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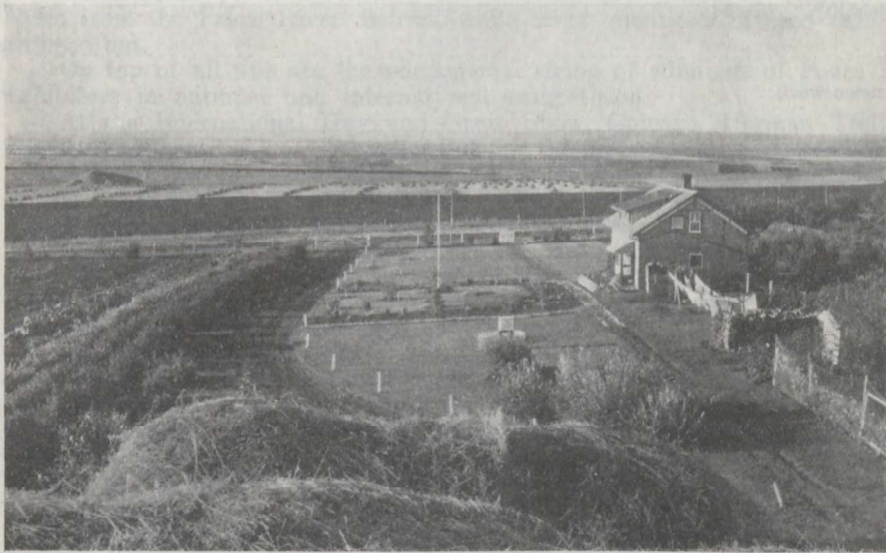
DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL SUB-STATION

BEAVERLODGE, ALBERTA

REPORT OF THE SUPERINTENDENT
W. D. ALBRIGHT

FOR THE YEAR 1927



Lawn and Superintendent's residence, Beaverlodge. Valley in the distance.

Printed by authority of the Hon. W. R. Motherwell, Minister of Agriculture,
Ottawa, 1928

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DOMINION EXPERIMENTAL SUB-STATION BEAVERLODGE, ALBERTA

REPORT OF THE SUPERINTENDENT, W. D. ALBRIGHT

INTRODUCTION

A second successive bumper crop was harvested in 1927. This time yields were universally good throughout the whole of the Upper Peace River region.

So numerous were the reports of fifty and sixty bushels of wheat per acre that citizens tired of the tale and ceased to tell it.

The official record for a field yield was 1,702.9 bushels (by weight) of Red Bobs wheat, grown by Charles B. Anderson, of the Pouce Coupe district, on 22 acres. This is an average of 77.4 bushels per acre. The grain tested 64 pounds to the bushel. The facts were investigated by the provincial government and by the Soldier Settlement Board, whose field supervisor, J. A. McLeod, obtained from the grower an affidavit in which he declared that the yield was obtained after an estimated loss of some four bushels per acre from lodging, waste at threshing, and hog trespass on one or two occasions.

Mr. Anderson is a mixed farmer, of Swedish extraction, who lives on the high rolling land north of Rolla, B.C., having come to the district fourteen years ago from Nebraska.

If any further evidence of Peace River production were needed it might be found in the mounting volume of grain shipments.

As to quality, it is significant that Alberta's best grades of wheat in 1927 came from the Peace River district, while large quantities of seed oats were shipped out.

On top of all this are the phenomenal string of winnings of Peace River exhibitors in national and international competition.

At the International Hay and Grain Show, Chicago, Herman Trelle, of Wembley, annexed the oat championship for the second year in succession with a sample of Victory oats weighting 49.6 pounds per Winchester bushel, the heaviest oats ever exhibited in the show. He was also first in the hard, red spring wheat class with a selection of Reward wheat, losing the championship to a sample of winter wheat that weighed one and a fifth pounds less per bushel than the Trelle spring wheat, which was awarded reserve. Mr. Trelle's wheat tested 66.8 pounds per Winchester bushel—being considerably more than the heaviest winter wheat ever shown at Chicago.

Mr. Trelle also won reserve championship in field peas with an exhibit of Chancellor, grown from seed supplied in the spring of 1927 by the Beaverlodge Station. At the same show Robert Cochrane, of Grande Prairie, won second on timothy seed. Both exhibitors followed up their international success by a series of practically clean sweeps at Western Canadian seed fairs and summer exhibitions. In all, Mr. Trelle had won down to the end of 1927, thirty major awards, including eight championships. He had also won three trophies and three cups. Mr. Cochrane had won two firsts at Provincial Seed Fairs, never being beaten in Canada.

Not in grain alone were northern exhibitors successful. At the Calgary Spring Show, John M. Lamont, of Cuchullin Stock Farm, Berwyn, won the Shorthorn grand championship with Cuchullin Prince, a bull of his own breeding, sired by King of the Fairies. Cuchullin Prince later sold for \$400. At the same event Mr. Lamont also won a first and fourth prize with his showing of six home-bred bulls, and in the sales obtained the highest average price in the Shorthorn classes.

It becomes increasingly evident that in grain, in live stock, in citizenship and in human achievement the Peace River country is destined to excel.

A decided influx of population has set in. Homestead entries reflect this unmistakably. From January 1, 1927, to December 31, 1927, 675 entries including 32 soldier grants, were filed at the Dominion Lands Office in Grand Prairie, and 647 entries including 38 soldier grants, at the Lands office in the town of Peace River.

It was estimated by the two land agents questioned that from twenty to thirty-five per cent of these filings were on land formerly entered, the remainder being on new land.

During the fiscal year closing March 31, 1928, homestead entries at the Grand Prairie office totalled 909, in addition to 49 soldier grants, comparing with 241 entries during the preceding year. The Peace River office had 854 homestead entries and 48 soldier grants so that the totals for the two were 1,763 homesteads and 97 soldier grants. Assuming three persons per homestead, this would represent an influx of 5,289 additional settlers within twelve months.

Much patented land also changed hands, while energy in clearing and breaking was everywhere manifest.

That the bounds of successful agriculture are still capable of indefinite extension northward is indicated by the fact that the Roman Catholic Mission at Fort Good Hope, far down the MacKenzie and within the Arctic Circle, raised 125 bags of potatoes off a small piece of ground, as well as good, large, hard cabbages and other vegetables, according to advice of Walter Gibson, a trader of that region.

In August, 1928, Rev. Father Robin, O.M.I., sent the Beaverlodge Station a smooth, clean, shapely tuber of the 1927 crop. It was well preserved and weighed when despatched seventeen ounces. When received a month later it still weighed over a pound.

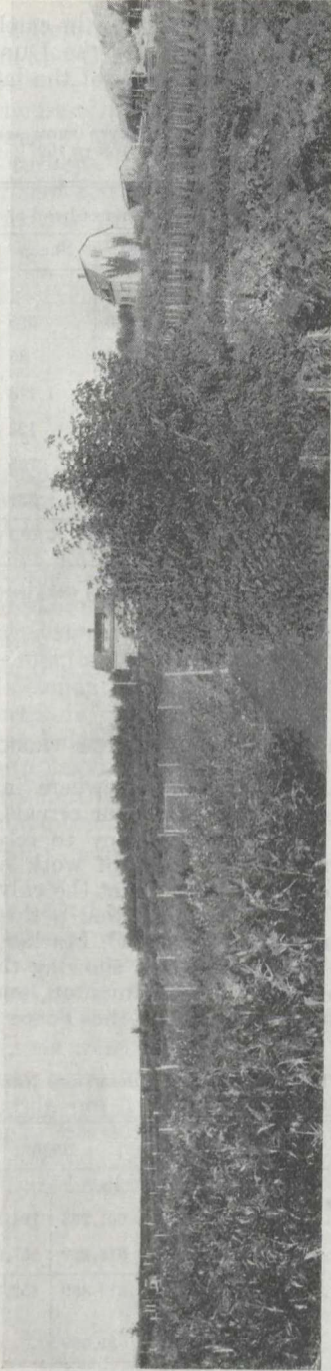
GRAIN SHIPMENTS

Grain shipments on the Dunvegan lines reached a grand total of 7,128,080 bushels of wheat and 3,080,745 of coarse grains or 10,208,825 bushels in all. Of this more than five millions of wheat and upwards of two and a quarter million bushels of coarse grains or approximately seven and a half million bushels all told grew in the Peace watershed.

The Alberta and Great Waterways Railway leading northeast from Edmonton carried 868,120 bushels of wheat and 429,685 of coarse grains, making a total of 11,506,630 bushels of grain transported by the two provincially owned systems.

SHIPMENTS OF GRAIN BY DISTRICTS ON THE DUNVEGAN LINES
From August 1, 1927 to July 31, 1928

Commodity	Edmonton to Athabasca River	Pembina Valley Railway	Smoky River to Spirit River	Athabasca to Smoky River	Roycroft to Wembly (chiefly Grande Prairie)	McLennan to Whitelaw (chiefly north of Peace)	Grand total
	bush.	bush.	bush.	bush.	bush.	bush.	bush.
Wheat.....	1,496,206	297,798	690,946	342,913	2,332,273	1,967,944	7,128,080
Other grains.....	545,111	47,793	364,581	477,716	1,059,898	585,640	3,080,745
Total all grains.....	2,041,317	345,591	1,055,527	820,629	3,392,171	2,553,590	10,208,825



Panoramic view of garden and buildings, looking west.

DECREASE IN CATTLE SHIPMENTS

Live stock shipments registered a decrease in cattle but an increase in the number of hogs. This was true not only for the Dunvegan lines but likewise for the aggregate of all lines in Alberta north of the latitude of Edmonton.

SUMMARY PRESENTING STATISTICS OF LIVE STOCK SHIPMENTS FROM ALL THE RAILWAYS OPERATING IN ALBERTA NORTH OF EDMONTON IN 1927

	Number of head of each class					Number of cars
	Cattle	Hogs	Sheep	Horses	Total	
Dunvegan line, tapping chiefly Peace River District.....	9,650	26,000	595	580	36,825	747
A. and G.W. Railway, running north-eastwardly from Edmonton.....	975	6,240	85	260	7,560	131
St. Paul Branch, Canadian National Railways.....	6,253	23,956	1,178	246	31,633	.....
Athabasca Branch, Canadian National Railways.....	2,599	6,242	128	195	9,164	.....
Whitecourt Branch, Canadian National Railways.....	3,164	10,693	765	262	14,884	.....
St. Albert to Magnolia Branch, Canadian National Railways.....	940	1,856	331	61	3,188	.....
Total all lines north of Edmonton.	23,581	74,987	3,082	1,604	103,254	.....

On A. and G.W. and E.D and B.C. the following estimates were used to arrive at number of animals per carload:—

Cattle and calves.....	25 head per car
Hogs.....	80 " "
Sheep.....	85 " "
Horses.....	20 " "

FURTHER DECLINE IN BUTTER PRODUCTION

An old story is being repeated. As elsewhere in the west when bumper grain crops are accompanied by good prices for cereals, the swing is away from mixed farming. Not only is there a tendency to rely more exclusively upon grain as a source of revenue but the rush of work entailed by an enormous harvest tempts men to neglect their cows or let the calves run with them. Consequently, while creamery butter prices showed a three-cent improvement the total value dropped substantially. To Mr. C. Marker, Provincial Dairy Commissioner, we are indebted for a tabulation showing the comparative makes in the thirteen Alberta creameries north of Edmonton, and to these are added the returns of the Pouce Coupe creamery in the Peace River Block of British Columbia.

PRODUCTION IN THIRTEEN ALBERTA CREAMERIES NORTH OF EDMONTON

	1926		1927	
	lb.	\$	lb.	\$
Five Alberta creameries shipping over Dunvegan lines.....	601,268	194,888 82	427,506	150,779 00
Eight Alberta creameries shipping over C.N.R. and A. and G.W. lines from points north of Edmonton.	818,222	257,854 61	770,260	266,217 63
Totals, 13 creameries.....	1,419,490	452,743 43	1,197,766	416,996 63
Average price.....		31·8c.		34·8c.
Decrease.....				15·62%
Pouce Coupé creamery.....	31,589		22,696	7,951 40
Total, 14 creameries.....	1,451,079		1,220,462	424,948 03

POULTRY

A. R. Judson, District Representative of the Provincial Department of Agriculture, reports that from the Grande Prairie and Spirit River districts 60,500 pounds of dressed turkeys were shipped co-operatively and a small co-operative shipment of some nine thousand pounds went from north of the Peace as well. Flock losses had been heavy, due to an obscure affection attributed to an unfavourable season for turkeys. However, while the season's production was only about 70 per cent of that of the previous year, an increased percentage was shipped co-operatively, netting producers the following prices:—

No. 1, over 12 pounds.....	35½	cents per pound.
No. 1, 10 to 12 pounds.....	33½	“ “
No. 1, 8 to 10 pounds.....	30½	“ “
No. 1, 6 to 8 pounds.....	27½	“ “
Old Toms.....	26½	“ “
No. 2, over 10 pounds.....	25½	“ “
No. 2, under 10 pounds.....	22½	“ “

THE SEASON

Snow lay later than usual, and the first experimental plots were sown May 5. Five and a half inches of snow on the twenty-sixth of May, combined with timely showers of rain, gave 2·38 inches of moisture in that month. June added 2·78 inches, and July 2·98. The latter half July and the forepart of August brought a period of fairly hot, dry weather, relieved at Beaverlodge by a beating thunderstorm on August 6, accompanied by one half inch of rain. This put down much grain that never rose again. More moderate temperatures prevailed towards the close of the month. September was sprinkled by persistent light showers with considerable cloudy weather, and snow for variety on the twenty-fourth. Grain not matured in August lingered provokingly in September, especially that which was lodged. Touches of frost occurred on the second, sixth, seventh and fifteenth, leaving its mark on the bran of the exposed heads of stooks, since rain and damp weather had swollen the kernels even of grain which had been cut for some time.

These conditions, whilst permitting an ample yield, tended to lower the grades in three ways.

First, the midsummer period of hot, dry weather resulted in prematurity of some of the heads and kernels, while the cooler and moister weather ensuing expanded other kernels so that it was not unusual at harvest to find small hard kernels and large, soft ones in the same head. The latter shrank more or less in curing and the outcome was a sample lacking in uniform plumpness.

Secondly the stook frosts were general and had considerable effect.

Thirdly, rain and snow, persistent through most of September and October, weathered much of the grain ere it could be threshed and resulted in a great deal being marketed tough. Stacking avoided this in some cases but comparatively little grain was stacked. Some farmers marketing small lots of dry grain had to accept tough grading because the congested elevators could not bin their grain as it deserved.

1927 METEOROLOGICAL RECORDS

Month	Temperature, degrees Fahrenheit				Precipitation, inches			Evaporation		Sunshine		Sleighting							
	Maximum		Minimum		Mean		Rain	Snow	Average 12 years	1927	Inches	Average 6 years	1927	Hours	Average 5 years	1927	Days	Average 12 years	
	Highest	Mean maximum	Lowest	Mean minimum	1927	Average 12 years													
January	38	17.77	-28	0.87	9.32	7.37		16.5	14.20	1.65				81.5	77.1	31	31.0		
February	41	22.14	-29	1.32	11.73	12.98		14.0	8.03	1.40				128.2	103.7	28	28.1		
March	46	36.51	-8	15.67	26.09	21.16		10.0	13.14	1.00				137.2	138.4	31	27.8		
April	61	44.56	-2	22.20	33.38	37.21		7.9	1.97	0.79				183.4	219.3	11	9.3		
May	72	58.03	26	36.13	47.01	47.76		6.2	2.18	2.38				269.2	287.0		0.5		
June	83	69.16	35	45.30	57.23	55.09		1.76	1.89	2.78				254.5	271.5				
July	87	72.87	41	48.00	60.43	59.71		2.78	2.98	2.98				318.7	289.3				
August	89	76.06	33	46.48	61.27	57.30			1.03	1.03				328.2	243.4				
September	77	60.83	21	37.87	49.35	48.49		3.5	1.87	2.27				173.0	171.4				
October	61	49.29	18	29.13	39.21	38.42		0.85	5.01	0.85				123.2	137.7		1.7		
November	48	14.00	-21	-0.47	7.68	23.47		14.5	8.49	1.55				102.6	91.6	25	8.1		
December	42	6.84	-38	-8.61	-0.88	10.00		20.0	13.39	2.00				83.7	69.9	31	27.0		
Average 1927		44.08		22.82	33.49	34.91													
Total 1927								92.6	70.17	20.68			19.23	2,183.4		157			
Average yearly total																			133.5

* From May 7. † To October 29. ‡ Six-year average. x Five-year average.

MEAN TEMPERATURES

Station	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Beaverlodge.....	9.32	11.73	26.09	33.38	47.07	57.23	60.43	61.27	49.35	39.21	7.68	-0.88	33.49
Berwyn.....	-3.0	5.5	23.5	30.5	49.0	58.0	61.0	62.0	48.5	37.0	5.5	-6.5	30.92
Elmworth.....	6.91	6.5	25.07	32.02	44.63	55.32	58.93	57.63	47.16	36.64	4.54	-6.05	30.78
Fort St. John.....	-0.25	12.5	28.0	33.4	47.7	57.9	62.2	63.7	49.9	38.6	7.84	-3.53	33.16

Observers: Dominion Experimental Station, Beaverlodge, Alta.; J. M. Lamont, Berwyn, Alta.; G. S. Moyer, Elmworth, Alta.; J. W. Abbott, Fort St. John, B.C.

PRECIPITATION

Station	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Beaverlodge.....	1.65	1.40	1.00	0.79	2.38	2.78	2.98	1.03	2.27	0.85	1.55	2.00	20.68
Berwyn.....	0.70	1.05	0.98	1.39	1.56	4.40	2.82	0.07	2.59	0.79	0.90	0.90	18.00
Elmworth.....	1.13	0.40	*1.00	0.5	2.34	2.56	3.65	0.22	2.75	1.06	0.90	0.90	17.41
Fort St. John.....	0.67	0.55	0.40	0.06	3.23	2.36	3.85	0.76	2.58	0.77	0.50	1.25	16.98

*Elmworth March precipitation taken the same as Beaverlodge.

CEREALS

Twenty-three leading varieties of spring grain were compared in drilled plots, while in the rod-rows there were 1,168 plotlets, exclusive of those devoted to a date-of-planting test. This year the rod-row plots were widened to include five drills, instead of three, as formerly. They were all replicated at least five times, while certain of the more important varieties were grown in octuplicate. The drilled plots were practically all in sextuplicate and represented three distinct preparations of the land, affording an incidental comparison on this score.

The field work in cereals as well as other phases of agronomy has been for the most part handled by Mr. E. C. Stacey, B.A., M.Sc., who has also composed some parts of the present report.

Mr. Stacey has also given considerable attention to the native grasses of the Grande Prairie District, reviewed in his thesis for the M.Sc. degree.

A LATE SEEDING

The variety test plots of wheat and peas were drilled May 5, the oats and barley on the seventh; the flax on the twentieth; the buckwheat on the thirtieth.

COPPER CARBONATE CONTROLLED SMUT

All the cereals in both drilled plots and rod-rows were treated with copper carbonate and very little smut was in evidence even on susceptible kinds such as Eureka barley. Ergot, however, was much more prevalent than usual.

Wireworms, troublesome the past couple of years, were but little in evidence on the Station this past season.

