value. These two varieties can be safely recommended to the farmer.

ROOTS

Roots on the experimental plots were subjected this year to a severe attack by cutworms and later by the red-and-black-striped beetle. Five types of roots were grown, swede turnips, fall turnips, carrots, sugar beets and mangels. The two former apparently escaped the ravages of both insects. Carrots and sugar beets were more severely attacked and had to be reseeded about the middle of June. Mangels were sown twice. On each occasion, the young plants emerged, but were entirely destroyed within a few days after emergence.

The yields from swedes and fall turnips were good. Stands were in most cases perfect and yields high. Carrots and sugar beets had a very short growing season but in spite of this did fairly well. Mangels were a complete failure.

Swedes and fall turnips are much more easily harvested than are carrots and sugar beets. Generally speaking, the yield from swedes was higher than was the yield from fall turnips and in addition swedes keep better in storage than fall turnips which rot so rapidly that they must be used in the early fall. Both of these plants have a strong flavour which may taint the milk if the roots or tops be fed to cows just before milking. If, however, milking is done before these are fed, a considerable amount of cut swede or fall turnip may be advantageously fed with the ration.

Sugar beets contain twice the dry matter of fall turnips and swedes and lack the undersirable flavour, but the tap-root, running deeply into the ground, make their harvesting exceedingly difficult. Carrots usually have the same deep-rooting habit and a slight flavour. As a conditioner for horses carrots are excellent and are eagerly eaten.

SWEDES

Thirty-six varieties or strains of swedes were under test on 66-foot quadruplicate rows. All were sown on May 19, thinned to 12 inches between plants and 30 inches between rows and pulled October 5.

The following table gives the results for the six highest yielders in dry matter for three years.

SWEDE VARIETIES

Name of Variety	Source of Seed	Yield per Acre				3-year average	
		Green weight		Oven-dry weight		Oven-dry weight	
		tons	lb.	tons	lb.	tons	lb.
Bangholm	McKenzie Seed Co	31	1,260	4	338	3	500
Breadstone	McKenzie Seed Co	27	420	3	482	3	464
White Swede	Bruce	32	70	4	439	3	254
Bangholm	Ewing	27	1,390	3	812	2	1,901
Ditmars	McNutt	28	1,720	3	315	2	1,854
Selected Westbury	Steele Briggs	33	1,240	3	697	2	1,823

FALL TURNIP VARIETIES

Name of Variety	Source of Seed	Yield per Acre					
		Green weight		Oven-dry weight		Three-year average oven-dry weight	
		tons	lb.	tons	lb.	tons	lb.
Purple Top Greystone Mammoth	Sutton	28	600	2	1,527	1	1,664
Purple Top Mammoth Imp. Greystone	Steele Briggs	25	910	2	526	1	1,506
White Globe	Ewing	26	1,280	2	784	1	1,346
Hardy Green Round	Sutton	22	1,750	2	379	1	1,281
Red Paragon	Sutton	27	1,850	2	524	1	1,039
Pomeranian White Globe	Steele Briggs	21	240	1	1,793	1	945

DATES OF SOWING FALL TURNIPS

Mammoth Greystone fall turnips were sown at five dates of one week intervals commencing on the 19th of May. The results from the following table indicate that early sowing is desirable.

Roots sown early enough in the year to make full growth by the time they are required for feed in the fall will naturally have stored more food by that time than those planted later. Once fall turnips have attained full maturity, they quickly rot if left in the ground.

The period required to mature fall turnips is about 120 days and these roots should be sown early enough for the attaining of full maturity when they are required for use.

DATES OF SOWING FALL TURNIPS

Date of Sowing	Yield per Acre		
	Green weight	Oven-dry weight	Two-year average oven-dry weight
	tons lb.	tons lb.	tons lb.
Sown May 19	36 1,270	3 82	2 546
Sown one week later	27 1,880	2 580	1 1,689
Sown two weeks later	30 1,350	2 1,270	2 245
Sown three weeks later	33 630	2 1,336	1 1,341
Sown four weeks later	17 880	1 1,202	1 208

CARROTS

The yields of carrots were above average this year, although they were damaged considerably by cutworms. The roots were of good size also which facilitated harvesting. Thirteen varieties were under test and the yields of the six highest producers are shown in the following table.