REPRESENTATIVE OF FIELD CONDITIONS

Borders were eliminated from the drilled plots of cereals and peas.

Two-pound samples of all grains were taken at threshing and absolute dry-matter determinations were made. Yields were accordingly expressed in terms of



View of experimental and commercial crop, September 7, 1927. Liberty multiplying oats in stook. Wheats in wireworm test still standing. Garnet and Reward multiplying blocks in stook beyond.

grain carrying only 12 per cent moisture. The legal limit for dry grains is 14.4 per cent. Equivalent corrections were made in calculating yields of total crop.

The Station's yields, although not equal to the remarkable ones produced in 1926, were nevertheless excellent. When comparing the two years' data, some allowance must be made for the fact that the 1926 yields were all after summer-fallow, while in 1927 one-third the area of each variety was sunflower stubble.

COMPARISON OF ROD-ROW AND DRILLED-PLOT RESULTS

By reason of diversity in the preparation, this comparison is less conclusive than that made in 1926, the rod-rows this year being after potatoes while the drilled plots followed corn, sunflowers and fallow. The parallel is again significant, however, and it is interesting to observe the degree of consistency manifested by the varieties in the two series.

It happens that with wheat only one variety can be compared in the two series. The rod-rows of Marquis yielded 15.5 per cent more per acre than the drilled plots.

The five oats occurring in the drilled plots preserved the same ranking in the rod-rows except that Banner was first in the former and Victory first in the latter. The five varieties averaged only 33.3 pounds more grain per acre from the rod-rows than from the drilled plots—less than one per cent.

With the six barleys, results as to variety-rating were less consistent, Gold being first in the drilled plots and fourth in the rod-rows. This was the most marked irregularity. Charlottetown No. 80 was first in one test and second in the other; Bearer second in one and third in the other, Hannchen third in one and fourth in the other. The remaining two varieties were alike in both tests.

Considering all six barleys, the net difference in yield was 24½ pounds per acre in favour of the rod-rows, or about three-quarters of one per cent.

Taking a quantitative average of the twelve comparable varieties of grain (one wheat, five oats and six barleys) the rod-rows yielded only 65.6 pounds more grain per acre than the drilled plots, or 1.9 per cent. This, conforming closely as it does to similar comparisons in the two preceding years, indicates that the rod-row system of testing does not give yields materially higher than those obtainable from larger plots or in field practice.

PERCENTAGE OF GRAIN TO TOTAL CROP

It is interesting to know about what percentage of a crop of sheaves is grain and what is straw. The percentage will vary, of course, with season, soil, variety, lodging and height of cutting. In a year such as 1927 the figures will be less instructive than usual. Still they may be worth keeping. There is a point of more or less practical value involved. In a short crop year, a certain settler was figuring closely on his forage supplies. From the number of bushels of oats he had threshed, he was told fairly closely about how many tons of straw he had, much to his assurance and satisfaction.

In 1927 the five wheats (all but Marquis being very early kinds) averaged 7,710 pounds of bundles and 50 bushels 49 pounds of grain, the grain being 39.55 per cent of the total crop.

The four oats (excluding the hulless) yielded 8,416 pounds total crop and 108 bushels 8 pounds of grain, the ratio being 43.73 per cent.

The five barleys (exclusive of the hulless kind) produced 7,355 pounds of bundles and 71 bushels 34 pounds of grain, the latter being 46.80 per cent by weight of the whole crop as harvested.

It may be observed from the table that the barley had the highest ratio of grain to total crop and that the oats produced the largest weight of both grain and bundles.

PERCENTAGE GRAIN TO TOTAL CROP WITH EIGHT KINDS OF GRAIN, 1927

Kind of grain	Number of varieties	Total crop per acre		Threshed grain per acre		Percentage grain to total crop
		Pounds	Standing	Pounds	Standing	
Oats (excluding hulless).....	4	8,416	1	3,680	1	43.73
Oats (all varieties).....	5	8,233	2	3,461	2	42.04
Winter rye.....	1	8,014	3	3,127	5	39.02
Spring wheat.....	5	7,710	4	3,049	6	39.55
Barley (excluding hulless).....	5	7,355	5	3,442	3	46.80
Barley (all varieties).....	6	7,110	6	3,366	4	47.34
Peas.....	3	5,821	7	2,691	7	46.23
Vetches.....	1	4,372	8	1,981	8	45.31
Winter wheat.....	5	4,036	9	1,575	9	39.02
Flax.....	1	2,635	10	1,031	10	39.13

SUNFLOWER STUBBLE, CORN GROUND OR SUMMER-FALLOW

In 1927 the variety-test drilled plots of spring-sown cereals represented three different preparations. One-third the area of each plot was on land where corn had been grown as a summer-fallow substitute in 1926. The corn had been stubbled in and made only a slight growth. Frost cut it down in a soft condition so that it could not be harvested but lay flat on the ground. In the spring it was disked and cultivated in. The adjoining third grew sunflowers in 1926. They were a fair crop and were harvested in the usual way. The remaining area was summer-fallow.

The three preparations were on a gradual slope, descending in order of mention. The cereal plots crossed the three preparations, one range being situated on each.

In spring the sunflower ground was conspicuously the driest, being the only area in good friable condition for seeding in early May. The corn ground possibly in part from accident of position, was somewhat less soggy than the fallow area.

No doubt because of its greater dryness, the sunflower ground showed the earliest and best germination. In spite of this fact and also in spite of the fact that some lodging occurred on the summer-fallow area, the sunflower land lost out at harvest, as the accompanying table signifies.

Averaging all the grain crops, it will be seen that those on sunflower ground had rather the shortest straw, which, however, stood most erect, matured about a day ahead of the crop on the corn ground and nearly three and a half days ahead of the summer-fallow crop. Yet it yielded only about 73 per cent as much grain as the corn ground and about 68 per cent as much as the fallow area.

In weight per measured bushel and in weight per thousand kernels there proved to be surprisingly little difference.

COMPARING YIELDS, ETC., OF THE VARIETY TEST CEREALS SOWN 1927 ON CORN STUBBLE, SUNFLOWER STUBBLE AND SUMMER-FALLOW

Kind of crop	Number of days to maturity			Average length of straw			Average strength of straw on scale of 10 points		
	Corn stubble	Sun-flower stubble	Summer-fallow	Corn stubble	Sun-flower stubble	Summer-fallow	Corn stubble	Sun-flower stubble	Summer-fallow
				in.	in.	in.			
Average 5 wheats.....	119.0	117.5	122.6	39.6	39.1	44.6	10.0	10.0	7.5
Average 5 oats.....	113.8	114.0	115.5	46.5	44.5	49.2	9.9	10.0	9.0
Average 5 barleys.....	114.0	113.0	117.4	41.0	41.5	44.1	7.6	8.2	7.0
Average 3 peas.....	126.6	125.5	128.0	44.0	37.0	56.8			
Average of all grains..	118.4	117.5	120.9	42.8	40.5	48.7			

Kind of crop	Yields in pounds of grain per acre			Weight per measured bushel			Weight per 1,000 kernels		
	Corn stubble	Sun-flower stubble	Summer-fallow	Corn stubble	Sun-flower stubble	Summer-fallow	Corn stubble	Sun-flower stubble	Summer-fallow
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
Average 5 wheats.....	3,314.8	2,422.3	3,409.5	64.58	63.75	63.92	34.40	34.17	33.73
Average 5 oats.....	3,796.9	2,617.7	3,968.7	44.35	41.8	43.6	32.1	28.0	31.1
Average 5 barleys.....	3,646.8	3,095.3	3,582.7	52.3	51.0	50.3	37.4	37.2	37.8
Average 3 peas.....	2,540.8	1,689.2	3,443.6	65.16	65.33	64.08	216.9	209.4	208.1
Average all grains....	3,324.8	2,456.1	3,601.1	56.60	55.47	55.47	80.2	77.19	77.68

WHEAT RUST

Of especial interest is the Uniform Rust-nursery project, conducted in co-operation with the Dominion Rust Research Laboratory, at Winnipeg. A number of varieties of grain, some chosen for their known susceptibility to rust, were seeded purposely late (June) and when growing were watched for rust-pustules. In September, when commercial grain crops were in stock, Dr. Margaret Newton found traces of rust in several varieties of wheat in this nursery, thus confirming deductions from adjacent spore traps, which had caught a light shower of spores between August 12 and 19, and still lighter showers later.

It is presumed that these spores had been borne by air currents from regions south and east, where they had matured earlier in the season. Inasmuch as the usual movement of our storms is from West to East and biologists doubt whether the spores will live over winter in the Peace River region, it is hoped that the district may remain substantially immune from the disastrous infestations which occur in the more easterly portion of the prairie wheat belt.

In 1926 the Beaverlodge spore trap had caught no rust spores whatever, and in 1927 only an insignificantly small number and those too late in the summer to constitute a menace to crops matured in ordinary season. No pustules were found on any oats or wheat outside the late-sown rust nursery.

VARIETY TEST: DRILLED PLOTS

WHEAT

The Early Triumph strain of Red Bobs again proved the heaviest yielder of the five wheats grown in the drilled plots, exceeding Marquis by nine and a

half bushels per acre, and ripening a day sooner. Unfortunately, it does not equal Marquis in strength of flour. In rust-infested regions it is found subject to this fungus and in farmers' hands the Red Bobs, out of which Early Triumph is a selection, is sometimes very smutty. On the Experimental Station, where grain is regularly treated for smut, this variety, like all the others, has been clean.

Red Bobs 222 is botanically indistinguishable from Early Triumph and appears very similar in all essential characteristics such as yield of grain and baking strength of the flour. At Beaverlodge, the Red Bobs 222 has been compared with other varieties only in the rod-rows. In spite of high yielding capacity, therefore, neither Early Triumph nor 222 can be unreservedly recommended, though they are sorts of considerable merit in rust-free areas.

Although Marquis has achieved an uninterrupted thirteen-year average of 36 bushels, 43 pounds, it is not quite early enough for all parts of the Peace River region at present. Too often it makes a nervous harvest. Kitchener and Renfrew are still later.



Variety plots of wheat on summer-fallow, September 7, 1927, looking east. Left to right: Reward, Garnet, Early Triumph, Marquis, Marquis, Early Triumph, Garnet, Reward. In both ranges Reward was the only variety not more or less badly lodged. Border drill scythed off ready for harvesting.

Huron lacks the quality demanded of a wheat in Western Canada.

Now that the Peace River region has won an assured place as a large-scale producer of export wheat, attention focusses upon the high-quality, early-maturing varieties. Ruby is early and usually grades well but, as the Beaverlodge Station was first to point out in 1918, it shatters far too readily. Partly because of this fact and the early cutting thereby prompted, it fails to yield so well as desired, although its ten-year average of 31 bushels 37 pounds, as compared with 38 bushels 54 pounds of Marquis, is not discreditable. The fact is that the Peace River country can make better averages with Ruby than are possible with Marquis on many parts of the lower plains.

Garnet has been welcomed as yielding more heavily than Ruby and as being less prone to shattering, although in 1927 some farmers thought the

converse held true. Yields were universally satisfactory but the grading was a little disappointing considering the good colour and nice appearance of nearly all the Garnet raised. The straw is not strong enough but in 1927 there was no very great difference in the amount of lodging exhibited by this and some other leading varieties.

Reward offers considerable promise, although ordinarily a lighter yielder than Garnet, being intermediate in production between it and Ruby. Of the five wheats in the 1927 drilled plots, Reward was the only one that stood reasonably erect at harvest.

A conspicuous fact in connection with Reward at Beaverlodge is that to date it has nearly always ripened a shade earlier than Garnet, whereas most other Stations have reported it two or three days later. The Beaverlodge estimations are supported by corroborative observations. The Reward has almost invariably emerged, headed, blossomed and ripened fully as early as Garnet alongside. To this rule there was one noticeable exception in 1927. A multiplying block of it ripened a few days later than an adjacent block of Garnet, yet in both the rod-rows and the drilled-plots, Reward was again the earlier of the two.

If the reported susceptibility of Reward to root-rot does not prove too serious a factor, it may win a large place until superseded by some other sort, possibly by one of its sister crosses.

Milling and baking tests of the 1927 crop reported by the laboratories of several Canadian milling companies rate it fully equal to Marquis in all essential respects but rather ahead of the latter in quantity of gluten. Incidentally, the Reward from Beaverlodge compared favourably with that from other Experimental Stations whose crop was represented in the tests.

WHEAT, VARIETY TEST (DRILLED PLOTS ONLY), BEAVERLODGE, 1927

Variety	Days to mature		1927			Yields of grain per acre				
	1927	Average 6 years 1922-27	Total crop	Grain lb.	Grain to total crop	Average 6 years 1922-27	Average 8 years 1920-27	Average 8 years 1920-27	Average 10 years 1918-27	Average 13 years 1915-27
Early Triumph.....	120.8	118.6	7,871	60	14	38	39	38	38	38
Garnet O. 652.....	119.3	116.6	7,350	53	23	34	44	34	34	34
Marquis O. 15.....	122.0	121.7	7,835	50	53	35	12	39	15	38
Reward O. 928.....	118.7	116.1	8,677	46	47	32	35	34	3	3
Ruby O. 623.....	117.2	115.8	6,837	42	49	30	19	32	20	31
Average five varieties.....			7,710	50	49	39.55				

MILLING AND BAKING TESTS OF WHEAT

A Comparison of spring wheat varieties grown on summer-fallow (North and South Ranges)
 Dominion Experimental Station, Beaverlodge, Alberta, Crop 1927

Mill. No.	Variety	Probable grade	Appearance	Weight per bushel		Crude protein	Flour extracted	Flour, dry	Colour, wet
				lb.	gms.				
27-184	Early Triumph	3 N	Odd bran frosted, piebald	61.2	85.13		73.1	98	98
.185	Garnet	3 N	Odd bran frosted	61.0	27.61		72.0	89	91
.186	Marquis	No. 4	Frosted, few green	60.7	31.51		72.2	98	97
.187	Reward	2 N	Odd bran frosted	63.4	32.00		73.3	97	95
.188	Ruby	1 N	Bright, plump	63.4	29.05		73.1	98	98

Mill. No.	Variety	Absorption	Loaf weight	Loaf volume	Crumb texture	Crumb colour	Remarks
27-184	Early Triumph		502	2,075	94	96	Excellent dough.
.185	Garnet	68.5	501	2,051	96	94	Dough a little short but very good.
.186	Marquis	70.7	507	2,191	96	96	Very strong dough.
.187	Reward	68.6	503	2,168	99	99	Excellent dough.
.188	Ruby	69.0	510	1,976	93	96	Excellent dough.

OATS

Twelve years' testing has reduced to five the number of varieties in the drilled plots, though thirty-two are still carried in the rod-rows.

In an eleven-year average Victory has outyielded Abundance by seven and a half bushels per acre.

Banner and Victory vie closely, the former slightly in the lead. In 1927 Banner ranked first in the drilled plots but slightly below its rival in the rod-rows, being ahead on the average of both tests for the year.

On an eight-year average Banner has been two and a half days earlier than Victory and has lodged rather less. Either is recommended in preference to Abundance, although the latter ripens a couple of days sooner than Banner and about five days ahead of Victory.

Legacy has matured two or three days in advance of Abundance, yet has outyielded it in each of the last two seasons. Its two-year average has been 115 bushels 25 pounds per acre.

While it produces a better kernel than that of Daubeney or Alaska there was an undue percentage of light ones in 1927, owing possibly to hot, dry weather shortly preceding harvest.

OATS, VARIETY TEST, 1927

Variety	Days to mature			1927		Yield of grain per acre					
	1927	Average		Total crop	Grain to total crop	Average		Average		Average	
		6 years 1922-27	8 years 1920-27			10 years 1918-27	2 years 1926-27	9 years 1919-27	10 years 1918-27	11 years 1917-27	12 years 1916-27
Abundance.....	115.5	113.6	115.1	7,758	44.42	bush. lb.	108.28	79.11	82.19	81	7
Banner, O. 49.....	115.3	114.9	116.8	8,871	45.01	bush. lb.	134.20	89.29	.....	.....	.....
Legacy, O. 678.....	110.7	110.6	.....	8,302	42.94	p. c.	115.25	.....	.....	.....	.....
Liberty, O. 480.....	114.2	111.8	113.5	7,501	34.46	bush. lb.	82.13	53.21	56.7	.....	.....
Victory.....	116.5	116.3	119.3	8,731	42.56	bush. lb.	123.4	88.6	89.16	88	23
Average 5 varieties.....	.....	.....	.....	8,233	42.04	.....	.....	.....	.....	.....	.....
Average 4 hull-retaining varieties.....	.....	.....	.....	8,416	43.73	.....	.....	.....	.....	.....	.....

OATS, COMPARING AND COMBINING YIELDS OF VARIETY TEST (DRILLED PLOTS) AND ROD-ROWS (HAND-SOWN), 1927

Variety	Variety test (drilled plots)		Rod-rows (hand-sown)		Average of two experiments	
	Yield per acre	Order of standing	Yield per acre	Order of standing	Yield per acre	Order of standing
	lb.		lb.		lb.	
Abundance.....	3,446.3	4	3,224.0	4	3,335.2	4
Banner O. 49.....	3,993.3	1	4,087.0	2	4,040.2	1
Liberty O. 480.....	2,585.2	5	2,136.0	5	2,360.6	5
Legacy O. 678.....	3,565.0	3	3,815.0	3	3,690.0	3
Victory.....	3,715.7	2	4,210.0	1	3,962.9	2
Average of 5 varieties.....	3,461.1	.....	3,494.4	.....	3,477.8	.....

BARLEY

Twenty-nine barleys were included in the rod-rows and six in the drilled plots. Charlottetown No. 80 led the field when both series were combined, with Bearer second and Gold third. In the six-year average of the drilled plots, Bearer is first, with Hannehen and Charlottetown No. 80 practically tied for second place. Eureka (beardless and hulless) was fourth and O.A.C. No. 21 fifth, with 40 bushels 1 pound. The twelve-year average for this variety was 41 bushels 19 pounds.

BARLEY—COMPARING AND COMBINING YIELDS OF VARIETY TEST (DRILLED PLOTS) AND ROD-ROWS
(HAND-SOWN)

Variety	Variety test (drilled plots)		Rod-rows (hand-sown)		Average of two experiments	
	Yield per acre	Order of standing	Yield per acre	Order of standing	Yield per acre	Order of standing
	lb.		lb.		lb.	
Bearer, O. 475.....	3,462.2	3	3,530.0	2	3,496.1	2
Charlottetown No. 80.....	3,574.8	2	3,625.0	1	3,599.9	1
Eureka.....	2,990.2	6	3,061.0	6	3,025.6	6
Gold.....	3,581.8	1	3,398.0	4	3,489.9	3
Hannchen.....	3,439.3	4	3,453.0	3	3,446.2	4
O.A.C. No. 21.....	3,149.8	5	3,278.0	5	3,213.9	5
Average six varieties.....	3,366.3	.....	3,390.8	.....	3,378.6	.....

PEAS AND TARES

The thirteen-year average performance of Arthur peas stands at 24 bushels 16 pounds. During the five years 1923-27 it yielded 34 bushels 33 pounds, while Chancellor was not far behind with 32 bushels 48 pounds, Mackay giving 37 bushels 19 pounds and tares or common vetch, 20 bushels 12 pounds.

The Chancellors were the most uniformly matured, however. It was with seed of this variety—supplied by the Beaverlodge Station in the spring of 1927, that Mr. Herman Trelle won the reserve championship at the International Hay and Grain Show.

PEAS—VARIETY TEST, 1927

Presenting 1927 data and showing comparative averages of yields over varying periods

Variety	Days to mature			1927			Yield grain per acre				
	1927	Average 4 years 1923-27 excluding 1924	Average 6 years 1921-27 excluding 1924	Average 8 years 1919-27 excluding 1924	Total crop	Grain	Grain to total crop	Average 5 years 1923-27	Average 6 years 1922-27	Average 7 years 1921-27	Average 13 years 1915-27
					lb.	bush. lb.	p. c.	bush. lb.	bush. lb.	bush. lb.	bush. lb.
Arthur, O. 18.....	125.8	126.7	126.6	128.0	5,696	42 24	44.66	34 33	32 2	31 47	24 16
Chancellor, O. 26.....	124.3	118.6	119.6	.....	5,465	40 1	43.93	32 43	29 45	31 33	.....
Mackay, O. 25.....	130.3	128.6	.....	.....	6,303	52 9	49.64	37 19	.....	.....	.....
Common vetch.....	124.0	124.5	.....	.....	4,372	33 1	45.31	20 12	17 23	.....	.....
Average three varieties peas.....	.....	.....	.....	.....	5,821	44 51	46.23	.....	.....	.....	.....

NOTE.—In 1924 the pea crop was almost a failure and was flattened by frost and snow in late September while the maturing of the late second growth was vainly awaited. Yields for that year are represented by zero in the averages. In the estimate of days to mature 1924 is altogether excluded.

FLAX AND BUCKWHEAT

The ten-year average for Premost flax, covering one or two years of failure, now stands at 13 bushels exactly. This is for crop grown not on the same season's breaking, but rather on land that had been in hoe crop or summer-fallow the previous season. Sometimes it was on land broken the preceding summer.

The three-year average for flax stands at 15 bushels 46 pounds, as compared with 30 bushels 40 pounds of buckwheat during the same number of seasons.

FLAX, BUCKWHEAT, 1927

Variety	Days to mature			1927			Yield of grain per acre	
	1927	Average 4 years 1924-27	Average 5 years 1923-27	Total crop	Grain	Grain to total crop	Average 3 years 1925-27	Average 10 years 1918-27
				lb.	bush. lb.	p.c.	bush. lb.	bush. lb.
Flax Premost.....	112	114.7	121.2	2,635	18 23	39.13	15 46	13 0
Buckwheat Common.....	102	107.0	.....	.....	25 22	.....	30 40	.....

WINTER GRAINS

Cold weather with little snow protection was hard on the winter wheat and subjected even the rye to quite an ordeal.

A line like a straight edge marked the point on the eastern slopes of the knolls above which the wheat was entirely killed, while below the dead-line, thanks to a saving powder of snow at a critical period, the crop escaped serious thinning, though possibly weakened to some extent, even there. A decade of winter-wheat trials gives Turkey Red an annual average of 26 bushels 8 pounds, as against 40 bushels 25 pounds of winter rye.

The variety-test was too badly spotted by accident of location for the yield data to possess any reliable significance.

WINTER GRAINS, 1927

Variety	Days to mature		1927			Yield per acre
	1927	Average 10 years 1918-27	Total crop	Grain	Grain to total crop	Average 10 years 1918-27
			lb.	bush. lb.	p.c.	bush. lb.
Winter wheat, Turkey Red.....	376	373.7	2,392	16 47	42.10	26 8
Winter rye, 2nd date.....	373	371.3	8,014	55 47	39.02	40 25
*Winter vetch.....	.....	.....	1,327	3 38	16.43	.....

*Badly shattered.

DATES OF SEEDING

SPRING GRAINS

Carried for the first two years with drilled plots, the date-of-seeding project was altered in 1927, when each planting of each variety was represented by six replicated plots five drills wide by 18½ feet long. Rejection of the border drills and of one foot off each end left the test areas 21 inches by one rod.

The land was twice ploughed summer-fallow, and had been used as a hog pasture in 1925. Growth was excessively rank, and a sorry mess of lodging resulted. The Banner oats were partially flattened before they headed and by harvest the only erect crop in the lay-out was the O.A.C. No. 3 oats. All the others represented degrees of lodging ranging from partial to very bad.

Foxtail volunteering from an adjacent fence bottom considerably choked some of the wheat and was not completely controlled by hoeing.

Lodging in these and others of the eight thousand rod rows to be harvested by hand so delayed the work in gathering that many of the plots were not cut when they should have been. Added to this is the fact that maturity was abnormally irregular, all five dates of the earliest oats, for instance, ripening within a few days of each other, while the maturing dates of Eureka barley were only a little less closely bunched. This was attributed to a hot period of rapid-ripening weather that occurred in August.

What, then, with lodging, abnormal maturity and delayed harvesting, the 1927 test was rather badly spoiled and is not to be regarded as trustworthy in its indications.

It is remarkable to find that in spite of lodging the first sowings of Marquis wheat yielded 72 bushels 52 pounds per acre, and of Garnet (on poorer soil) 55 bushels 19 pounds, of Banner Oats 134 bushels, of Liberty (hullless) 94 bushels 5 pounds, of Eureka (hullless) barley 77 bushels 31 pounds, and of Premost flax 23 bushels 3 pounds.

While there is some irregularity in the results, it is worthy of note that in every case but one the first sowing produced the largest yield. The one slight exception was in Garnet wheat, where the third sowing surpassed the first by 34 pounds per acre, the second, strange to say, being considerably lower than either.

Considering all the handicaps, it is satisfactory that the results are as consistent as they are. It is not surprising that in a late-opening season early seeding should have proven advantageous.

THICKNESS-OF-SEEDING OF CEREALS

This project with spring grains was conducted as before, and on the same land as in 1925, the two varieties of each kind of grain being, however, in converse position.

In 1926 the land grew a short crop of corn, which had been drilled in on the cultivated stubble as a summer-fallow substitute. The corn was flattened by frost and snow and was not harvested. In the spring of 1927 the leaves and soft stalks were disked into a rather soggy and scantily prepared seed bed.

The plots were drilled seven feet wide and trimmed at harvest to five feet, giving an area of one fifty-second acre.

WHEAT

The wheats used were Marquis O-15, of the 1925 crop, and 1926 Garnet. The latter possessed only 81 per cent germination, hence an allowance of 20 per cent was made in setting the drill. From weights of seed taken before and after sowing, it is deduced that both varieties were applied about fifty per cent more heavily than was intended. The dry, copper-carbonated seed evidently fed much faster than the index lever indicated. It is probable, however, that both varieties had about equivalent applications of viable seed.

The Garnet this year occupied the higher ground, and perhaps from this cause averaged four and a half bushels less than the Marquis.

Presumably as a result of excessively free feeding through the drill, the lowest rate of seeding gave the best yield of the Garnet, the thickest seeding producing the least. In 1926, when wireworms were troublesome, experience to the contrary was marked, notwithstanding the dry weather then, which might have been expected to favour a thin seeding.

With the Marquis in 1927, yields of the various seedings were remarkably even.

Combining data from the two varieties, there seems a distinct tendency to reduction of yield as the rate of seeding increases, but this influence, in so far as the 1927 crop is concerned, is exhibited solely by the Garnet.

With both varieties the nominal five-peck seeding must have been actually nearer 105 pounds of viable seed, the amount usually sown in the variety tests.

The oats also fed too fast. As nearly as can be estimated from seed weights they were put on at least thirty per cent too thickly.

The outcome is less consistent than usual, particularly in the case of Banner, which gave its highest yields from the extreme seedings, with the intermediates five or six bushels less. Almost precisely the opposite issue occurred with the Ligowo. Harvesting conditions were such that a little more than the usual degree of experimental error was to be expected. It is noteworthy that in the fourteen-peck seeding of Banner, one plot yielded more than nine bushels per acre in excess of its duplicate.

Thick seedings were not observed to ripen ahead of thin ones in 1927. There was, though, a tendency for the straw to diminish in height as the rate of sowing was increased. As usual, this was more marked with Banner than with Ligowo.

As a whole, the Banner again outyielded the Ligowo, the difference amounting to 346 pounds of bundles and nearly eight bushels of grain per acre.

BARLEY

In the sowing of the barleys the aim was to apply about ten per cent less weight of the Eureka than of the Bearer, in order to allow for the absence of hull on the Eureka. From post-seeding calculations it would appear that this relativity must have been substantially maintained, but that both varieties were sown about forty per cent more heavily than intended, even after allowing for a certain deficiency in germination.

As in the other grains, results were none too consistent, but the largest yield of Eureka was from the heaviest seeding and the lightest yield from the smallest seeding. There was a slight tendency for the straw to shorten as the seeding thickened.

The heaviest yield of Bearer was from the second-thickest sowing. The straw of the two heaviest seedings of this variety was four inches shorter than the straw of the thinnest sowing.

Both barleys lodged badly. In this respect no discernible difference could be attributed to the rates of seeding.

The Eureka looked unpromising for some time after its emergence but finally yielded 53 bushels 40 pounds, as against 67 bushels 23 pounds of Bearer. If from the yield of the latter we deduct ten per cent for hull, its net yield of *meat* is found to be less than thirteen per cent in excess of the beardless-hulless Eureka. The Eureka is earlier and in this experiment did not lodge much worse than the other. It was the nicer of the two to harvest.

HYBRIDIZATION TEST

Five-row plots of each row grown in the parent 1926 tests failed to reveal conclusive evidence of the amount and distance at which natural crossing may take place between varieties in the plots. Pure seed from the parent Marquis and Huron was sown as checks and produced no conspicuously off-type heads. Regarding the Marquis and Huron the results indicate that natural crossing does occur even at some distance but the lack of uniformity in the results does not permit close-scrutiny deductions. Doubtless weather conditions at blossoming affect the matter.

The diversity of type in the Garnet made it impossible to determine the amount of crossing exactly. Bearer and Eureka showed practically no evidence. The oats were not studied in detail.

FORAGE CROPS

Cold weather when there was very little snow on the ground had caused more than the usual amount of dormant-season injury to perennials. Of the 1926 seedlings, all the small clovers were completely killed, whilst both new and old stands of alfalfa suffered more or less extensively wherever deprived of a good top to catch the light powder of snow that occurred in early winter. Vigorous stands protected with a generous top, or with a binder stubble as in the case of plots cut for seed, came through without much injury. Sweet clover, for once, appeared to endure the winter ordeal better than alfalfa. This is contrary to previous experience at Beaverlodge.

The better-adapted species of grasses evinced no impairment of their stands, but some of the least hardy were more or less completely killed out. Western rye, brome, and timothy were not scotched, but perennial rye was almost exterminated, while orchard grass fared little better. Meadow fescue was severely injured and Kentucky blue presented a very ragged stand, though whether from winter-killing or other causes is not precisely known.

Thanks to abundant moisture, all hay plants that survived the winter in good heart made a luxuriant growth, and yields were heavy. This was particularly true of brome grass. It seemed to be a brome-grass and sweet-clover year. Responding to the moisture, timothy did much better than usual but is little grown in the district. Western rye, although taking second place this year to brome, yielded satisfactorily.

Even in this favourable hay year, however, the perennial crops were again outyielded by the annuals, but the difference was less than usual and from the standpoint of economy the odds probably favoured the meadow crops as compared with cereal hays, for there is a big economy in the crop that does not require annual preparation, providing it yields moderately well. Fertility is doubtless conserved, and certainly erosion is checked by clothing land with hay and pasture crops, while the advantage to live stock of supplementing the customary cereal roughage with grass and legume hay is undeniable, so that meadow crops claim a place in our agriculture, although cereals will take the lead.

Sunflowers grew well, but are going out of favour as a crop. Corn reacted indifferently to the cool, wet, early summer. Those turnip varieties of which the seed proved good yielded more abundantly than usual and the same might be said of rape and kale. Mangels germinated satisfactorily but most of the seedlings were expeditiously destroyed by an insect which also wrought havoc among the beets until poison spray was applied. The mangel stands were consequently too ragged to permit of trustworthy variety comparisons. The general result with field roots went to emphasize that Grande Prairie is ill-adapted to the commercial culture of this class of crop, although under garden

conditions and occasionally in field practice some good yields can be obtained. For the most part, Beaverlodge is quite willing to yield the palm to Fort Vermilion in the production of these particular esculents. Turnips are far the best-adapted class of roots for general use, though a few mangels or sugar beets may be very profitably grown adjacent to the hog corrall or the cow stable to be used for fall consumption, and a few in the cellar are not amiss for spring feeding.

CROPPING TEST WITH ALFALFA

It having been reported from various sources that alfalfa could be weakened by too frequent mowing and also that its stands retained greater vigour if not cut until the full-bloom stage, it was decided in 1925 to undertake an experiment along this line.

A strip 3 by 58 rods had been seeded to alfalfa in June, 1923, at twelve pounds per acre. An excellent stand was obtained, though for some reason the growth was never equal to that produced by alfalfa elsewhere on the Station.

Certain old cross paths transversed the area. Elimination of these and of certain areas where comparisons were spoiled by grass coming into one plot as a result of prior cropping, left ten areas from which satisfactory data were obtained:—

- (a) Two plots were cut each year in early bloom and the aftermath also cut.
- (b) Two plots were cut each year in early bloom but their aftermath left standing.
- (c) Two plots were cut each year in full bloom and the aftermath also cut.
- (d) Two plots were cut each year in full bloom but their aftermath left standing.
- (e) Two plots were cut annually for seed.

Though the land was fairly even in its aspect there had been a marked variation in the 1925 saturation from spring run-off, and duplication may not have avoided some substantial amount of experimental error. In this connection it is noteworthy that in 1925 the average yields of six plots cut only once exceeded the average first-cutting yields of the corresponding six plots from which the aftermath was later removed. Slight contour irregularities affect the yields of perennials much more markedly than they affect annuals.

In the taking of yields each plot was first trimmed with a mower to about 30 feet by 60 feet. The standing area was then carefully measured and its size precisely determined. It was then cut; green weights were taken; dry-matter determinations were made and yields were calculated in terms of hay carrying 88 per cent dry matter. This is the practice now followed at Beaverlodge with all hay plots, only that yields are usually taken from one or two full mower swaths cut out of the heart of a plot. The swath being of constant width, considerable trouble in measuring and calculation is avoided.

Down to the end of 1926 the cropping results seemed to favour taking two cuttings per annum and cutting in the full-bloom rather than the early-bloom stage. Experimental error may have entered to some extent, however. In 1927 the evidence was emphatically reversed. Every plot that had been cut twice was slow in starting and showed more or less extensive winter-killing, especially in its centre, remote from the protecting influence of the marginal fringe of tall growth. Weeds grew in these winter-killed patches and had to be laboriously hand-pulled at haying to avoid exaggeration of the yields.

The yield data of three years' cropping is summarized: On the plots supposed to be cut twice in late bloom the 1927 aftermath was so short and ragged that no yield was obtained. The drift of the experiment seems to raise the question whether it were not, on the whole, better to be content with one cutting per annum.

THREE SEASONS' CROPPING TEST WITH ALFALFA

Designation	Yield cured hay per acre												Average three years
	1925			1926			1927			Total	Aggregate three years		
	First cutting	After-math	Total	First cutting	After-math	Total	First cutting	After-math	Total				
Cut once in early bloom, Range 1	1,431	1,431-0	1,460-0	1,460-0	1,460-0	2,311-0	2,311-0	2,311-0	5,202-0	1,734-0			
" " Range 2	2,001	2,001-0	2,039-0	2,039-0	2,039-0	3,560-0	3,560-0	3,560-0	7,600-0	2,533-3			
" " average 2 ranges	1,716	1,716-0	1,749-5	1,749-5	1,749-5	2,935-5	2,935-5	2,935-5	6,401-0	2,133-7			
Cut twice in early bloom, Range 1	1,545	960-0	1,805-0	1,406-0	1,358-0	1,752-0	995-0	2,747-0	7,316-0	2,438-7			
" " Range 2	1,783	1,008-0	2,791-0	1,608-0	1,597-0	1,772-0	1,230-0	3,002-0	8,998-0	2,999-3			
" " average 2 ranges	1,664	634-0	2,298-0	1,507-0	1,477-5	1,762-0	1,112-5	2,874-5	8,157-0	2,719-0			
Cut once in full bloom, Range 1	1,311	1,311-0	1,311-0	2,508-0	2,508-0	2,054-0	2,054-0	2,054-0	5,873-0	1,957-7			
" " Range 2	1,703	1,703-0	2,899-0	2,899-0	2,899-0	3,446-0	3,446-0	3,446-0	8,043-0	2,682-7			
" " average 2 ranges	1,507	1,507-0	2,703-5	2,703-5	2,703-5	2,750-0	2,750-0	2,750-0	6,960-5	2,320-2			
Cut twice in full bloom, Range 1	1,575	1,010-0	2,585-0	2,746-0	497-0	3,243-0	3,243-0	3,243-0	7,973-0	2,657-7			
" " Range 2	2,787	1,277-0	4,064-0	3,243-0	1,450-0	1,991-0	1,991-0	1,991-0	10,743-0	3,582-7			
" " average 2 ranges	2,181	1,143-5	3,324-5	2,994-5	973-5	3,968-0	3,968-0	3,968-0	9,360-5	3,120-2			
Cut once for seed													

ORCHARD GRASS, OTHER GRASSES, AND LEGUMES

On a dry, clay knoll two plots of orchard grass (*Dactylis glomerata*) were seeded in 1923. Two plots each of timothy and Western rye were seeded for comparison with it.

The table of four years' yields makes out a sorry case for *Dactylis*. It proved even a poorer drought resister than timothy and also less winter-hardy. This latter point was still more clearly revealed by the results of subsequent seedings. The 1926 seeding, for instance, had only a five-per-cent stand in 1927. The orchard grass seeded in 1923 yielded nothing at all in 1925 and a four-year average of only a little over half a ton per acre against three-quarters of a ton for timothy and 1,925 pounds for Western rye.

Incidentally, the experiment afforded an instructive comparison between the latter two. In the abnormal season of 1924, when blisteringly dry weather until mid-summer was followed by weeks of soaking rain, each yielded an aftermath. Grasshoppers seemed to affect the 1925 yield of Western rye quite severely, and the 1926 yield to some extent, but in 1927, helped out by volunteer alfalfa, it nearly doubled the timothy yield and in the average of the four seasons out-yielded the latter by twenty-one per cent.

ALL THREE GRASSES FAR OUTYIELDED BY LEGUMES

Eloquent of the advantage of legumes is a comparison of these three grasses with certain adjacent plots of alfalfa and sweet clover. The former was seeded in 1922 and cut annually for seed until 1927, when a crop of hay was taken, preliminary to breaking up. Although a year older than the grass stands and occupying much the same type of soil—perhaps a little more favourable—they yielded from the one cutting 4,854 pounds of hay, against 1,377 for rye grass, 724 for timothy and 121 for orchard grass. At that, the yields of rye grass and timothy had clearly been augmented by some alfalfa volunteering among them.