CARROT VARIETIES

Name of Variety	Source of Seed	Yield per acre	
		Green weight	Air-dry weight
		tons lb.	tons lb.
James	McFayden Seed Co	14 1,340	1 1,608
Ontario Champion	Graham Brothers	13 270	1 411
Mammoth White Intermediate	Rennie	11 1,870	1 191
Mammoth Half Long	McKenzie Seed Co	11 1,570	1 600
Danish Champion	Hjalmar Hartman & Co	10 1,900	.. 1,421
Half Long White	General Sweedish Seed Co	10 1,480	1 412

SUGAR BEETS

Eight varieties of sugar beets were tested this year. Horning, from seed supplied by the Dominion Sugar Company, again out-yielded all other varieties as in 1924. The following table shows the yields in green and oven-dry weights.

SUGAR BEET VARIETIES

Name of Variety	Source of Seed	Yield per Acre	
		Green weight	Oven-dry weight
		tons lb.	tons lb.
Horning	Dominion Sugar Co	12 500	2 1,406
Schreiber & Sons	Dominion Sugar Co	11 800	2 542
Rabbethge Griseke	Dominion Sugar Co	10 1,370	2 632
Vilmorin's Improved	Andrieux & Sons	10 1,370	2 286
Henning & Harving	Dominion Sugar Co	10 890	2 325
Home Grown	Dominion Sugar Co	10 540	2 252
Dippe	Dominion Sugar Co	9 1,210	2 92
Dr. Burgman	Dominion Sugar Co	9 910	2 358

FALL TURNIPS

Thirteen varieties of fall turnips were under test and yields were well above average. A three-year-average yield of dry matter per acre is given in the following table for the six highest producers. The three-year average shows Sutton's Purple Top Greystone Mammoth a little higher than its nearest competitor, Steel Briggs Purple Top Mammoth Improved Greystone. These two easily out-yield other varieties tested here during the past three years.

POULTRY

The work with poultry has been mainly a continuation of experiments and the keeping of pedigree records with a view to establishing a strain of Barred Plymouth Rocks of high-production qualities. A gradual improvement can be noticed in the more uniform shape and colour of the birds, while higher producing qualities have been obtained as a result of careful selection and mating of females of strong constitution and vigour with males of a high-producing strain. By this method the quality and laying capacity of the flock has been increased with each generation. The introduction of males of heavy-laying strains from other Experimental Farms has helped largely to this end. All birds are trap-nested and eggs from the best hens are incubated separately and accurate records kept of the chicks in order to preserve their identity.

It is generally understood that for winter egg-production, pullets give better results than do older birds. However, to do so they must be hatched early in April or earlier, and be fully developed before cold weather begins. The following record of eggs laid from November 1, 1924 to March 31, 1925, inclusive illustrates this:—

—	Eggs laid per pen	Eggs laid per bird
50 Barred Rock hens	634	12·7
54 Barred Rock pullets	2,072	38·4

A number of the pullets had commenced laying previous to November 1, three of them laying their first egg in July, and up to March 1, ten birds had laid an average of 88 eggs.

INCUBATION

Three Buckeye and three Cyphers machines were used for artificial incubation during the season of 1925. In order to increase the humidity within the machines a small pad made of hemp was hung to the ceiling of the incubation chamber. This pad was soaked in warm water twice daily and all excess water pressed out before placing it on the hook in the incubator.