Flanking the grasses were some self-seeded plots of both White- and Yellow-blossomed sweet clover, being the second volunteer crop from seed scattered in 1924, when a seed crop was harvested. The crops were very thick and fine, but on this white-clay knoll the yellow-blossomed was rather short. It yielded only 2,636 pounds of hay per acre and the white-blossomed 6,453 pounds. It is, of course, unfair in a way to compare the yield of a biennial crop with the fourth-season yield of a perennial, but the contrast is still suggestive, and the yield of sweet clover very good indeed considering the adverse soil conditions under which it was grown.

As between alfalfa and the grasses the contrast was direct and conclusive. When a fifth-year crop of alfalfa yields from one cutting three and a half times as much as a fourth-year crop of Western rye grass, adjacently situated, there is evidence of first-rate importance. It emphasizes previous findings that while the grasses may equal alfalfa in yield for the first year or two of a given lay, the longer the stands remain the better the relative showing of alfalfa, providing it is not winter-killed or choked with weeds.

ORCHARD GRASS VERSUS TIMOTHY AND WESTERN RYE GRASS

Variety	Yield cured hay per acre					
	1924	1925	1926	1927	Aggregate 4 years	Average 4 years
	lb.	lb.	lb.	lb.	lb.	lb.
Western rye grass.....	2,920	670	2,735	1,377	7,702	1,925.5
Timothy.....	1,770	1,054	2,808	724	6,356	1,589.0
Orchard grass.....	1,757	.....	2,302	121	4,180	1,045.0

PASTURING TEST IN SEEDING DOWN

Three successive annual seedings have now been made of the experiment laid down in 1925 to try out the plan of pasturing new stands of meadow crops during their initial season in order to keep annual weeds from seeding while the hay plants are establishing themselves. It were premature to publish results at present, but the records are set down to be carried forward until the test will have run a sufficient length of time to warrant deductions. The experiment was conducted as reviewed under this head in the 1926 report.

The crop in 1926 was fairly free of weeds. That of 1927 was pretty clean, in some cases, but certain ones were interspersed with a considerable weed growth. In retrospect, it now seems quite clear that these weeds ought to have been removed before yields were taken, but the original plan of experiment had not contemplated this necessity, and in the absence of the superintendent at Ottawa during the haying season it was not done. A rough estimate of the weed growth in the worst-polluted plots was made but it was only approximate, hence no accurate deductions could be made on this score. The 1927 yields, therefore, include, in some instances, a considerable percentage of weed growth.

ALFALFA VARIETY TESTS

An experiment to compare alfalfa varieties and strains was seeded in 1918 but lack of inoculation resulted in a ragged crop and very indecisive data. Further seedings have been made in 1923, 1926, and 1927.

THE 1923 SEEDING

This test was seeded in 1923 on a dry, grey-clay knoll fronting the highway, about as unfavourable a spot for forage crops as could be found on the farm. The 1924 crop was left for seed, the yield of which would have been good if not spoiled by wet weather while in coil. Since then the plots have been cut once annually for hay, the aftermath always being left standing to hold snow. Owing doubtless to this fact the stands are still intact, whereas an adjacent area on better land from which two very fair cuttings per annum were obtained, sustained winter injury and was ploughed up. The plots are in duplicate and so arranged as to check up pretty well on soil variation.

A surprising feature is the showing of the Yellow-flowered Siberian. It is a short-stemmed variety with a low-set crown, and during the first two cropping seasons its production seemed much less than that of the Grimm. During the past two years, however, it has decidedly outyielded its competitor. It still grows a shorter and finer stalk than it but makes up for this by the thickness of its stand. In 1926 samples for chemical analysis were sent to Ottawa. The results were not available for the 1926 report but have since been reported as follows by the Dominion chemist, Dr. Frank T. Shutt:—

ANALYSIS OF ALFALFA HAYS, 1926 CROP

Variety	Yellow-flowered Siberian	Cossack	Grimm
	p. c.	p. c.	p. c.
Moisture.....	12.00	12.00	12.00
Protein.....	15.87	16.12	16.03
Ether extract.....	3.90	4.13	4.23
Carbohydrates.....	36.45	37.58	38.06
Fibre.....	25.08	22.61	21.22
Ash.....	6.90	7.56	8.46
	100.00	100.00	100.00
Albuminoids.....	13.32	14.82	13.53
Non-albuminoids.....	21.35	1.30	2.50

"No marked difference between these hays is to be observed—though certain of the results would indicate that the yellow-flowered Siberian is somewhat the riper and slightly less nutritive than the other two varieties. For practical purposes, however, they may be considered, in respect to composition, of equal feeding value.

"These data, as a whole, are in fair accord with those of alfalfa hay of good quality."

A local rabbit breeder was asked to test these hays from the standpoint of palatability. He reported that his Chinchillas manifested a distinct preference for the Yellow-flowered Siberian, possibly on account of its fineness.

No analyses were made of the 1927 crop.

THE 1927 SEEDING

The 1927 seeding was made in duplicate plots about ten rods long by seven feet wide, the seed being scattered from the grass-seeder attachment of a 14-run grain drill and covered by the disks of this implement driven on eight-foot centres. The north range (with the probable exception of Ontario Variegated and Grimm varieties) was on land which grew flax plots in 1926. The south range was on pea stubble, on to which the first range slightly lapped. The pea stubble had been prepared by spring-tothing on May 4. The flax stubble was disked May 23-25.

The land was smoothed and finally seeded on June 7. The Grimm and Ontario Variegated were put on at ten pounds per acre, but owing to shortage of seed the other varieties were sown at nine pounds.

Considerable volunteer flax and quite a quantity of weeds grew on the flax stubble. The pea stubble was cleaner. The latter area was hand-weeded, as were three or four plots on the south edge of the flax-stubble area.

ALFALFA FOR SEED PRODUCTION

The set of alfalfa seed was better than in 1926 but only a small proportion of it ripened. With another fortnight free of severe frost the seed crop would have been heavy. It is surmised that the fore part of the summer was too wet for a good set on the early blooms.

The two rows seeded in 1923 with home-grown seed and estimated as drawing from an area of 0.28 acre, yielded a crop which according to the threshing records would have amounted to a very nice yield indeed. There is just a possibility, however, that this yield was confused with that of four other rows seeded in 1926, and for this reason yields of the two rows cannot be given. The six rows yielded approximately two bushels per acre, grading No. 3 at Calgary, because of containing some brown and shrunken seed.

The broadcast half acre seeded in 1923 threshed out at the rate of 56 pounds of seed per acre.

ROWS VERSUS BROADCAST FOR SEED

In addition to the above-mentioned comparison a project was begun in 1925 to try out inter-cultivated rows with broadcast stands for seed. Crinkling interfered with cultivation of the rows in 1926 and neither system of culture produced much seed that year anyway.

In 1927 cultivation of the rows was for other reasons rather inadequately attended to until the growth was too spreading to permit further passage of the scuffler.

BROADCAST ANNUAL CROPS FOR HAY OR ENSILAGE

THE O.P.V. TEST

Banner oats, Chancellor peas, and common vetches were employed this time in the O.P.V. experiment, which was duplicated on each of three preparations, being really a sextuplicate test.

Intended rates of sowing were:—

Oats only at 10 pecks per acre.

Oats and peas at 5 pecks of each per acre.

Oats and vetches at 5 pecks and 30 pounds respectively.

O.P.V. at 5 pecks, 3 pecks, and 20 pounds respectively.

In sowing the legume seed in the one plot of the O.P.V. mixture the index lever was accidentally left loose on one side of the drill. Otherwise, it appeared as though the drill applied about the prescribed rates throughout the series.

On one range of the oat-legume mixture plots, the requisite complement of oats was drilled immediately the peas and vetches were seeded. On the other range the oats in the mixed plots were not drilled until eighteen days later, May 30. The rest of the test had been sown on May 12.

The three different preparations represented were: corn ground, sunflower stubble, and summer-fallow. The 1926 crop of corn had been short and covered with snow ere it could be harvested. The oat and oat-legume plots were drilled 7 feet wide on 8-foot centres and trimmed at harvest to 5 feet by removal of border drills.

Growth was rank and much lodging occurred, especially on the summer-fallow course. It was extremely difficult to separate the border drills and quite impossible to make a clean cut with the binder. On the fallow plots the stubble was about six inches longer than normal. None of the stubble was scythed except where heads had escaped the binder. Under the circumstances, interpretation is easy since much may be conveniently attributed to experimental error.

Comparing first the four crops, it may be seen that once again oats out-yielded any of the oats-legume mixtures. This has been the unvarying result since the test was initiated in 1918. Averaging the 1927 oat yield against that of the oat-legume combinations, the figures are 8,867:6,636—a difference of 33.6 per cent. This is greater than usual but something may be allowed for the more serious lodging of the legume-mixture plots.

Eighteen days proved too long a head start to allow the peas and vetches over the oats; for the latter were dwarfed thereby; and taking the average of all three mixtures the aggregate yield was more than a ton less per acre than from the range where the oats were drilled immediately after the peas and vetches. The percentage loss through deferred drilling was thirty per cent.

Comparing the three preparations, we find that the summer-fallow yielded 7,826 pounds per acre, corn ground 7,649, and sunflower stubble 6,106. The sunflower plots were more completely harvested than the others, having lodged less.

CEREALS FOR HAY

Beside the O.P.V. experiment, under the same conditions of preparation, and with the same degree of duplication, was seeded the 1927 test of oats, wheat, and beardless barleys for hay. The only exception to the similarity of treatment was the Ruby wheat, of which but one strip was sown, against two each of the other crops, but as the wheat was intermediate in position the test was believed to be fairly representative. The soil was in good tilth, having been spring-toothed some time in advance of seeding. Plots were drilled 7 feet wide on 8-foot centres and trimmed at harvest to a width of 5 feet.

Intended rates of seeding were:—

- Banner oats at 10 pecks per acre.
- Fenil (hulless) barley at 8 pecks per acre.
- Alberta Beardless barley at 10 pecks per acre.
- Eureka (hulless) seed inferior at 8 pecks per acre.
- Ruby wheat at 7 pecks per acre.

The plots were all cut August 23 when the crops were sufficiently mature to make seed although not ripe enough to give a full yield of grain. The Fenil and the Alberta Beardless barleys were very flat in the summer-fallow range, the latter being particularly lodged and tangled so that the binder left a long stubble on the fallow plots. All the plots were gleaned for heads missed by the binder but no stubble was scythed except what had heads attached. Yields are thus considerably less than they would have been if the crops had been cut with a mower.

Once again Banner oats exceed any of the other crops in yield, followed by Ruby wheat. Alberta Beardless barley, which was second only to the oats in 1926, is this year lowest of the five cereal hays, the change of position being probably due to lodging.

YIELDS OF CEREALS IN TEST CEREALS FOR HAY 1927—AVERAGE OF DUPLICATE PLOTS

Designation	After corn	After sunflowers	After summer- fallow	Average three preparations
	lb.	lb.	lb.	lb.
Banner oats.....	8,413.5	7,614.5	6,764.5	7,597
Fenil barley (hulless).....	6,576.0	6,420.5	7,082.5	6,693
Alberta beardless barley.....	4,453.0	4,924.0	5,322.0	4,899
Eureka barley (hulless).....	5,862.5	4,835.5	7,598.5	6,098
Ruby.....	6,051.0	6,417.0	8,255.0	6,907

INTERCULTIVATED CROPS

SUNFLOWERS

Four varieties of sunflowers were drilled May 23 in sextuplicate on summer-fallowed land, in good tilth, with ample moisture. Growth was satisfactory but a warning touch of frost prompted harvesting on September 15 and 16. No appreciable frost injury had yet occurred.

As in previous years there has seemed to be little or no consistent relationship between stage of maturity and percentage of dry matter. The Mennonites this time, with one hundred per cent in bloom, show the lowest dry-matter ratio, while the Mammoth Russians, which had only one per cent of bloom, carry the highest dry-matter percentage. If something on this order had not occurred so often before one would be tempted to think that one kind had been wilted more than another, but the method of harvesting and weighing in 1927 left slight chance of such a discrepancy on the average of all replications.

CORN

Eleven varieties and strains of corn were drilled May 21. Most of the land had been ploughed out of sod plots on July 26 and 27, 1926, but one of the six replications and part of another extended to land that had been summer-fallowed or otherwise treated. For some reason growth was better on the sod area, though nowhere good. Excessive moisture in the early summer probably kept the ground too cold. Seed of Twitchell Pride proved very inferior and its stand at harvest was but three per cent. None of the stands were good.

The 1927 performance of the corn crop does not warrant any lavish levy on the King's Printer's ink supply.

RAPE AND KALE

Two rapes and five kales were sown in drills May 23 on rich, moist, summer-fallowed land. The area available did not permit duplication.

Improved 1,000-headed kale manifested no "improvement" in regard to seed viability for only the label stakes denoted a row at harvest. The Dwarf Essex rape was no better and the Purple Marrow-stemmed kale had only 15 per cent of a stand. It is possible, of course, that some other factor than defective germination was responsible, but the test was certainly ragged and disappointing from first to last, although the plants which occurred made a good growth. Giant rape produced thirty and a quarter tons of green weight and over four tons of dry matter per acre. Some discount should be allowed for the fact that it was flanked by a vacancy.

Exclusive of the two varieties that failed outright, the remaining five average fifteen tons of green weight per acre and 4,198 pounds absolute dry matter, the percentage of solids being 13.9.

FIELD ROOTS

The field root association was seeded May 20 and 21 on a rich piece of summer-fallowed land well stored with moisture and soluble plant food. This ought to have awakened the gratitude of the clans, but only the Swedes evinced much reciprocating sentiment.

Of the four turnips Purple Top Mammoth was afflicted with poor seed, achieving only a third of a stand, and its roots were soft and mushy, not to say putrid—although some were. Ditmar's distinguished itself with a yield of twenty-six tons, but its percentage of solids was low and its yield of dry matter scarcely equal to that of the Bangholms. The test was in duplicate. The crop was lifted October 22.

The mangels sustained a high infantile mortality from parasitism. Germination was fairly good, and the swine in the adjacent corral were commencing to lick their chops in anticipation of winter succulence when an insect to whose acquaintance no one pretended began to decimate the mangel crops so persistently that in the end there was but a decimal of a stand left. The offices of the gardener with his knapsack sprayer were invoked, but in time to preserve only a small remnant. These responded with a degree of individual expansion that made up in part for the riddled ranks. The specimens were sizable when lifted in mid-October (15), but the yield of dry matter per acre of the two varieties determined was only a little over two-fifths that of the four turnips. The yield of the two was taken only to preserve the chronology of mangel-wurzel performance. Variety evaluations were vain.

The sugar-beet clan was not doubled. It occupied a remnant of area abutting the field carrots. Some of the seed did not seem good and conditions varied also with position. In production of dry matter per acre the sugar beets this

year wrested the booby prize from the carrots, although this was owing more to extra poor stands of the beets than to any assimilative superiority of the carrot aggregation.

One of the carrots amassed ten tons of green weight, containing a ton and a quarter of dry matter per acre. It is doubtful whether the field will recover for some years from this abstraction of fertility.

NOVELTIES

Four varieties of corn were received from Herman Trelle some time after the variety test was sown. Although it was too late to get conclusive results the seed was nevertheless planted and the relative behaviour of the varieties noted. These varieties are supposed to be the earliest under test at the present time. None reached a height of more than forty inches. The Ruthenian Flint and King Flint proved to be later than Howes Alberta Flint. Trelle's corn produced about five cobs per plant which reached the milk stage. This variety appears to be considerably earlier than the rest.

Seed of *Phacelia tenacetifolia*, a honey-producing plant, was received from Hungary and sown in 1927 in the novelty area. The plants reached a height of about fifteen inches and bloomed freely. Bumble bees worked the row freely and were assisted occasionally by a few Italians. This plant may be a honey producer but it can never compete with sweet clover since it seems to lack value as a forage crop.

DRY-MATTER COMPARISONS OF ANNUAL FORAGE CROPS

Although not absolutely fair, the table comparing yields of various annual forage crops in pounds of dry matter produced per acre is highly suggestive, especially as the percentage rating agrees rather substantially with that of 1926.

In each year the first four positions are held by the cereal crops and combinations thereof, with oats leading. In each year sunflowers stand fifth, with turnips, rape and kale, and millets occupying the next three places. Mangels, carrots, sugar beets, and corn are each year in the last four positions, though ranking variously among themselves.

It is true that defective stands have played a part with certain of these crops; but on the other hand it should not be overlooked that the crops at the head of the list had, on the average, the least favourable preparation. It seems clear that for years to come Peace River farmers will be justified in continuing their present practice of relying upon cereals as the basis of their live stock rations, with other forage crops as supplementals.

COMPARING THE DRY-MATTER CONTENT OF VARIOUS FORAGE CROPS AS GROWN AT BEAVERLODGE, 1927

	Preparation for 1927 crop	Number of plots involved in 1927	Yield	Percent-	Rating
			absolute dry matter per acre	age comparison with oats as 100 p.c.	in 1926 (various preparations)
			lb.	p.c.	
Banner oats.....	One-third fallow; one-third corn ground; and one-third sunflower stubble.	12	8,232	100	100.0
Ruby wheat.....	" " "	3	6,907	84	80.5
Oats and legumes.....	" " "	18	6,635	81	84.2
Bald barley.....	" " "	18	5,896	72	80.5
Sunflowers.....	Summer-fallow.....	24	5,187	63	76.3
Turnips.....	" " ".....	8	4,902	60	43.0
Rape and kale.....	" " ".....	5	4,198	51	58.9
Millets.....	Potato ground.....	20	3,138	38	56.3
Mangels.....	Summer-fallow.....	4	2,092	25	21.1
Carrots.....	" " ".....	3	1,756	21	7.3
Sugar beets.....	" " ".....	4	1,338	16	25.7
Corn.....	Mostly sod ploughed in late July.	66	930	11	21.9

HORTICULTURE

The season of 1927 followed a winter which proved severe on vegetation wintering over. Many ornamental and fruit trees such as Manitoba maples, plums, and sandcherries were more or less frozen back. Roses were killed outright. Hollyhocks, though well mulched, were with one exception destroyed.

There was no damage by early frosts but the spring was wet and it continued so into the summer. In consequence some vegetables gave better results than usual. But as the wet weather continued much of the ground became soggy and when the dry weather ensued the necessary mellowness was difficult to regain. From this cause tomatoes, celery and the annual flowers suffered most.

The first hotbed was sown on April 26. Work began on the land May 4. The hotbeds were in fine condition all season.

Much credit is due the gardener, Mr. P. Flint, from whose careful notes this section of the report has been compiled.

VEGETABLES

ARTICHOKES.—The Jerusalem variety made the usual vigorous growth from old tubers in the ground. Burbank's artichokes, Giant Crimson and Burbank's Perpetual were sown somewhat late, and though producing handsome foliage, did not bloom.

ASPARAGUS.—The older planting supplied the table more abundantly than in previous years. Palmetto, Giant Washington, and Giant Argenteuil sown in 1926 came through the winter safely. Fine seedlings of each variety were transplanted to form a new bed.

BEANS.—Fourteen varieties or strains, sown on May 26, produced probably the greatest yield of green beans harvested to date. Yet some of these failed to make perfect stands. The first used were from Masterpiece and Bountiful on August 5. Some later varieties (from which little result is usually obtained) on account of good moisture and favourable weather came to the fore. Thus Refugee as well as Bountiful has a good lead over Masterpiece, a record yielder. Davis White Wax, formerly one of the foremost, is far down the list.

Broad beans and Pole beans also gave satisfactory results. Of the latter, Gold King (Webb) plants were 4 feet high, bearing abundantly. Scarlet Runners (Sutton) reached 5 and 6 feet with pods a foot in length.

BEETS.—The sowing of beets on May 14 comprised fourteen varieties. The early growth was threatened with destruction by insects. This was averted by a treatment of arsenate of lead. The beets were taken up on September 15, presenting a fine yield of symmetrical form.

YIELD OF DIFFERENT VARIETIES OF BEETS

Variety	Source	Yield per acre	
		tons	lb.
Crosby Egyptian.....	Steele-Briggs.....	17	1,000
Early Flat Egyptian.....	Moore.....	16	1,750
Detroit Dark Red.....	McDonald.....	16	625
Early Wonder.....	Ewing.....	15	1,750
Extra Early.....	McKenzie.....	15	1,375
Detroit Turnip.....	Graham.....	15	1,125
Early Model.....	Bruce.....	15	1,000
Detroit Dark Red.....	Moore.....	14	1,875
Eclipse.....	McDonald.....	14	250
Cardinal Globe.....	Rennie.....	13	1,750
Detroit Dark Red.....	10468.....	12	1,625
Early Model.....	Graham.....	12	1,250
Black Red Ball.....	O-8694.....	7	250
Improved Dark Red.....	Webb.....	4	0

Improved Dark Red, a long beet, new at this Station, made a poor showing. With this exception any of the above varieties may be freely recommended.

BORECOLE OR KALE.—The plants were of the usual excellence in growth and quality. Two varieties were planted, Tall Scotch Curled and Dwarf Curled. The latter, a handsome plant with dark-green crinkled foliage spreading over four feet, was used for ornamental purposes.

BRUSSELS SPROUTS.—A quantity sown early, April 26, and transplanted May 19, produced comparatively few mature sprouts. The head was nipped from some, while the leaves were stripped from others, but no advantage was observable over those not so treated. In the variety test the Dalkeith (McDonald) had the largest number of mature heads, 43 per cent of the whole number planted, while Improved Dwarf (Vaughan), had only 20 per cent, Amager Market (Ewing) 13 per cent, and Paris Market (Ewing) 10 per cent.

CABBAGE.—Nineteen varieties, sown in the hotbed May 9, and transplanted to the open June 14, produced good, sound heads of each variety except Kinver Globe Savoy. Some injury was caused by root maggots but two applications of corrosive sublimate reduced it to a minimum. The insects identified in 1926 as the larval stage of the anthomyid flies were again considerably in evidence, eating around the heart and up between the leaves of the early varieties particularly. They resemble the root maggots turned brown.

YIELD OF DIFFERENT VARIETIES OF CABBAGE

Variety	Source	Yield per acre	
		tons	lb.
Dala.....	McDonald.....	32	1,098
Succession.....	Ewing.....	23	766
Early Paris Market.....	McDonald.....	22	830
Danish Summer Ballhead.....	Harris.....	22	165
Enkhuizen Glory.....	Rennie.....	21	1,711
Copenhagen Market.....	Madsen.....	21	1,681
Flat Swedish.....	D. & F.....	21	1,343
Copenhagen Market.....	Graham.....	20	716
Brunswick Short Stem.....	Madsen.....	17	485
Brandon Market.....	McKenzie.....	17	81
Golden Acre.....	Madsen.....	16	549
Golden Acre.....	Harris.....	15	1,520
Extra Amager Ballhead.....	O-8939.....	13	257
Early Winningstadt.....	Madsen.....	12	396
Babyhead.....	Graham.....	9	154
Sel. Jersey Wakefield.....	McDonald.....	9	573
Early Winningstadt.....	Steele-Briggs.....	9	331
Kinver Globe Savoy.....	Webb.....	4	1,680
Early Summer.....	Rennie.....	3	1,502

Dala, a splendid cabbage, easily leads this year, producing an average of 13 pounds per head. Succession, usually too late for this climate, developed fine large solid heads and comes second. In most years Copenhagen Market and Enkhuizen Glory head the list, but the season proved very favourable for other varieties not usually in a foremost place. Heads of Flat Swedish were more solid than formerly. Kinver Globe Savoy had some good heads but the rest of them were useless. Ex. Amager Ballhead, a winter variety, had every head solid, a contrast to the yield of 1926.

CAULIFLOWER.—Four varieties were sown in the hotbed on May 9, transplanted to the open June 14. The cauliflower crop was somewhat of a disappointment in 1926 and not much better in 1927. It is not easy to account for the failure. The earliest was used on August 20, nearly a month later than

some years. For ten heads planted the yields are at the following rates per acre:—

YIELD OF DIFFERENT VARIETIES OF CAULIFLOWER

Variety	Source	Yield per acre	
		tons	lb.
Early Snowball.....	Graham.....	3	1,381
Danish Perfection.....	Madsen.....	2	1,687
Early Dwarf Erfurt.....	McDonald.....	1	1,751
Early Snowball.....	Madsen.....	1	662

It is not suggested that this represents the relative merits of the varieties used.

CARROTS.—The seven varieties sown May 16 produced a very satisfactory crop, of excellent cooking quality.

The Oxheart, which heads the list in yield, has formerly been thought inferior in quality, but this year no inferiority was recognized.

YIELD OF DIFFERENT VARIETIES OF CARROTS

Variety	Source	Yield per acre	
		tons	lb.
Oxheart.....	Steele-Briggs.....	15	1,125
Select Chantenay.....	McDonald.....	15	0
Improved Danvers.....	D. & F.....	14	375
Chantenay.....	O-8933.....	13	625
Chantenay.....	O-8934.....	12	1,500
Nantes Half Long.....	McDonald.....	11	875
Early Scarlet Horn.....	D. & F.....	9	750

CELERY.—For a blanching experiment, Golden Self-Blanching was sown on April 26. The variety test was seeded on May 2.

A trench was made eight inches deep, lined with well-rotted manure mixed with soil. Then a further layer of soil was filled in. In this the varieties were planted on July 12, six to seven inches apart. The soil was wet at the time. Succeeding rains filled the trenches, covering the plants completely. Whilst moisture is a *sine qua non* to celery, it does not want too much of a good thing. There was a decided check and for a week at least there was no perceptible growth. By drainage and cultivation a fair recovery was secured. The crop was a considerable improvement on that of immediately preceding years, though on account of the setback it was not the best produced at the Station. Golden Plume (Burpee), Michigan Favourite (Buckbee), and Garrahan Easy Blanching (Graham) did best, rating in order of merit. In the cultural test for blanching, the plants set on the level and earthed up grew better and were better-blanching than those in the trench. All were stored in earth in the root cellar for winter use.

CITRON.—Some plants, transplanted from the hotbed, yielded specimens three or four inches in diameter.

CORN.—Of the seventeen varieties tested, not only were all in the tassel and silk, but all had at least fairly well-formed ears. In several varieties, such as Golden Bantam, Whipple, Malakoff, and Pocahontas, the ears were not nearly usable, but a number of accessions as 60-Day Golden, Alpha, Burley, and Sunshine were just nicely coming in. The best of these were 60-Day Golden and Burleigh, several ears of which were usable. The Pickaninny and Banting were about equal in point of earliness, while both are much earlier than any of the

others. This year the yield of the Pickaninny considerably exceeded that of Banting.

A cultural test in suckering was carried out. One range had all suckers removed, while the other was left unsuckered. The result shows the suckered range to be a long way the better in point of yield of usable or nearly usable ears. This result may possibly not all be due to the suckering as some of the soil of the non-suckered range was not so mellow as that of the suckered range. The height of the corn ranged from an average of less than three feet in Pickaninny to the highest in Whipple New Yellow, seven feet tall.

CUCUMBER.—The following varieties were planted June 1, two hills of each, Davis Perfect (Graham), Early Russian (Burpee), Prolific (McKenzie), Giant Pera (D. & F.), Snow Pickling (Rennie), and West India Gherkin (Burpee). Manure was used in one hill and not in the other. Results from these varieties were fairly good. Early Russian produced the largest number, while Prolific and Davis Perfect followed closely. The yield from the hills with manure was double that of those without.

Two rows of Early Russian, 30 feet long, produced more than a ten-quart pailful of splendid pickling cucumbers.

HERBS.—Sage, Summer Savory, and Sweet Marjoram were excellent.

HORSE-RADISH.—Spreads and grows luxuriantly.

KOHL RABI.—The white and purple varieties were grown with the usual success but are in scant demand on the table.

LETTUCE.—On May 21 sixteen varieties were sown. Trianan Cos, Iceberg, and Wonderful, were first to germinate, but all had a perfect stand and healthy growth. Iceberg, a head lettuce, and Grand Rapids, loose-leaf, are preferred varieties. Early Paris Market soon goes to seed. Denver Market is latest of all.

MUSK MELON.—Nine varieties planted in hills resulted in healthy spreading vines in each case, which not only blossomed but formed fruits, many the size of eggs. Frost prevented full development. Montreal Market (Ewing) and a sugar melon, the seed of which was furnished by a Hungarian, were notably good. Seeds of these melons were sown on inverted sods in the hotbed and transplanted to the open July 8. Difficulty is usually experienced in transplanting these tender vegetables from the hotbed, but when they are sown on sod, the sod is lifted with the plant without disturbance of the roots. These plants produced fruit, the Montreal Market nearly round, 4 inches in diameter. The Hungarian plant had a specimen 6 inches long.

ONIONS.—Seed of thirteen varieties was sown on May 12 in rows 18 inches apart and 14.52 feet long duplicated. Germination was prompt on account of abundant moisture. Growth was steady, resulting in good stands.

SEED ONION VARIETY TEST, 1927

Variety	Source	Yield per acre	
		tons	lb.
Large Yellow Prizetaker.....	Graham.....	4	1,000
Yellow Globe Danvers.....	Graham.....	3	1,750
Large Red Wethersfield.....	O-8615.....	2	1,750
Yellow Globe Danvers.....	Steele-Briggs.....	2	1,625
Southport Yellow Globe.....	McKenzie.....	2	1,500
Ailsa Craig.....	Graham.....	2	1,500
Giant Prizetaker.....	Steele-Briggs.....	2	1,250
Southport Red Globe.....	Steele-Briggs.....	2	500
Southport White Globe.....	Steele-Briggs.....	2	375
Ebenezer or Japanese.....	Schell.....	2	375
White Barletta.....	McDonald.....	1	1,750
Australian Brown.....	McDonald.....	1	1,500
Yellow Globe Danvers.....	O-8693.....	1	1,250

Large Yellow Prizetaker, Graham, easily outyielded any strain of Yellow Globe Danvers or Large Red Wethersfield, two favourites at the Station.

A light hail storm bruised the tops, leaving them with quite a speckled appearance. It is often thought that turning down the tops tends to hasten maturity and prevent thick-neck, so the tops of one range were turned down, leaving the other erect, but for this season no advantage was observable.

Sets, red and yellow, yielded very good results but not equal to those from seed. Usually they are earlier, larger, and more easily matured. Root maggots did some damage.

Onions sown in hotbed and transplanted were not equal to those from seed nor to the sets.

PARSNIPS.—On May 13 two strains of Hollow Crown (C.E.F.) and one Guernsey XXX (Rennie) were sown in rows 3 feet apart and 29.04 feet long in triplicate. The ground was subjected to repeated soaking. Then, drying hard, it was difficult to cultivate into anything like a mellow condition. Nevertheless, the plants grew, always looking healthy, and the yields were good. As will be seen by the figures, the production was fairly even among the varieties.

YIELD OF DIFFERENT VARIETIES OF PARSNIPS

Varieties	Source	Yield per acre	
		tons	lb.
Guernsey XXX.....	Rennie.....	9	500
Hollow Crown.....	McKenzie.....	8	1,833
Hollow Crown.....	O-8695.....	8	1,667

In some places the roots were prongy owing to the hardness of the soil, but the sample was excellent on the whole, giving more than an average crop.

PEAS.—Twenty-one varieties and strains were included in the variety test for picking green. Sown May 20, all presented good stands and growth except Lincoln (Rennie), the seed of which must have been poor, as the same result was seen in two other plots sown for ripe peas. Gregory Surprise was the first to supply green peas, on July 28. Then on August 2 there was good picking from the two strains of Thos. Laxton, from English Wonder, Gregory Surprise, Early Morn, Little Marvel, and Manifold. Picking continued throughout August into September.

Lincoln (Sharpe), a late pea, is first, while Advancer, another late variety, has third place, indicating the nature of the season. Most of the late peas have larger pods and in a favourable year outyield the earlier peas. English Wonder, an early kind, which is second, though having comparatively small pods, is yet very prolific.

In a variety test for ripe peas, the highest yield was from Gradus x American Wonder at the rate of 2,063 pounds, or 34 bushels 23 pounds per acre, while the majority of other varieties ran from 1,200-1,900, or 20 to 30 bushels per acre.

Quite late in the season three rows 30 feet long were sown with seed from Invermere, B.C., Invermere No. 6, Bruce and Director. Along with these was sown a row of Thos. Laxton. All produced heavy crops of green peas, Thos. Laxton coming in much earlier than the others. Of the Invermere strains, Invermere 6 was first, then Director. Bruce was much the latest but the heaviest yielder of all.

PEANUTS.—Peanuts were a complete failure, only a few plants appearing, and these failed to blossom; soil apparently too cold and wet for them.

POTATOES.—Experiments have been suspended pending the propagation of disease-free stocks. This is attempted by a system of tuber-unit propagation.

PUMPKIN.—The variety test was sown in hills, seven feet apart, on June 3, in excellent soil. The Connecticut Field and three strains of Small Sugar, the fruit of which is from 6 inches to 8 inches in diameter, were used. The latter, though small, were numerous. Two hills in each case produced as follows:—

Connecticut Field.....	85½ pounds
Small Sugar (McDonald).....	77½ “
Small Sugar (Graham).....	74½ “
Small Sugar (O-3190).....	45 “

Frost necessitated taking them in just as they began to ripen. Ripening continued inside and a goodly number of pumpkin pies were enjoyed. It was the greatest supply of usable pumpkins in ten years.

RADISH.—Seed of eight varieties sown on May 21 germinated promptly and all made perfect stands. Preference continues for White Icicle and Rennie Round Scarlet Oval, which retain their crispness longer than the others. The strains of French Breakfast are excellent, especially in the early stage.

WINTER RADISH.—The long Black Spanish (Dupuy & Ferguson) and Rose China (Steele-Briggs), were sown as late as July 20. The Rose China at digging, though attaining a good size, many specimens being 6 inches long, were found so wormy as to be almost worthless. The Black, much better and of good size, being 7 to 8 inches long and 2 inches thick, were stored for winter.

RHUBARB.—The growth of the old rhubarb plants was luxuriant. As their time for dividing was overdue, the stalks in many plants while long, were thin, and ran to seed badly.

The Ruby variety, which is proving a great favourite, supplied a large quantity of red, smooth, succulent stalks. A good number of roots of this variety were distributed. Should anyone be without this earliest of spring vegetables? What more welcome and so easy to grow?

In the autumn the old patch was taken up and divided, old varieties almost entirely discarded, displaced by the Ruby.

SPINACH AND SWISS CHARD.—Four varieties of the former and two of the latter made the usual satisfactory response in sturdy healthy plants.

SQUASH.—This vegetable furnished one of the best pictures of the garden both in general appearance and in the fine nests of fruit clinging to the vines. This plantation was larger than usual, no fewer than eighteen varieties or strains being used. Among them were the Hubbard, two strains of Blue Hubbard and three strains of Golden Hubbard. There was also the Giant Crookneck with its great fruit, of interest to many visitors. Two hills were allotted to each, with manure in one; and the other without.

The Yama, Acorn, and Early White Bush yielded no fruit, while Boston Marrow produced only 2½ pounds for the two hills. Perfect Gem has small fruit, much in the shape of a cup. English Vegetable Marrow stands away at the top in point of yield, with 95 pounds for two hills. From this marrow some housekeepers make what they consider a delicious jam. Summer Asparagus Squash, new at this Station, is very prolific. While the fruits are not so large as the marrows they are more numerous and weighed 61 pounds. Blue Hubbard (Stokes), yielded 56 pounds, while Golden Hubbard (McDonald), had 48 pounds.

From the evidence concerning the use of manure one would conclude that it were better to do without, as in nearly every instance the hill without manure had the higher yield. This was true of the pumpkin hills as well. However, we have noted a contrary result in the cucumber experiment.



Vegetable marrows, September 2, showing six of eight on one bunch.

Just here may be mentioned the experiment of planting seeds on inverted sod vs. in the loose soil of the hotbed, afterward transplanting to the open.

One plant each of Vegetable marrow, Hubbard squash, and Connecticut Field pumpkin was raised on sod and a corresponding one in the loose soil of the hotbed to determine which would give the better results when transplanted.

The vegetable marrow plant on sod.....	56½	pounds
The vegetable marrow plant from soil.....	50½	"
The Hubbard squash plant on sod.....	15½	"
The Hubbard squash plant from soil.....	3	"
The Connecticut pumpkin plant on sod.....	53	"
The Connecticut pumpkin plant from soil.....	94½	"

A point to be noted in connection with the pumpkin is that the seed taken from the same packet labelled Connecticut Field produced on the sod a plant whose fruit was true to type, while the one from loose soil proved very prolific in beautiful yellow pumpkins, always yellow from the first. Thus, this comparison is not a fair one. It is difficult as a rule to transplant tender vinous vegetables from the soil of the hotbed. This year proved far more favourable than usual. Lifting the plants with the sod has a decided advantage as the roots are not disturbed.

TOMATOES.—Twenty-six varieties sown in the hotbed May 3 were transplanted June 22. The heavy rains of June made the soil soggy and the plants were at a standstill for over a week. On this account they were thrown late. Still, recovering, they made a fair showing in green fruit. One of the ranges was staked and the other left unstaked but all plants were trimmed to one stalk. A few specimens of Bonny Best (Moore), and ABB No. 2 had begun to ripen, but none were actually ripe in the variety test when they had to be picked on account of frost.

YIELD OF DIFFERENT VARIETIES OF TOMATOES

Variety	Source	Yield per acre
		lb.
1. Bonny Best S.S.	Stokes	4,848
2. Chalk Early Jewel	Steele-Briggs	4,521
3. A B B No. 2	O-11390	4,412
4. Avon Early	Dreer	3,722
5. Sparks Earliana	Burpee	3,704
6. Avon Early	Ferry	3,668
7. John Baer	Moore	3,486
8. Alacrity x Earlibel	O-6570	3,432
9. Sparks Earliana	Moore	3,415
10. Bonny Best	Moore	3,268
11. Red Head	Langdon	3,214
12. Earliest Market	Burpee	3,196
13. Bonny Best	Stokes	3,141
14. Pink No. 1	O-6574	3,141
15. L g b t No. 3	O-11392-0	3,141
16. Select Earliana Gr. 2	Langdon	3,032
17. Pink No. 2	O-6569	3,032
18. Bonny Best	Keith	2,996
19. Alacrity x Hipper	O-6568	2,796
20. Burbank	Bruce	2,451
21. Burpee-Self-Pruning	Burpee	2,433
22. Marglobe	Stokes	1,598
23. Greater Baltimore	Stokes	1,489
24. Alacrity	O-6560	1,325
25. Matchless	Livingston	1,235
26. Coreless	Livingston	781

The highest yield this time is by Bonny Best Super Standard, with Chalk Early Jewel second and a new variety from Ottawa, ABB, third. The Earlianas, usually leading, are considerably down, yet one specimen of Sparks Earliana weighed 9 ounces. The staked range greatly out-weighed the unstaked, but it had certain extra advantages in position.