Seventy-four per cent of the total eggs set were gathered from pullets. As these pullets had been forced for production during the winter months the percentage of fertile eggs was low and the hatch poor. The hatching results are tabulated in the following tables:—

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 when three weeks old	Total fertile eggs for one chick hatched	Total eggs required for one chick three weeks old
Hens	1,302	87·1	40·1	46·0	88·3	2·1	2·8
Pullets	3,755	77·4	20·4	26·3	81·3	3·8	6·0

The results as shown in the preceding table would indicate that it is a wrong practice to depend on eggs from pullets which have been laying throughout the winter to produce strong healthy chickens. Undoubtedly heavy winter egg-production tends to lower the vitality of the birds especially pullets, so that they are not in condition to produce strong hatchable eggs in the early spring. Hence for best results in hatching dependence is placed on hens which have not been pushed abnormally and whose vitality has not been weakened by the demands of heavy egg-production throughout the winter.

Time Set	Total eggs	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched	Per cent chicks hatched alive when three weeks old	Total fertile eggs for one chick hatched	Total eggs required for one chick three weeks old
February	524	67·5	23·0	34·1	85·9	2·9	5·0
March	1,007	80·5	20·1	25·0	90·1	3·9	5·5
April	2,161	82·9	25·1	30·2	84·8	3·3	4·6
May	1,364	79·5	30·9	38·8	79·8	2·5	4·0

RESULTS FROM DIFFERENT MAKES OF INCUBATORS

Incubator	Total eggs set	Per cent fertile	Per cent total eggs hatched	Per cent fertile eggs hatched	Per cent chicks hatched alive when three weeks old	Total fertile eggs for one chick hatched	Total eggs required for one chick three weeks old
Buckeye	2,585	79·8	29·5	37·0	87·7	2·7	3·9
Cyphers	2,471	80·0	23·0	28·7	79·4	3·6	5·6

REARING YOUNG CHICKS

Chicks are removed from the incubator and taken to the brooder-house when 36 to 48 hours old. They are given clean water to drink and some chick-sized grit to pick. Twelve hours later they are given their first feed which consists of dry bread crumbs and oat meal. This is gradually replaced by a mixture of two parts corn meal, one part hulless oat-chop, one part shorts, and 5 per cent fine oyster-shell. Good results have been obtained by feeding the mash moistened to a crumbly state with different supplements such as sweet milk, tomatoes and hard-boiled infertile eggs. Care must be taken to make sure this moist feed is not fed in a soured condition.

For the inexperienced it is advisable to weigh the feed and it is imperative that chicks be fed at regular intervals during the day. One ounce of feed per fifty chicks fed six times a day is quite enough for the first week. About the tenth day the ration is gradually changed until it includes a light feed of cracked grains scattered in the litter twice daily. After the first week the chicks are given all the sour milk or buttermilk they will drink and are supplied with some form of green feed, such as sprouted grains or finely chopped cabbage.

May and June-hatched chicks are fed a wet mash throughout the summer in order to hasten the development of the pullets and to have the cockerels ready for the early fall market.

It is essential that the coop be maintained in a clean condition and free from lice. Give the chicks plenty of exercise but do not let them out in bad weather. Feed regularly and do not overcrowd the chicks.

An account was kept of the cost of eggs, coal-oil, coal and feed (not labour or equipment) required to produce a two-month-old chick. These particulars are tabulated in the following table:—

COST OF TWO-MONTH-OLD CHICK

Number of eggs set		5,056
Number of chicks hatched		1,289
Number of chicks alive when wing banded		1,085
Cost of 5,056 eggs at 50 cents per setting of fifteen	$	168 50
Gallons of coal-oil used in incubators		65 00
Cost of 65 gallons of coal at 25 cents		16 25
Pounds of hard coal used in brooder stoves		6,000
Cost of 6,000 pounds of hard coal at $21.25 per ton	$	64 50
Pounds of soft coal used in incubator cellar and brooder stoves		4,000
Cost of 4,000 pounds of soft coal at $9 per ton	$	18 00
Total cost of feed	$	86 80
Cost of eggs to produce each 2-month-old chick	$	0·1553
Cost of coal-oil to produce each 2-month-old chick	$	0·0149
Cost of coal to produce each 2-month-old chick	$	0·0760
Cost of feed to produce each 2-month-old chick	$	0·0800
Total cost of eggs, coal-oil, coal and feed to produce each 2-month-old chick	$	0·3262

REARING COSTS

An account was kept of the feed cost of three lots of pullets representing hatches of April 1, May 1 and May 28. Lot 1 consisted of twenty-five pullets and two and three of fifty pullets each. The cost of feed for each month was worked out on the basis of one bird. Until the pullets could be distinguished from the males the feed cost per chick was applied to the cost of raising a pullet after they were divided.