In the cultural test the varieties utilized were Alacrity and Bonny Best. The main purpose was to determine the advantage or otherwise in earliness and yield, of leaving but one truss or cluster of fruit to a plant, compared with leaving two trusses, or leaving three trusses, or with leaving all trusses or clusters of fruit per plant.

Another purpose was to ascertain the advantage, if any, of removing part of the foliage. All were trained to one stem. The soggy nature of the soil for a time militated against the plants in this cultural test more than against those in the variety test, so that its value is seriously impaired, if not entirely destroyed.

Of the two varieties employed, Bonny Best gave better yields than Alacrity, but all the yields are poor. As none were ripe or ripening, the point of earliness is eliminated.

As weighed, the plants with all trusses left on, were superior to any of the others. Reckoning the value of this as 100, pruning to three trusses would rate as 95; pruning to two trusses 92; and leaving but one truss per plant stands at 80.

The plants pruned to one truss, with foliage removed back to that, looked denuded, and they were the poorest of the lot.

Plants from Hungarian seed were the only ones to ripen any fruit outside.

FALL AND SPRING SOWING

On October 25, 1926, the following vegetables were sown, each in 20-foot rows; lettuce, onions, radish, cabbage, carrots, beets and turnips. On May 4, 1927, the same vegetables were sown in rows parallel to the fall sowing.

Lettuce and carrots were the only successes in both sowings and in each the fall sowing was rather the better. Fall sowing of beets has always been a failure, though yielding a few good specimens. Spring sowing of beets is, of course, successful. Fall-sown cabbage, radish, and turnips were complete failures and the spring-sown almost so. The fall sowing of onions, though sometimes good, proved very inferior this time. The spring sowing was fair.

DATE OF PLANTING, 1927

Fourteen of the common vegetables were utilized in ascertaining the best time in spring for sowing them. The first sowing was on May 4, then every seven days down to June 8, when the sixth sowing was made.

In the following table 100 indicates the date of the highest yield. The yields of the other dates are in proportion.

RESULTS FROM DIFFERENT DATES OF PLANTING VEGETABLES

Variety	First date, May 4	Second date, May 11	Third date, May 18	Fourth date, May 25	Fifth date, June 1	Sixth date, June 8
Peas.....	100	94	92	54	61	37
Corn.....	72	93	100	61	65	20
Cabbage.....	9	100	79	43	41	13
Cauliflower.....	92	100	11	0	0	0
Squash.....	100	79	15	25	6	19
Pumpkin.....	0	70	0	90	100	0
Parsnip.....	100	54	56	79	37	68
Carrot.....	65	39	33	91	54	100
Bean.....	66	33	39	80	100	86
Radish.....	97	100	85	88	47	92
Lettuce.....	100	30	100	5	5	5
Onions.....	100	25	30	75	55	70
Parsley.....	100	60	35	40	55	20

The results indicate what is usually true in reference to peas, parsnips, lettuce, onion, and parsley, namely, that the first week in May is the most favourable time for sowing them. Radish might well be included with these. In fact, a succession of sowings of radish would be of advantage. This year the last sowing gave best results for carrots. That may not occur again for some years. Some carrots sown considerably later produced as fine samples as one would wish. The second or third week in May may generally be regarded as best for corn, though in one season best results were obtained from seed sown on April 26.

A light frost occurred on August 29, touching the upper leaves of squash, pumpkins, cucumbers, melons, and citron. Tomatoes were also slightly affected and a few leaves of potatoes were darkened somewhat. By September 26 all these had gone, with the corn as well.

FRUITS

CURRENTS

The Station received a decided addition to its currant plantation by an early shipment of 27 black (nine varieties of three each), three white and three red plants from Morden Experimental Station, besides 12 black from the Roman Catholic Mission at Grouard. These were set out under favourable conditions and with two exceptions all are healthy bushes.

The aphid was exceptionally troublesome among the old varieties. Three sprays with Black Leaf 40 scarcely kept them under control.

There was some loss through the currant fruit worm or fly (*Epocha canadensis*). While the loss was not so great as sometimes, quite a quantity of red currants were stung and fell off.

The yields are calculated on the basis of an average bush of each variety.

YIELDS OF DIFFERENT VARIETIES OF RED CURRANTS

Year	New Red Dutch	Cumberland Red O-492	Victoria Red	Fay Prolific	Wilder
	lb.	lb.	lb.	lb.	lb.
Aggregate 1917-1919.....	5.08	6.50	4.58	0.04	0.0
1920.....	7.0	4.83	6.17	0.30	0.0
1921.....	12.04	9.21	10.46	2.64	0.58
1922.....	9.42	4.88	5.31	1.79	0.15
1923.....	4.22	1.43	1.25	0.43	0.20
1924.....	15.60	12.78	15.60	5.07	6.77
1925.....	8.65	6.20	5.90	2.82	3.40
1926.....	6.67	8.44	12.34	4.17	7.67
1927.....	11.82	7.89	9.14	2.02	6.05
Average, 11 years.....	7.32	5.65	6.43	1.75	2.26

CURRANTS, 1927—AVERAGE PER BUSH EACH VARIETY

Year	White		Black	
	Large White O-551	White Cherry O-556	Collins Prolific O-565	Topsy O-568
	lb.	lb.	lb.	lb.
Aggregate 1917-1919.....	1.29	0.73	2.38	3.07
1920.....	0.17	0.83	4.33	6.33
1921.....	0.88	2.08	5.57	6.22
1922.....	1.63	1.50	0.29	1.24
1923.....	(not recorded)	(not recorded)	0.70	2.0
1924.....	11.05	12.19	0.95	0.95
1925.....	4.74	2.95	3.30	3.85
1926.....	7.81	15.75	1.33	1.71
1927.....	6.28	9.08	3.18	1.43
Average 10 years.....	3.38	4.51	.....	.....
Average 11 years.....	.....	.....	2.0	2.44

GOOSEBERRIES

The bushes of Oregon Champion set out in 1922 continue to grow in spite of some winter killing. From the 11 bushes 34 quarts were picked.

Three each of the following varieties, Pearl, Josselyn (Red Jacket), and Smith Improved, received from Morden, were set out with success.

STRAWBERRIES

The plants of this delicious fruit require good supplies of moisture, but the early wet season proved detrimental. Water running over the rows buried many plants under soil and straw.

The heavy rains of June would have required a sandy soil instead of heavy clay loam to drain away the surplus water. In consequence of this excessive moisture and owing to the fact that a large percentage of the plants were found to be non-productive the strawberry crop was a disappointment.



View of orchard and apiary.

The first bloom on Early Dakota was observed June 9, the first ripe picked July 14.

Four rows 300 feet long had been set out in 1926, with the object of showing the advantage of different methods of pruning. They were pruned: No. 1, leaving one plant to a runner; No. 2, two plants to a runner; No. 3, removing all but two runners, leaving two plants to each of these, while No. 4 had all runners left to produce the matted row. The conditions as described proved unsatisfactory to demonstrate the advantages of this pruning. However, we give results such as they are:—

All runners and all plants left.....	6 pounds	5 ounces
One plant left to each runner.....	8 "	3 "
Two plants left to a runner.....	6 "	13½ "
Two runners left to a plant and two plants to each runner.....	7 "	12½ "

Twenty-five plants of everbearing strawberries received from Assiniboine Gardens, Winnipeg, variety, Mastodon, were set out but the majority of them have died. The Station is not yet in a position to encourage investment in everbearing strawberries. However, let us live in hope.

Some very choice varieties were received from Morden, viz.: Portia, Glen Mary, Dr. Burrill, Kellogg, Marvel, Easy Picker, and Minnehaha. The stands of these are not complete.

RASPBERRIES

Raspberries wintered well and seemed to have a most suitable season. The growth of cane was all that could be desired and the crop of good-sized berries was excellent. The Herbert variety still proves the most satisfactory tested at this Station. A row 215 feet long yielded, besides the sampling, 242½ pounds, or at the rate of 5,950 pounds per acre.

PLUMS

All kinds of plum trees were severely frozen back. None were actually killed, however, but the Sapa gave slender hopes of recovering for some time. When growth began it became more vigorous than ever. Six of the Nigra

plum trees raised from pits had considerable bloom, and one at least set a few fruits. Visitors were interested to see four good-sized plums on this tree, a promise of plum possibilities in the future. They had scarcely time to ripen fully.

SANDCHERRIES

There are two varieties of these in the orchard, Hudson Bay and Select; also the Champa and Tom Thumb hybrids. The Hudson Bay being procumbent did not suffer from winter frosts as the others did. The Champa trees were a sorry sight all summer. The fruit on Hudson Bay was nearly as abundant as formerly but the others did not present half a yield. Only a small proportion ripened fully even on the Hudson Bay.

The first apple bloom was noted on June 14, on an N.E.S. tree. No fruit, however, resulted.

The apple row planted in the spring of 1926 is thriving.

Compass cherries bloomed but set no fruit.

SASKATOONS

Bloom appeared on June 4 and was in abundant fullness on June 11. Fruit was first picked from the two hedges on July 29 and continued on the pruned one right through August. Seventy-four quarts were known to have been picked from the test row, but this does not begin to represent the full crop. The pruned hedge matures its fruit very irregularly and lingeringly. The other ripens its crop together, such as occurs in a state of nature.

FLOWERS

In 1926 ground was laid out for an herbaceous border curving in horse-shoe shape between the residence and driveway. Only roses were planted then and their blooming was mentioned in the 1926 report. They comprised some of the choicest hardy varieties known, but not one survived the winter. In the fall of 1926 a large number of peonies and irises were planted and all came through safely, but 1927 being their first year, few blooms can be reported. This spring *Hesperis* (Sweet Rocket) and *Papaver nudicale* (Iceland poppy) were transplanted while in bloom. These continued blooming, and thanks to removal of fading blossoms, flowered until the heavy frosts. Roses were again planted with gratifying success. Two little *Souvenir de Claudius Pernet* held up to view great creamy fragrant roses. Hugh Dickson was not able to unfold his buds fully before frost came. *Madame Butterfly* had exquisite bloom, a pink shading to white; *General McArthur*, a little bush scarcely over 15 inches high, had seventeen buds. Some were removed, but five fine red roses were out at one time. This border when filled with annuals such as *Calendula*, *Nasturium*, *Kochia*, and *Myosotis* (Forget-me-not) was of unfailing interest.

BULBOUS PLANTS

As early as April 25 *Crocus* and *Scilla* were showing through the ground and their first bloom was observed on May 5. On May 18 *Chionodoxa* blossoms unfolded.

TULIPS

While the display in the tulip beds was gratifying, it was not equal to that of 1926. In the main bed the first bloom was seen on *Moonlight*, June 4, and

on June 6, beside Moonlight, Murillo, Rubra Maxima and Artus were displaying their colours. By June 15, Isis and Bartigon, two of the choicest Darwins, were making a fine showing. At this date the whole bed was a beautiful sight. Some varieties still had colour on July 1. Thus the period of bloom for this bed was nearly a month.

IRIS

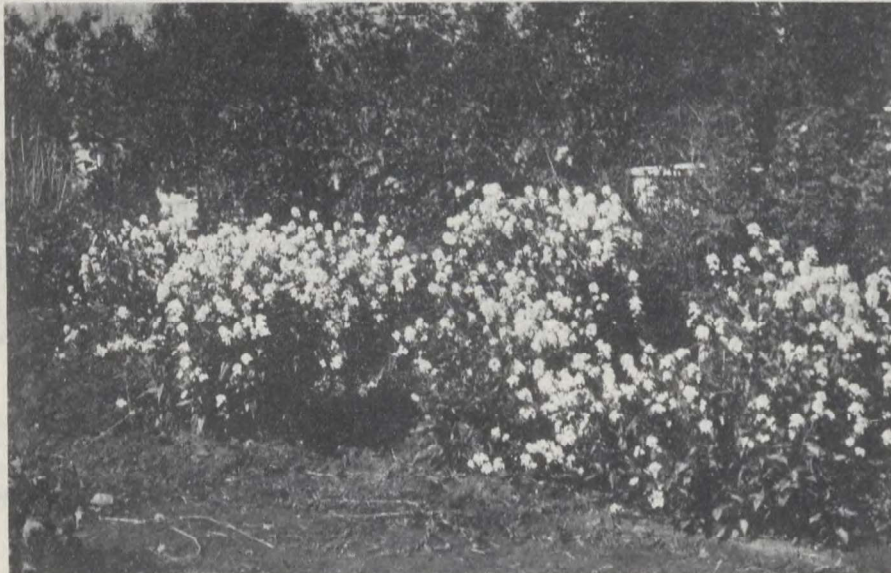
The old clumps began to carry on the display on June 27. They were in gay colour on July 4, one white shading into purple, another all yellow, and yet another with yellow standard and velvety purple fall. These irises attained a height of 28 inches.

GLADIOLUS

The bed consisted of twenty-seven varieties planted on May 30, too late to give them a fair chance. A great number of Maiden Blush unfolded their dainty flowers. Few other varieties bloomed. One specimen was lovely, almost entirely white with little dashes of bright red in the throat; another, L'Unique, yellow shading to pink with a small dash of red at the centre. A frost on September 10 ended further hope that any more of that great company would bloom. The whole were taken up on October 18, and after the corms were dried out they were stored in the cellar.

HERBACEOUS PERENNIALS

A number of perennials, planted in 1916, now after eleven years are vigorous as ever. These include Iceland poppy, Aquilegia (Columbine), Sweet Rocket, Oriental Poppy, and Delphinium (Larkspur). The white and the yellow of the Iceland poppy were first to appear on June 1. Then followed the white of Sweet Rocket and the varied colours of the Columbine. Oriental poppy dis-



Sweet Rocket in bloom.

played a gorgeous red on July 4 and immediately followed the great blue spikes of the larkspur.

ANNUALS

SWEET PEAS.—The two long rows of sweet peas were again a pleasing and distinctive feature in the year's display. Trenches were made with a plough and lined with well-rotted manure mixed with soil, then filled up with good soil, and sowing was done in that. Collections of varieties from three sources were used, viz., 12 varieties from Burpee, of Philadelphia; 22 varieties from Robt. Sydenham, of Birmingham, England; and 23 varieties from Central Experimental Farm, Ottawa.

These varieties were supported by chicken wire stretched on stakes painted white, this giving a neat appearance. They attained a height of from four to five feet. As each variety required about 6 lineal feet, the varying colours could be noted throughout the rows. When grown, they flanked with walls of bloom, the whole varied flower garden. Multitudes of bouquets carried their beauty to every part of the Peace River district, to the horticultural shows of Edmonton and Calgary, and to Prince Rupert. Seed ripened and a good quantity was gathered.

POPPIES.—A bed of poppies 18 by 25 feet, gently sloping to the highway, deserves attention. Beside some varieties whose names were not known, there were *Eschscholtzia* (California poppy), in three colours, the Shirleys, and the French *Ranunculus*, with its many shades of bloom. The whole blended in a brilliant range of harmonious yet striking colours.

BEDS.—The main bed of annuals had for centre piece a framework of chicken wire, on which climbed sweet peas and canary vine, and sloping from this, north, south, east and west, in rows 15 inches apart, were a great number of hardy annuals: calendula, aster, stock, phlox, *linaria*, *viscaria*, dianthus, candytuft, alyssum and viola. Near by were massed several rows of snapdragon in their varying heights. Though retarded for some time by soggy soil they became a compact mass of colour.

Special mention may be made of golden glow, attaining a height of six feet, covered with its yellow bloom. Zinnias attracted much attention. The improvements of varieties is very gratifying. The modest sweetness of forget-me-nots, not to be overlooked, was a welcome sight to great numbers. A circular bed of phlox in the lawn was chaste and enduring. Nasturtiums filled up many gaps with symmetry of form and beauty of colour. There was a happy blending of leptosiphon, *nemesia*, pinks, stocks, and asters in the foundation bed of the residence.

Possibly attracting most interest was the Siberian perennial *lavatera* (Rose Mallow) planted in 1924. Growing from the roots in spring, it attained a height of seven feet, and was covered with pink flowers. Only one plant of hollyhock survived the winter. It was six feet high and bloomed through September.

Another border along the east of a caragana hedge was prepared and iris in 25 varieties, hollyhocks, foxglove, geum, pentstemon, myosotis and achillea were planted.

An early frost of September 7 completely ruined zinnia, nasturtiums, amaranthus, salvia, heliotrope, tagetes and dahlias.

EFFECT OF FROST OF SEPTEMBER 24 AND 25. NOTES TAKEN SEPTEMBER 26

READING OF CAGED INSTRUMENT 25 F. ON 24; 21 F. ON 25

Not hurt	Slightly hurt	Badly hurt	Killed
Pansies Stocks Calendula Iceland Poppy Canterbury Bells Wallflower Geum Linaria Malope Achillea Larkspur Pinks Leptosiphon Sweet Rocket Antirrhinum Phlox Foxglove Myosotis Gaillardia Arabis Lupine	Annual Lavatera Kochia Hollyhocks Alyssum Verbena Petunia Mignonette	Nemesia Asters Gladioli Sweet Peas Viscaria Everlastings Golden Glow Sunflowers	Canary Vine Morning Glory

ORNAMENTAL TREES AND SHRUBS

As many of the early-planted trees and shrubs are attaining a good height and ample proportions they are increasingly beautiful and interesting, furnishing each year additional shelter and moisture. The Station is beginning to appear well clothed, the primitive bareness a thing of the past. During the blooming period one can look from the pure white bloom of the *Spirea arguta*, and of the Saskatoon hedges, to the yellows of the various species of Caragana, to the pinks of the Siberian almond and *Lonicera tatarica* (Tartarian honeysuckle) on to the lavender and purples of the different lilacs. All these colours in their fresh green setting present a pleasing effect.

Siberian almond bloomed from June 4 to 9. On June 9 *Spirea arguta* put out a few white blossoms and in a few days was a mass of snowy whiteness, and, like the snow, in a few more days quietly disappeared.