The mixture of corn meal, hulless oats, shorts and bone meal formed the basic part of the ration until the chicks were one month old. This mixture was valued at 2¼ cents per pound. After the first month the mash consisted of oat-chop 1½ parts, bran 1 part, shorts 1 part with 7 per cent beef scrap, 5 per cent bone meal and 1 per cent salt. This mixture cost a trifle more than 2 cents per pound. The whole grain consisted of two parts wheat to one of oats and cost 1¾ cents per pound. The buttermilk cost 1 cent per gallon. As the season advanced the mash and scratch mixtures were increased by the addition of a small percentage of barley.

The condensed table that follows shows the feed costs of rearing pullets of different ages up to October 31:—

FEED COSTS IN RAISING PULLETS

Date Hatched	April	May	June	July	August	Sept.	Oct.	Final average weight	Feed cost per pound	Total feed cost per pullet
	cents	cents	cents	cents	cents	cents	cents	lb.	cents	cents
April 1	2·25	6	6·75	9	11	12·25	14	5·2	11·7	61·25
May 1	.....	2·75	5	6·5	11·75	15·75	14·25	4·6	12·2	56·25
May 28	.....	.....	3	5	6·75	12·5	13	3·9	10·3	40·25

Several of the early-hatched pullets commenced to lay in October but were not given credit for the eggs in the preceding table. The range for each lot was one on which a crop of oats was growing. As considerable of this crop matured, it did, to some extent, reduce the cost of rearing to say nothing of the shade provided and the exercise gained.

FEEDING EXPERIMENT

A test was made to determine the difference, if any, between barley and oats as an addition to feed wheat for a scratch ration for laying hens. The experiment was conducted from December 16, 1924 to April 17, 1925, with the following results:—

Number of Birds	Total eggs laid	Value	Feed Costs				Total cost of feed	Cost per doz. eggs	Profit over cost
			Wheat	Barley	Oats	Mash			
		$	$	$	$	$	$	cts.	$
Group 5–26	693	17 20	5 75	3 45	.....	7 45	16 65	29	0 55
Group 6–26	792	18 85	4 45	.....	3 10	7 00	14 55	22	4 30

This experiment has been conducted only once and must therefore be considered as inconclusive. The barley was not the best and carried a large number of awns while the oats were choice. Not all the barley was eaten, which created a greater demand on the wheat and dry mash. It is intended to repeat this experiment with a better quality of barley.

MILK VS. WATER

This experiment was conducted to find out the increased results in egg-production from the giving of milk to drink instead of water. A number of pullets of even weight and age were divided in two groups of twenty-seven birds each, and fed the same scratch and mash mixture with the exception that group No. 1 was given skim-milk only to drink and group No. 2 water.

The period of the experiment was from December 1, 1924, to April 30, 1925, inclusive.

—	No. of birds	Total eggs laid	Value	Cost		Total cost of feed	Cost per doz. eggs	Profit over cost
				Feed	Milk			
			$	$	$	$	cents	$
Group 1	27	1,347	36 00	22 90	3 80	26 70	23	13 10
Group 2	27	1,013	25 20	18 50	.....	18 50	22	6 70

CRATE-FATTENING COCKERELS

A comparison of several mash mixtures was made in fattening cockerels for market and the table below would show that while results are close in all lots, those receiving equal parts oat meal and barley meal gave the cheapest gains.