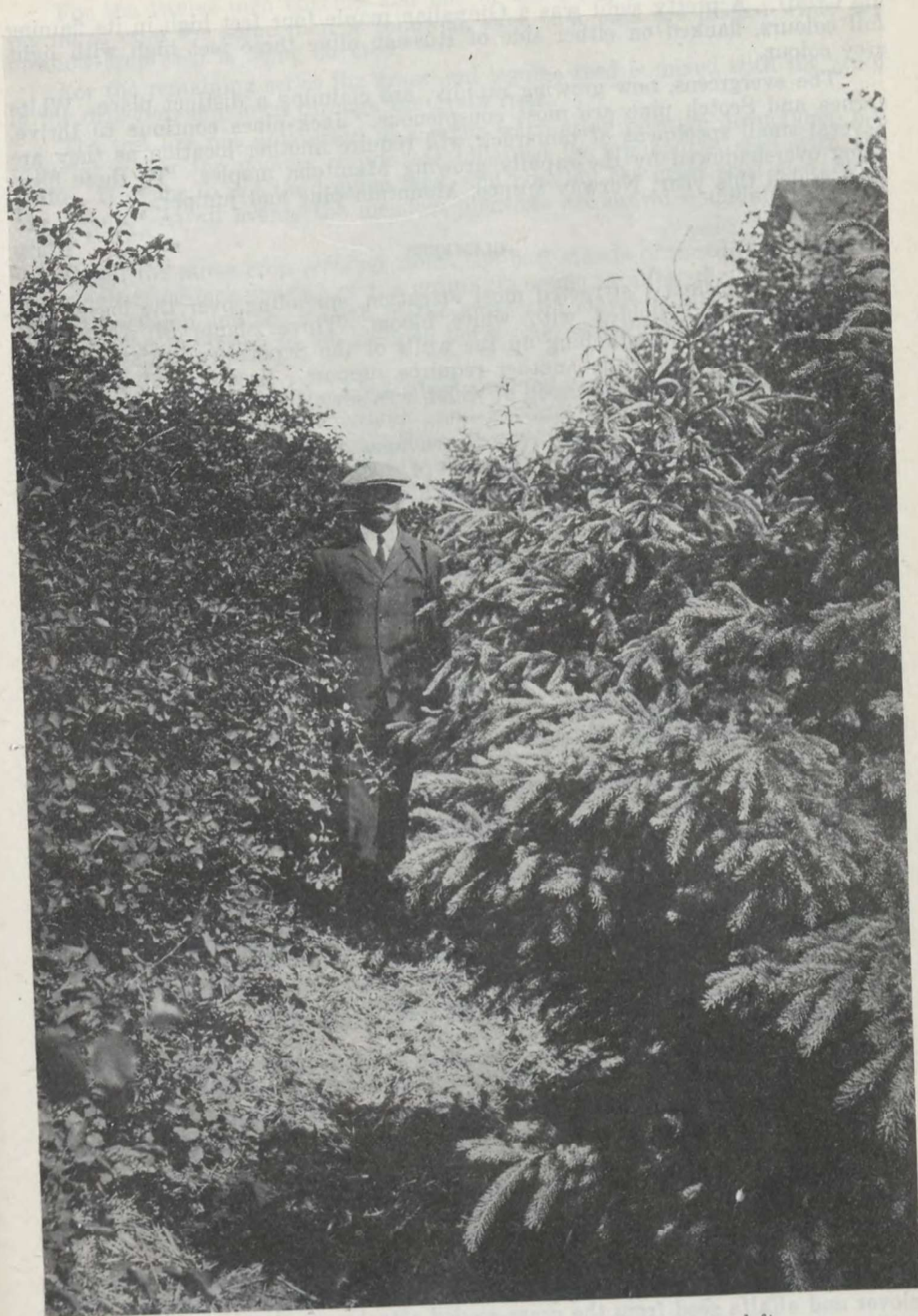
Around June 11 colour began to show on Caragana, Tartarian honeysuckle, and common lilac. On June 20 their zenith of bloom was attained, never so glorious before. On July 4 that glory was past. Chinese lilac bloom reached the climax on July 1 and was faded and gone by the 14th.

In deciduous trees, Manitoba maples still have a place. They have not shown the susceptibility to insects complained of by other Stations, but, growing readily from seeds, the little seedlings in the orchard were more abundant than lamb's quarter.

Many of the trees were badly frozen back. Five or six little elms, though cut back slightly, are still developing.

Basswoods continue to spread their broad leaves though some specimens were winter-killed. Russian poplars, vigorous as ever, are attaining considerable height. The oaks raised from acorns made as much growth as in the three previous years of their existence. Balm of Gilead and willows flourish.

To the various ornamentals, as Mountain ash, May Day tree, Russian olive, Buffalo berry, sumac, a valuable addition was made in the spring, consisting of a number of viburnum (high bush cranberry), cotoneaster, spindle tree, Ginnalian maple, Silver maple, *Cornus alba*, and *Pyrus baccata* (Flower-



Native spruce planted as twelve-inch seedlings. Saskatoon on left.

ing Crab). A pretty sight was a Ginnalian maple four feet high in its flaming fall colours, flanked on either side of Russian olive three feet high with light grey colour.

The evergreens, now growing rapidly, are claiming a distinct place. White spruce and Scotch pine are most conspicuous. Jack-pines continue to thrive. Several small specimens of tamarack will require another location as they are being overshadowed by the rapidly growing Manitoba maples. To these have been added this year, Norway spruce, Mountain pine and juniper.

CLIMBERS

The wild clematis attracted most attention, spreading over the log shelter of the hotbed, and covered with white bloom. Three plants of *Ampelopsis* (Virginia creeper) are climbing up the walls of the Superintendent's residence. One is a self-clinger, while another requires support. Seedlings of white and yellow-flowering clematis, the seed of which was sown two years ago, are making rapid progress.

No injury can be reported from the ravages of the tent caterpillar, though whole groves in the vicinity were denuded of their foliage. Our Russian poplars were the chief object of attack, but repeated spraying with arsenate of lead kept them under control.

EFFECTS OF FROST OF SEPTEMBER 24 AND 25. NOTES TAKEN SEPTEMBER 26

FRUITS.—Heart nuts killed. Little signs of injury on apple, currant, raspberry or plum.

TREES AND SHRUBS.—Affected slightly: Silver maple, Ginnalian maple, Tartarian honeysuckle and Russian poplar. Oaks were beautifully coloured. Leaves were falling from Manitoba maples, Mountain ash, poplars and Saskatoons. Lilac and willows not affected.

FIELD HUSBANDRY

METHODS OF SEEDING MEADOW CROPS

An important project commenced in 1925 is directed towards finding the best way of applying and covering meadow-crop seed on Western farms; comparing nurse crop with non-nurse crop seeding, and six-inch with twelve-inch spacing of the nurse crop, the quantity per acre in the latter case being exactly half that employed in the former.

Three successive seedings have been made and in 1926 the experiment was amplified by introducing into each method three different depths of covering.

The mixture of grass and legume seeds used is a 4-4-4-4 combination, consisting of four pounds each per acre of alfalfa, sweet clover, western rye grass and brome.

The nurse crop is Banner oats at two bushels per acre in the six-inch spacing and one bushel in the twelve-inch, the index lever being unchanged for the latter but every alternate grain run stopped up.

The non-nurse crop plots are seeded by broadcasting of the grass seed by hand, this being followed with the single-disk drill which scatters the sweet clover and alfalfa seed from the grass-seeded attachment throwing ahead of the drill runs. The disks cover all the seed.

For the twelve-inch spacing and one of the series of six-inch spacings of the nurse crop the same plan is followed, save that oats are drilled while the meadow-crop seed is being covered.

For the remaining series the grass and legume seed is mixed with the grain in the drill-box and sown through the grain runs.

The test has not progressed to a point warranting positive deductions, but thus far rather the poorest results are obtained by mixing the seed with the grain. It seems to put the legume seed, and possibly the grass seed also, down too deeply. At all events the meadow plantlets are crowded unduly with the grain.

Of all the nurse-crop seedings much the best stands of meadow are secured with the twelve-inch spacing of the grain. It seems to allow the "seeds" more room to develop and the growth of the grass and clover plants is intermediate between that occurring in the six-inch nurse crop and the non-nurse crop seedings.

Of course, it affords the same liberty of action to the weeds and by rights the test should be conducted without hand-weeding of any plots. But this would introduce two other difficulties. First, the weeds would have to be removed before haying, else the weed growth might be reported as hay. Secondly, the maturing of quantities of weed seeds would complicate other work on adjacent areas and future experiments on the area occupied. It seems best, therefore, to weed the plots betimes and depend upon observations regarding the weed factor. No decision has been reached as to the relative merit and demerit of the plan of seeding in 12-inch drills, but it seems to be worthy of a thorough test.

Comparing ordinary nurse-crop with non-nurse-crop seeding, we find indications in line with those shown by previous elaborate seedings at Beaverlodge. That is to say, a nurse crop does much to hold weeds in check during the season of seeding but greatly dwarfs the growth of meadow plants, resulting in a late, weak start of these the following spring, with many weeds competing with them then. Meadow crops seeded alone may be very weedy the first year, but if this initial weed growth can be controlled the stands of hay are likely to be clean and rank in the next season. However, while non-nurse-crop plots surpass by one or two hundred per cent the yields of nurse-crop plots the season after seeding, the hay yields are liable to be roughly equal in the second hay-crop year, while if to the hay produced by the nurse-crop plots is added the tonnage of grain bundles produced in the initial season, the aggregate production (grain and hay together) is usually by the end of the third year decidedly in favour of the nurse-crop rotation.

METHODS-OF-SEEDING TEST, 1925 SEEDING

Presenting results in pounds of cured hay per acre of the 1926 and 1927 crops, along with the 1925 yield of oats used as nurse crop.

	Yield oat hay per acre in 1925	Yield grass hay per acre in 1926 (after- math not taken)	Yield grass hay per acre in 1927 (after- math- not taken)	Total hay two years	Total crop three years
	lb.	lb.	lb.	lb.	lb.
Seeded with two bushels oats per acre, 6-inch spacing, meadow mixture sown ahead of drill	5,100	1,505	7,311	8,816	13,916
Seeded with one bushel oats per acre, 12-inch spacing, meadow mixture sown ahead of drill	4,133	2,874	7,678	10,552	14,685
Seeded with two bushels oats per acre, 6-inch spacing, meadow mixture sown with grain in drill-box	3,278	1,528	6,897	8,425	11,703
Seeded without nurse crop. Covered with drill disks . . . . .	.....	4,729	5,804	10,533	10,533

¹ Seeded in duplicate on June 15, 1925, on summer fallowed land.

² The south-range plot seeded with oats in 12-inch drills had by mischance, double the intended quota of grass seed.

³ Grasshoppers consumed the grasses in 1925 but left a fairly regular stand of the legumes, which made a rank growth. Sweet clover was knee-high September 8 in the non-nurse crop plots. Both legumes made a good growth where seeded with oats in 12-inch drills, a weaker stand where seeded ahead of the oats in 6-inch drills and the poorest stand where seeded with oats in the drill box.

⁴ The nurse crop was bound September 8. The oats seeded in 12-inch drills yielded 81 per cent as much dry matter per acre as oats in 6-inch drills.

⁵ The plots where the grasses and legumes had been seeded with oats through the drill runs made such a weak stand in the spring of 1926 that they required considerable hand weeding to preserve the stands.

⁶ In 1926 the plots were hand weeded just before haying and cut July 8. A good aftermath grew on these plots but was not removed.

⁷ In 1927 these plots were through pressure of work, left standing until August 1 and 3. The result was an exaggerated yield but poor quality of hay.

TOPOGRAPHY AS AFFECTING MINIMUM TEMPERATURES

The study of topography as influencing the occurrence of minimum temperatures, especially frost, was continued in 1927 along lines developing out of the observations in previous seasons. (See reports Beaverlodge Sub-Station, 1925 and 1926.) Some alterations were made in the placing of the instruments.

SITUATION

The Sub-Station lies on the eastern slope of a hog's back ridge, dividing two valleys, which converge about a mile to the south, the ridge tapering pretty steadily towards that point. East of the farm is a slough, which, with its adjoining willow flat, is nearly a mile wide. East of the willow flat is another long regular ascent of fully a mile and a half. Northeast of the slough is a large wooded hill with an elevation of five or six hundred feet above the surrounding region. The drainage of the slough is towards the southeast but is not very free, the slough being edged on most of its southern boundary by a low rim of soil and draining through a willow bottom, which must impede air movement somewhat. The slough may therefore be described as semi-basin in character, hence there is probably more than an ordinary degree of tendency for cold air to settle in it. Locally it is recognized as a particularly frosty spot.

A township road allowance, maintained as a Provincial highway, crosses the slough and traverses the ridge on which the Station is situated. From the edge of the slough to the apex of the ridge where crossed by the highway is a distance of 214 rods. The rise is 134 feet and for the most part very gradual. The official-instrument cage, situated at the building site, is about half a mile from the slough and is 107.4 feet above the observation post there.

Along the road allowance there were placed on May 1, 1927, six self-registering minimum thermometers at equal successive rises of 26.8 feet. The distances apart are also fairly uniform, although not exactly so.

UNCAGED INSTRUMENTS READ LOWER THAN CAGED

The instruments were all placed at the usual height of $3\frac{1}{2}$ feet above the ground level but are uncaged. Previous years' observations showed that uncaged minimum instruments often read appreciably lower than those caged according to standard specifications of the Meteorological Service. Therefore, for the purpose of this study, the official thermometer has not been used as one of the series although it happens to be almost precisely on a level with the fifth one of the line. An interesting incidental comparison between these two—one (uncaged) on the road allowance, and the other (caged) on the lawn some fifteen rods back from the road—is afforded by the second and third column from the right of each table. On the average, the caged instrument read 1.76 degrees higher than the uncaged one at the same elevation.

GREATEST CONCENTRATION OF COLD AT BOTTOM OF BASIN

The eight months' data are presented in three very instructive tables. One shows the spreads between the average minimum temperatures; a second the spreads between the mildest minimum readings of each month, and a third table the spreads between the most extreme low dips for each month. Perhaps the comparison of average minima is most conclusive.

Perusal of this table reveals that there is a gradual decrease in the spreads between any two stations as one ascends the slope. Whilst there is 2.29 degrees spread between the first and the second there is only 1.27 between the second and third, and, allowing for one erratic instrument, the spread diminishes steadily to only 0.84 degrees between the fifth and sixth. One reason may be that the diameter and therefore the cubical content of the semi-basin expands as one proceeds up the slope, hence one might expect a progressively less concentration of cold air as one ascended.

LARGE SPREADS IN THE READINGS

It is striking that as between the highest and lowest points the average nightly spread is 6.59 degrees.

Of still more crucial importance is the spread between the monthly extremes, since it takes only one frost to kill a crop. This shows a mean spread of 8.5 degrees between the highest and the lowest points. In May the greatest spread on any one night was six degrees; in June five degrees; July nine degrees; August nine; September three; October nine; November thirteen, and December fourteen degrees.

As in 1926, it was noticed that while the most extreme spreads in one night's reading were liable to occur in winter, the table of average minimum temperatures did not show a very great partiality to one season above another, although December exhibited the greatest average spread as well as the most extreme spread. However, the second-greatest average spread was during August.

TABLE COMPARING MONTHLY MEANS OF MINIMUM TEMPERATURES RECORDED BY FULLY EXPOSED SELF-REGISTERING THERMOMETERS PLACED AT EQUAL SUCCESSIVE RISES ON A GRADUAL 214-ROD SLOPE WITH A TOTAL ASCENT OF 134 FEET, BEAVERLODGE, 1927

Month	No. 1 (slough)		No. 2		No. 3		No. 4*		No. 5		Half of spread between Nos. 3 and 5		No. 6		Official minimum (caged) same level as No. 5		Total spread between highest and lowest thermometer 1 and 6	
	Temperature	De-grees above (+) or below (-) No. 1	Temperature	De-grees above (+) or below (-) No. 2	Temperature	De-grees above (+) or below (-) No. 3	Temperature	De-grees above (+) or below (-) No. 4	Temperature	De-grees above (+) or below (-) No. 5	Temperature	De-grees above (+) or below (-) No. 6	Temperature	De-grees above (+) or below (-) No. 6	Temperature	De-grees above (+) or below (-) No. 5	Temperature	De-grees above (+) or below (-) No. 5
January	30.77	+1.29	33.19	+1.13	34.19	+1.00	34.77	+0.58	35.45	+0.68	36.13	+0.68	36.13	+1.36	36.13	+1.36	44.68	+8.55
February	40.43	+1.04	42.43	+0.96	43.67	+1.24	44.2	+0.53	44.73	+0.53	45.3	+0.57	45.3	+1.1	45.3	+1.1	44.30	+3.87
March	42.48	+1.52	45.23	+1.23	47.06	+1.83	47.9	+0.84	48.23	+0.33	48.0	+0.1	48.0	+0.1	48.0	+0.1	45.75	+3.27
April	37.28	+2.97	42.03	+1.77	43.32	+1.41	44.81	+1.23	45.94	+1.13	46.43	+1.67	46.43	+1.67	46.43	+1.67	48.65	+11.37
May	30.57	+1.63	33.13	+0.93	34.40	+1.27	35.37	+0.97	36.47	+1.10	37.87	+1.40	37.87	+1.40	37.87	+1.40	45.90	+15.33
June	21.45	+3.43	25.52	+0.58	25.84	+0.32	26.48	+0.64	27.77	+1.28	28.13	+0.36	28.13	+0.36	28.13	+0.36	32.32	+10.87
July	-8.97	+2.24	-5.20	+1.53	-3.9	+1.3	-3.1	+0.8	-3.1	+0.8	-2.33	+0.77	-2.33	+0.77	-2.33	+0.77	6.64	+15.61
August	-20.23	+4.13	-14.06	+2.04	-13.48	+0.59	-10.68	+2.80	-10.68	+2.80	-9.77	+0.91	-9.77	+0.91	-9.77	+0.91	10.46	+20.43
September	21.72	24.01	25.28	1.27	26.41	1.13	27.47	1.06	27.47	1.06	28.31	0.84	28.31	0.84	28.31	0.84	29.23	1.76
October																		
November																		
December																		
Average	21.72	24.01	25.28	1.27	26.41	1.13	27.47	1.06	27.47	1.06	28.31	0.84	28.31	0.84	28.31	0.84	29.23	1.76

*Erratic instrument.

TABLE COMPARING EXTREME TEMPERATURES IN EACH MONTH RECORDED BY FULLY EXPOSED SELF-REGISTERING THERMOMETERS PLACED AT EQUAL SUCCESSIVE RISES ON A GRADUAL 2 1/4-ROD SLOPE WITH A TOTAL ASCENT OF 134 FEET, BEAVERLODGE, 1927

Month	No. 1 (stough)		No. 2		No. 3		No. 4*		No. 5		Half of spread between Nos. 3 and 5		No. 6		Official minimum (caged) same level as No. 5		Total spread between highest and lowest thermometer 1 and 6
	Temperature	De-grees above (+) or below (-) No. 1	Temperature	De-grees above (+) or below (-) No. 2	Temperature	De-grees above (+) or below (-) No. 3	Temperature	De-grees above (+) or below (-) No. 4	Temperature	De-grees above (+) or below (-) No. 5	Temperature	De-grees above (+) or below (-) No. 6	Temperature	De-grees above (+) or below (-) No. 5			
May.....	20	+2	25	+3	25	0	25	0	25	0	0	26	+1	26	+1	+6	
June.....	30	+1	33	+2	34	+1	34	0	34	+0.5	+0.5	35	+1	35	+1	+5	
July.....	31	+3	34	0	38	+4	40	+2	40	+3	+3	41	0	41	+1	+9	
August.....	23	+2	27	+2	29	+2	31	+2	31	+2	+2	32	+1	33	+2	+9	
September.....	15	+1	16	0	16	0	16	0	16	0	0	18	+2	21	+5	+3	
October.....	7	+3	11	+1	13	+2	15	+2	15	+2	+2	16	+1	18	+3	+9	
November.....	-36	+6	-27	+3	-25	+2	-25	0	-25	0	+1	-23	+1	-21	+4	+13	
December.....	-55	+5	-46	+4	-46	0	-46	+4	-42	+4	+2	-41	+1	-38	+4	+14	
Average.....	4.38	7.25	9.13	1.88	10.5	1.38	11.75	1.25	12.88	1.31	14.38	1.13	2.63	8.5			

*Erratic instrument.

TABLE COMPARING THE MILDEST MINIMUM TEMPERATURES IN EACH MONTH RECORDED BY FULLY EXPOSED SELF-REGISTERING THERMOMETERS PLACED AT EQUAL SUCCESSIVE RISES ON A GRADUAL 214-ROD SLOPE WITH A TOTAL ASCENT OF 134 FEET, BEAVERLODGE, 1927

Month	No. 1 (slough)		No. 2		No. 3		No. 4*		No. 5		Half of spread between Nos. 3 and 5		No. 6		Official minimum (caged) same level as No. 5		Total spread between highest and lowest thermometer 1 and 6
	Temperature	De-grees above (+) or below (-) No. 1	Temperature	De-grees above (+) or below (-) No. 2	Temperature	De-grees above (+) or below (-) No. 3	Temperature	De-grees above (+) or below (-) No. 4	Temperature	De-grees above (+) or below (-) No. 5	Temperature	De-grees above (+) or below (-) No. 6	Temperature	De-grees above (+) or below (-) No. 5			
May.....	44	+1	47	+2	49	+2	49	0	+1	49	0	+1	49	0	49	0	+5
June.....	51	-1	51	+1	53	+2	53	0	+1	53	0	+1	53	-1	52	-1	+2
July.....	53	-1	52	0	53	+1	54	+1	+1	54	0	+1	54	0	54	0	+1
August.....	52	-1	52	+1	52	0	52	0	0	53	+1	0	53	+1	54	+2	+1
September.....	41	+1	45	+3	45	0	45	0	+1	46	+1	+0.5	45	-1	49	+3	+4
October.....	41	+1	42	0	42	0	42	0	-1	41	-1	-0.5	42	+1	42	+1	+1
November.....	27	0	27	0	27	0	27	0	+1	28	+1	+0.5	30	-1	27	-1	+3
December.....	16	+4	20	0	20	0	20	0	+2	22	+2	+1	24	+2	26	+4	+8
Average.....	40.63	0.5	42.0	0.88	42.63	0.63	43.13	0.5	0.56	43.75	0.63	44.13	1.0	3.13			

*Erratic instrument.

SOIL TEMPERATURES

Soil temperatures as gauged by the Friez soil and water thermograph with bulb three inches beneath the surface of summer-fallowed ground ranged much the same as formerly. On 185 days the temperature exceeded freezing. On 161 days it rose above 40 degrees Fah. On 120 days it exceeded 50 degrees Fah., on 69 days it was above 60 degrees Fah., on 30 days it exceeded 70, and on 15 days it exceeded 75 degrees Fah. The highest was 80.5 degrees Fah. on July 1.

The winter records continue to be very interesting. It is proving that when there is a fair cushion of snow on the ground, the soil temperature at three inches depth has never dropped lower than 15 degrees Fah., and seldom goes that low; but if a cold snap occurs when the ground is bare of snow the needle will drop to 5 degrees and would at times go lower if the mechanism were adapted to record lower temperatures.

The winter of 1926-27 was one of the worst in ten years for root-killing of over-wintered crops, hence it is not surprising to find in that winter readings of 9.5 degrees on December 26, and 5 degrees or below for three twenty-four-hour days in January, 1927. Moreover, fairly low soil temperatures had continued for a period of two weeks or so. This condition was due not to abnormally low atmospheric temperatures, for the January minimum was only -28 degrees on the 17th. The soil temperature was low because there was little or no snow on the ground.

SOIL THERMOGRAPH DATA, BEAVERLODGE, 1927

Table showing number of days in each month of 1927 that the soil temperature, as registered by a Friez thermograph with bulb three inches beneath the ground surface of summer-fallowed ground, rose at any time above the respective degrees specified.

Month	Days above 32° Fah.	Days above 40° Fah.	Days above 45° Fah.	Days above 50° Fah.	Days above 55° Fah.	Days above 60° Fah.	Days above 65° Fah.	Days above 70° Fah.	Days above 75° Fah.
January.....	0	0	0	0	0	0	0	0	0
February.....	0	0	0	0	0	0	0	0	0
March.....	0	0	0	0	0	0	0	0	0
April.....	10	3	0	0	0	0	0	0	0
May.....	31	30	20	9	2	0	0	0	0
June.....	30	30	30	29	20	11	6	0	0
July.....	31	31	31	31	29	24	18	11	6
August.....	31	31	31	31	31	29	27	19	9
September.....	30	29	27	20	13	5	2	0	0
October.....	22	7	1	0	0	0	0	0	0
November.....	0	0	0	0	0	0	0	0	0
December.....	0	0	0	0	0	0	0	0	0
	185	161	140	120	95	69	53	30	15

AVERAGES OF MONTHLY SOIL THERMOGRAPH RECORDS, BEAVERLODGE, 1927

Month	Average monthly Minimum	Average monthly Maximum	Average monthly mean	Lowest temperature for the month	Date and hour of lowest temperature	Highest temperature for the month	Date and hour of highest temperature
January.....	14.66	17.06	15.86	9.0	11th 12 p.m.	26.5	1st 3 p.m. 2nd 12 a.m.
February.....	21.73	22.42	22.07	20.5	1st 12 p.m. 2nd 4 p.m. 3rd 4 p.m. 4th 2 p.m. 6th 12 noon 8th 4 p.m. 17th 12 p.m.	24.0	12th 9 a.m. 26th 12 p.m. 27th 9 a.m.
March.....	25.19	26.20	25.70	23.5	1st 12 a.m. 2nd 2 p.m. 3rd 3 p.m. 14th 2 p.m.	28.5	30th 11 p.m. 31st 12 a.m.
April.....	28.30	32.10	30.2	23.0	9th 9 a.m.	44.0	26th 2 p.m.
May.....	35.2	47.8	41.5	30.0	1st 8 a.m. 2nd 9 a.m. 3rd 6 a.m. 5th 8 a.m. 6th 8 a.m.	57.0	22nd 5 p.m.
June.....	46.45	58.71	52.58	38.0	2nd 5 a.m.	70.0	20th 4 p.m.
July.....	51.5	67.0	59.25	44.0	1st 6 a.m.	80.5	23rd 5 p.m.
August.....	53.40	71.56	62.48	46.0	28th 7 a.m.	79.5	2nd 4 p.m.
September.....	40.53	54.20	47.37	32.5	25th 8 a.m.	67.0	9th 3 p.m.
October.....	32.21	36.77	34.49	28.0	28th 7 a.m. 29th 6 a.m.	47.0	10th 5 p.m.
November.....	22.48	23.95	23.22	15.0	16th 3 a.m.	28.0	1st 9 p.m. 2nd 6 a.m. 3rd 1 p.m. 4th 8 p.m. 5th 6 p.m.
December.....	20.35	21.81	21.08	15.0	10th 11 a.m.	26.0	5th 6 a.m.

On three days the minimum was 5 degrees or below. For these days the reading was for purposes of averaging taken as 5 degrees.

UTILIZING SNOW MOISTURE

In 1926 three rows of sunflowers were left standing at each of three parallel lines running north and south along a gradual eastern slope. The heads were lopped off in autumn and used for ensilage, the beheaded stalks being left standing to catch drifts of snow. Easterly and westerly winds lodged snow on each side of the triple rows, and in spring the drifts appeared as straight, parallel windrows of snow, whereas in other fields the snow lay in irregular patches according to accident of contour in relation to drifting winds.

It was the intention to utilize in spring the moisture from the melting drifts by drawing light furrows in an oblique direction down the slopes, thus leading the water to soak the drying ridges. As it happened, there was an excess of spring moisture anyway, with an anxiously delayed seeding, so that little use could be made of the snow moisture. It might be remarked, however, that the regular banks of snow were certainly of no disadvantage as compared with the irregular patches occurring elsewhere all too frequently in the draws and hollows. In some years the regular drifts running along the slopes might be used to considerable advantage.

SOIL FERTILITY, 1927

THE NITRATE TEST WITH RAPE

In a fairly extensive test where nitrate of soda was applied to rows and broadcast stands of rape on spring ploughing and summer-fallow the greatest increase was obtained from the broadcast stands on spring ploughing.

The stands on the summer-fallow plots were uniform but at best yielded only half a crop. The application of nitrate to the broadcast plots on summer-fallow produced a slightly heavier crop than was obtained without the use of the nitrate. The crop from rows under the same treatment was considerably heavier on the non-nitrate plots on the average although in two ranges the nitrate plots produced by far the heavier crop.

On spring ploughing the broadcast areas outyielded the row but in either case the stands while fairly uniform were short and had a starved appearance throughout most of the season. Here the nitrate plots produced 38 per cent more dry matter in the case of the broadcast plots and 22 per cent for the rows.

The results of this test are in line with those of other tests conducted recently. The accumulation of nitrates in the summer-fallow doubtless prevented any very great advantage from the application of nitrate of soda. Where the supply of available nitrates was practically exhausted due to the heavy stand of oats and the resulting aftermath in 1926, the effect of the nitrate applications is quite noticeable, especially in the broadcast plots where the feeding limits of the roots are restricted and where there was no cultivation to stimulate nitrification.

NITRATE TEST WITH RAPE, 1927

Designation	Yield per acre					
	Green weight		Absolute dry matter		Per cent dry matter	
	Nitrate	Non-nitrate	Nitrate	Non-nitrate	Nitrate	Non-nitrate
	lb.	lb.	lb.	lb.		
Spring ploughing—						
Broadcast.....	10,560	7,480	3,810	2,765	36.08	36.97
Rows.....	10,727	7,647	2,815	2,298	26.24	30.05
Summer-fallow—						
Broadcast.....	20,027	19,580	5,402	5,042	26.19	25.75
Rows.....	16,720	17,270	3,721	4,527.5	22.25	26.22

RESIDUAL EFFECTS OF VARIOUS GRASS SODS

In 1923 plots of brome grass, Kentucky blue, Meadow fescue, Western rye grass, timothy, alfalfa, Sweet clover and three of the small clovers were sown without nurse crop as check ranges in a meadow test. Half of each plot was cropped in the season of seeding. The remaining halves were uncropped until 1924. All the plots except the Sweet clover were cropped in 1924, 1925, and 1926, being then ploughed July 26 and 27 after haying. The land was double-disked August 5 and cross-disked on November 4 but did not seem to have rotted well and with a view especially to the killing of the brome it was all backset on November 6. The Kentucky blue and brome sods turned up raw and leathery, more especially the former.

In the spring this was laboriously worked down with disk harrow, float and drag harrow, but many operations failed to reduce the blue-grass sod, and germination on it proved poor. Garnet wheat was cross-drilled on this area about the end of the first week in May.

On June 8 nitrate of soda at 160 pounds per acre was sown on a seven-foot strip across the plots, the soil at the time being dry with no immediate prospect of rain.

In July quite an increase in growth was observed on the fertilized strip, but since it was along a headland where complications arose from the turning while abutting plots were being seeded, it was not considered that the test was fair and no comparative yields were taken, although the benefit was thought to persist until after harvest.

On September 2 the wheat was harvested with a six-foot binder, a full swath eight rods long being taken from each strip of sod, this making an area of one-fifty-fifth of an acre. Lodging complicated the results so that some of the plots which were least promising in the early part of the season turned out much better than their early appearance promised.

There was some ambiguity concerning the yields of the alfalfa and sweet-clover areas so that these are not reported, nor were the sods of the small clovers, considered, as lodging on these was excessive.

RESIDUAL-EFFECTS TEST, GARNET WHEAT, 1927, AFTER SOD OF GRASS PLOTS SEEDING IN 1923

Sod	Yield of crop per acre	
	Total crop	Threshed grain
	lb.	lb.
Brome sod.....average	2,007.5	990.0
Kentucky blue....."	1,993.75	1,086.25
Meadow fescue....."	2,571.25	1,333.75
Timothy....."	3,410.0	1,581.25
Western rye....."	3,203.75	1,512.5

BEEES

THE SEASON

In October, 1926, sixteen colonies and nuclei were packed into winter quarters, in quadruple cases, wheat straw having been used for insulating material. The colonies were well up to wintering weight and in spring very few showed any signs of starvation, although a quantity of food had granulated, owing, it is thought, to late feeding and fall honey. The winter was long and severe, lasting, from flight to flight, almost seven months—a marked contrast to the 1925-26 winter, when practically every month allowed of outside exercise. The season opened with a sharp cold snap, before there was adequate snow protection. On this occasion the cases were not banked with shoveled snow, as had been done in a previous year. The late winter afforded a good blanket but cold spells were long and continuous. Outdoor-wintering, results were disastrous; a large part of this loss must, however, be attributed to spring rather than winter.

Spring was deceptive; a few bright warm days lured the bees to a cleansing flight, enjoyed by eight or nine colonies, although many bees perished in the low temperature of the outer air. Cold weather followed this temporary warmth and a heavy snowfall once more confined the bees. It was not till May 11 that an examination was possible. Even then only a hasty glance was permitted. Inspection revealed two colonies alive, of which one perished before the next examination. The early honey flow failed to materialize and had stock not been plentifully supplied with over-wintered stores feeding would have been necessary. In previous years a substantial building-up ration had been obtained from early flowers and wild fruits, but in 1927 bloom was late and weather unfavourable, even the bloom of the Manitoba maples passing unnoticed. With such conditions it is not surprising that "spring dwindling" took a heavy toll. With the beginning of June normal conditions returned and though no surplus was deposited the colonies worked and thrived vigorously.

Early summer, while yielding no harvest till mid July, gave the bees a chance to strengthen and when on July 19 the scales went down with the first

surplus of nectar, the field force was well built up. The sweet-clover flow lasted till August 25, a total of 37 days. During this period the weather was very favourable for foraging and nectar secretion. Following the cessation of the clover flow, some darker autumn honey appeared in the combs but scarcely enough was coming in to balance consumption and evaporation. On September 15 a light frost dried up the nectar sources though bees were afterwards seen on a few lingering sweet clover and other blooms.

PACKAGES

History was repeated when the 1927 consignment of five two-pound packages arrived from Alabama in the midst of a period of most unfavourable weather and had to be held indoors for several days. The bees arrived at the station on May 24 and it was not till June 3 that close examination was possible. Of the five queens four died before the end of the season, due possibly to rigorous travel and long confinement. The weight of the live bees surviving the trip varied from 12½ ounces to 29 ounces. There was also a considerable variation in the amount of food consumed in transit, but no definite relationship could be traced between these conditions. The packages, hived on drawn foundation, built up rapidly and in spite of re-queening two harvested creditable crops. Owing to weakness and queenlessness two had to be united on July 23 while the fifth was divided for increase.

MANAGEMENT

The apiary, consisting of six colonies, was manipulated for the production of extracted honey only. Enough comb honey was produced to satisfy the demand for exhibition and publicity purposes. It is noteworthy that sections were filled and capped by strong colonies with little effort, showing that the production of the comb article would have been easily possible. Since most of the colonies were headed by young queens, no swarming tendencies were observed and experiments along lines of swarm control were impossible. In previous years the difficulty of obtaining laying queens when required had been felt and in 1926 a few poorer queens had been raised naturally by queenless nuclei to use temporarily. During the 1927 season a supply of queens were raised by the grafting method, providing excellent producers. As in previous years, those colonies in which queen excluders were used most sparingly gave best returns. Plenty of dry comb was kept in the brood chamber and first super, so that an abundant supply of laying space was always provided. A shallow super full of unripened honey was kept over the first super. With these conditions the queen seldom, if ever, wanders. Though this method calls for a slight extra effort, yet it prevents swarming to a great extent and draws the bees to the super with the honey combs removed from the brood chamber. A queen excluder often proves an almost impenetrable barrier for a weak, listless colony.

Feeding commenced on September 10 and ended on September 30, at which date four colonies were loosely packed with straw, two being reserved for cellar wintering. Planer shavings were later substituted in part, and a thick shavings quilt was placed over the colonies in the outdoor cases.

RESULTS

The result of outdoor wintering was one colony overwintered from eleven colonies and five nuclei packed in 1926. No colonies were cellar-wintered. From four producing colonies a total of 432 pounds of honey was produced, or an average of 108 pounds per colony. About 20 per cent of the crop was left in the combs owing to granulation. This loss is not allowed for in the crop figures given. The largest single colony yield was 226 pounds from a two-pound package hived on May 24 on drawn comb. The greatest 24-hour income from the

colony of scales was 12.5 pounds on August 9, a contrast with 20.5 for August 23, 1926. Queens were raised to supply the station apiary and a few distributed to beekeepers. Practically all the honey extracted was obtained from sweet clover bloom, but was scarcely of so fine a quality as that of previous years.

The apiary was very capably handled by an enthusiastic young beekeeper, George Neely, who has prepared the foregoing report.

EXTENSION AND PUBLICITY, BEAVERLODGE, 1927

The scope of the extension work was limited by inadequacy of clerical assistance, the superintendent being largely tied to office routine.

Correspondence showed a healthy increase. Letters received numbered 1,723 as compared with 1,596 in the previous twelvemonth. There were 1,749 sealed missives despatched, besides some postcards and 168 circulars.

One hundred and nine packets of seeds, chiefly ornamentals, were distributed, while 373 applicants received, in all, 649 labelled packets of small-fruit and ornamental stock.

Co-operative testing was extended to include cereals as well as forage crops.

A visit was paid to the Illustration Station at Fort St. John, B.C., where excellent work is being accomplished under immediate supervision from Beaverlodge.

From pressure of time only one lantern-slide lecture was given. It was well received by a capacity audience.

A weed short course, put on by the Provincial Department of Agriculture, was participated in, and response was made to sundry other calls.

Exhibits of the station's produce were prepared for two local fairs, for the Calgary and Edmonton Horticultural Exhibitions, and for a Grande Prairie Board of Trade display at the Prince Rupert Exhibition. The three "outside" exhibits were particularly well received and favourably commented upon. A sheaf collection was collated for the Canadian National Railway offices in Edmonton.

By request of the Division of Extension and Publicity six short articles were prepared for newspaper use and two others for "Seasonable Hints" Requests for special articles and illustrations were more numerous than could all be complied with.

Nearly a hundred good photographs were taken. The demand for these from boards of trade, colonization agencies' journalists, publicists; and others is almost insatiable.

For some years past the Sub-station has constituted itself an informal Bureau of Publicity for information concerning Northern Alberta. Much has been given out by letter and interview. For example, half a dozen photographs and some notes were contributed to F. H. Kitto's popular pamphlet on the Peace River country, published by the Natural Resources Intelligence Branch of the Department of the Interior.

Summer visitors were more numerous, and not less appreciative, than ever before.

In June forty-three of the sixty members of the Provincial Legislature touring the district were shown over the work and entertained at luncheon by the station in co-operation with local residents. A smaller party in October was headed by the Provincial Premier and His Honour Lieut.-Governor Dr. Egbert. Memoranda of data were presented to the members.

A flying visit to the station was paid by some members of the party of Hon. Dr. J. H. King, Dominion Minister of Soldiers' Civil Re-establishment.