The one hundred and twenty cockerels were equally divided as to weight and general conformation into five lots and placed in slatted crates. These were housed in a shed open to the south and fed the following rations mixed with sufficient skim-milk to make a batter. The rations were equal parts each of (1) Oat meal, barley meal and shorts. (2) Oat meal and barley meal. (3) Hulless oat meal and barley meal. (4) Sifted oat meal and sifted barley meal. (5) Oat meal and shorts.

—	1	2	3	4	5
Number of birds	24	24	24	24	24
	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
Initial weight	102 0	104 8	102 0	105 0	107 8
Finished weight	133 8	135 8	133 0	135 0	132 8
Total gain in 21 days	31 8	31 0	31 0	30 0	25 0
Average gain per bird	1 5	1 4	1 4	1 4	1 0
Total mash fed	165 0	157 0	147 0	144 0	160 0
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Cost of feed including milk	2 59	2 36	2 59	3 35	2 55
Cost per pound of gain	0 082	0 076	0 083	0 112	0 102

MARKET VALUE OF FEEDS USED IN RATIONS

Oat meal	$1 25 per hundred pounds.
Barley meal	1 33 per hundred pounds.
Shorts	1 50 per hundred pounds.
Hulless oat meal	1 75 per hundred pounds.
Sifted oat meal	2 00 per hundred pounds.
Sifted barley meal	2 16 per hundred pounds.
Skim-milk	0 01 per gallon.

CRATE-FEEDING VS. PEN-FEEDING COCKERELS

Former experiments carried on here have proven that crate-fed birds make more profitable gains than do pen-fed. This year, however, slightly better results were obtained from those fed loose in the pen. The crate-fed birds made a greater gain in weight but at a higher cost per pound.

Each lot received the same mash mixture of equal parts of oat meal, barley meal and shorts.

—	Pen fed	Crate fed
Number of birds	24	24
	lb. oz.	lb. oz.
Initial weight	95 8	104 0
Finished weight	122 8	133 8
Total gain in 21 days	27 0	29 8
Average gain per bird	1 2	1 3
Total mash fed	126 8	165 0
	$ cts.	$ cts.
Cost of feed including milk	2 10	2 60
Cost per pound of gain	0 077	0 088

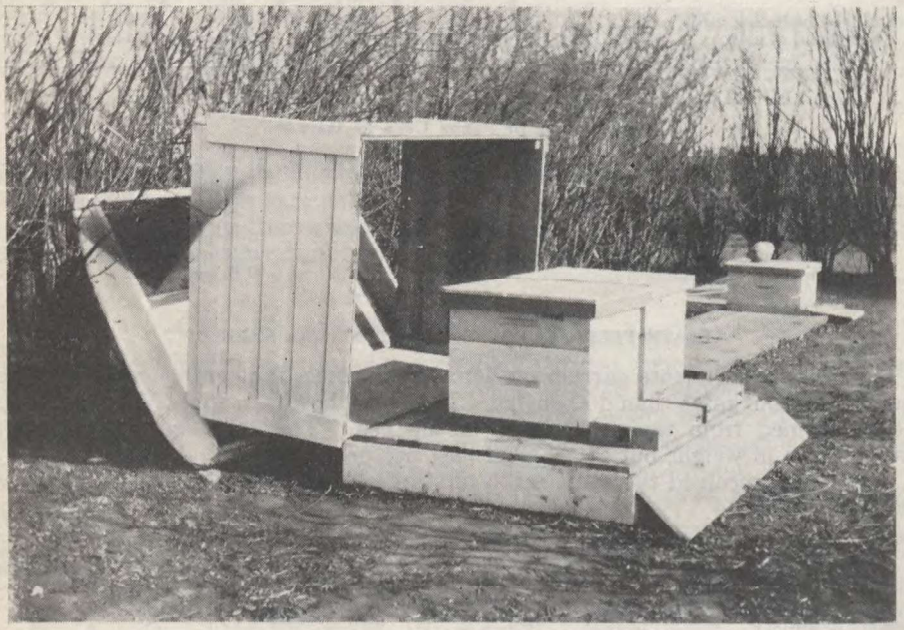
BEES

A start was made with bees in 1923 and the work continued through 1924 and 1925. Two colonies were prepared for the winter of 1924 and 1925, two quadruple and two single outside-wintering cases being used. One of these colonies was double, there being two queens, one on each side of a bee-tight division-board in the centre of the hive and a separate passage and flight-hole for each half.

Mild weather during the late fall of 1924, after feeding and packing was completed, caused some clustering-out of the bees at the flight-holes and these were chilled during the cool nights, considerably weakening numbers 201 and 202 (see table following). This loss is being overcome by withholding some of the

top packing until cold weather has set in and also by using tunnels two inches deep instead of half an inch; thus allowing the bees a larger space in which to cluster.

Many wet and windy days during spring kept the bees from working freely on the early flowers but pollen was seen coming in on April 7 from the prairie crocus, two days after the snow had gone from the fields. All colonies were inspected at this time and ten were found to be alive but one half of the double colony was queenless and the bees were united to the other half by withdrawing the division-board.



Double-colony wintering-case.

The average number of combs in each colony covered by bees was five and there were three and a half combs of honey left over from the winter stores so that spring feeding was not necessary. The condition of each colony at the time of first inspection is summarized in the table on wintering.

WINTERING

Hive No.	Weight of Stores		Stores consumed	Number of Combs Covered by Bees		Number of combs with brood April 7	Remarks
	In fall	In spring		In fall	In spring		
	lb.	lb.	lb.				
201	36·3	16	20·3	9	3	0	
202	43·2	20	23·2	10	4	1	
203 "D"	40	14	26	10	6	1	One queen lost.
204	39·3	16	23·3	10	5	1	
205	39·3	16	23·3	10	5	1	
206	36·6	14	22·6	10	5	1	
207	40	14	26	10	5	1	
208	37·3	16	21·3	10	5	1	
210	40·6	12	28·6	10	5	1	
278	40	12	28	8	6	2	

It will be noticed that the weakest colony in the fall, No. 278, was the strongest in the spring. This colony was the only one to be requeened in the fall of 1924 and shows the value of having young queens, which will keep laying late in the fall and start early in the spring. All other queens were those imported with the packages.

In the spring of 1925 five 3-pound and five 2-pound packages with queens were again ordered from Texas and arrived on May 28. Two of the cages had only a few bees left alive in them and two others were lost through suffocation after arrival. Of the six colonies started, four were kept for honey-production, two of these from 3-pound packages and two from 2-pound packages. The other two colonies were used for queen-rearing and increase, a nucleus being made from each. The colonies resulting from 3-pound packages produced a little more honey but did not build up any stronger nor more quickly than did those from the 2-pound packages. If packages arrive later than early in May they do not have time to build up sufficiently to take advantage of the maximum honey-flow which begins in July. Packages should be ordered to arrive early in May at the latest and some protection from the cold should be provided at this time. Sacks stuffed with straw placed around three sides of the hive will answer this purpose, and should be kept there as long as he weather remains cool. Care must be taken to see that plenty of food is supplied to the bees until flowers are abundant and nectar is coming in.

Combs of sealed honey kept over from the previous season are used for this purpose here; but where the beginner has no combs and wants to make a start from packages, the bees have to be released on frames with wax foundation only. Sugar syrup (one cup of sugar to one of water) given generously at this time greatly helps to get the combs built by the bees and to keep the queens laying and to feed the young larvæ.

Five or six frames were given to start with and a division-board placed so as to keep the frames together at one side of the hive and the empty space packed with sacking. Frames were added with foundation as required, one or two each week usually, and a super was placed above when the bees began working on the outside frames. If one of the drawn combs with sealed brood is placed in the middle of the frames in the super, it will act as a good bait to draw the bees into the supers and get them to start work there. The nine frames left in the bottom chamber are pushed together and another frame placed in the empty space at one side.

The honey-flow from caragana at the end of May and early June stimulated brood-rearing in the old colonies and got them into good shape for the main flow, which occurred in July, the peak being reached on July 11, when the colony on scales registered a gain of eight pounds. The wet weather in August and September made the fall flow very intermittent, although the moisture kept the alfalfa and sweet clover blooming until killed by frost.

The total production for the season was 830 pounds of honey. The ten colonies yielded 610 pounds and also gave eight nuclei. The four colonies from packages kept for honey production gave 220 pounds. It must be noted that practically all the combs in the supers had to be built from foundation before surplus could be stored. An average of fourteen combs were built by each of the fourteen honey-producing colonies.

The honey was of a much lighter colour and finer flavour than that of the previous year. Some sweet clover is now being grown in the district and the bees were seen working in a field three miles from the apiary, preferring the clover to the prairie flora.

The table below gives the honey-flow as recorded by the hive on scales and the chief sources of nectar from June 1 to September 15.

RECORD OF COLONY ON SCALES

Month	Number of days showing gain	Number of days of gain of 1 lb. or more	Total gain per month	Average daily gain	Chief sources of nectar
			lb.	lb.	
June	15	5	8·50	0·28	Caragana, dandelion, fruit trees, ornamental shrubs and white clover.
July	27	24	94·25	3·04	White Dutch and sweet clover, alfalfa and buckwheat.
August	18	12	24·75	0·08	White Dutch and sweet clover, alfalfa and buckwheat.
Sept. (half)	6	4	4·0	0·26	White Dutch and sweet clover and alfalfa.

The main work done has been in building up the apiary, studying honey-flows, queen-rearing and outside wintering. It has been found that package-bees when received in May in good condition will develop into strong colonies and give a fair surplus but not so much as over-wintered colonies.

The eight nuclei made from the old colonies were very slow in building up, the weather being unsuitable for this after July. Four were united to others as they were too weak to winter and their queens were poor ones. The two nuclei from the queen-rearing colonies from packages were in fair shape for wintering. In the queen-rearing experiments some difficulty was met in getting the virgins mated, in that they were lost during the mating flights. Thirteen colonies are now headed by young queens raised at the Station, six by queens imported with the packages and three have second-year queens.

All twenty-two colonies are being wintered outside, twenty in quadruple cases and two in single cases. Planer shavings are being tried out in two of the cases as an insulating material, and cut straw and chaff is again being used in the others.

The condition of each colony in the fall and its production for the season is given in the following table.

PRODUCTION PER COLONY AND CONDITION IN FALL

Colony No.	Kind of Colony	Production		Condition in Fall		
		Honey	Increase	Number of combs covered by bees	Weight of colony before feeding	Amount fed pounds sugar
		lb.			lb.	
201	Over-wintered	26·2	.....	10	51	19·5
202	Over-wintered	22·5	1 nuclus	10	48	21·5
203	Over-wintered	96	1 nuclus	10	57	22
204	Over-wintered	85·2	1 nuclus	10	49	25
205	Over-wintered	32·5	.....	10	53	21·5
206	Over-wintered	37·5	1 nuclus	10	56	24
207	Over-wintered	76	1 nuclus	10	50	20
208	Over-wintered	78·7	1 nuclus	10	53	21
210	Over-wintered	44	1 nuclus	10	52	22·5
278	Over-wintered	111·5	1 nuclus	10	50*	21·5
211	Package	26·2	.....	10	55·5	22
212	Package	53	.....	10	50	20
215	Package	51·5	.....	10	55·5	17·5
216	Package	83	.....	10	52	17
218	Package	.....	1 nuclus and queens	8	43	16
219	Package	.....	1 nuclus and queens	8	45*	18
209	Increase	.....	.....	6	41	17·5
213	Increase	.....	.....	10	49	22·5
214	Increase	.....	.....	7	48	19·5
217	Increase	6	.....	9	50·5	17
221	Increase	.....	.....	9	49	22
222	Increase	.....	.....	9	44·5	22

*These were not weighed as they were in single Kootenay cases all season and the weights given are only approximate.

OTTAWA: Printed by F. A. ACLAND, Printer to the King's Most Excellent Majesty, 1926.