DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

SIDNEY, B.C.

REPORT OF THE SUPERINTENDENT

E. M. STRAIGHT, B.S.A.

FOR THE YEAR 1929

Fall sown cereals on the Sidney Station.

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DOMINION EXPERIMENTAL STATION, SIDNEY, B.C.

REPORT OF THE SUPERINTENDENT, E. M. STRAIGHT, B.S.A.

THE SEASON

As reported last winter, the average rainfall for 11 years has been 27·77 inches. The precipitation for 1928 was considerably below the average, however, viz., 24·64. The year 1929 established a record in that the rainfall was the lowest for any year since records have been kept on Vancouver Island. As we approached the end of the year the drought remained unbroken, and the need for water for household and manufacturing purposes was constituting a problem of some magnitude. Throughout the whole district, springs that had never before failed were dry, while the extreme dryness of all land made farm operations, such as ploughing, seeding, etc., impossible in many cases. Cold, cloudy, misty weather was continued into the spring of 1929, hence seeding was late.

Hay and grain yielded well. Timothy and clover occurring in the rotations were outstanding. Some of these fields did considerably better than four tons to the acre. Wheat, fall seeded, yielded 46 bushels to the acre on the station farm, and better than that in some instances in Saanich. The fruit crop also was heavy. Apples, plums and cherries were fair. Pears, always good on Vancouver Island, outdid themselves, resulting in the heaviest crop ever harvested at the Experimental Station. As has been pointed out, the season, as it advanced, became drier and drier to the detriment of the potato and root crops. These crops were very poor and prices high. In fact the crops were very much below the needs of the island.

METEOROLOGICAL RECORDS, 1929

Month	Temperature			Precipitation	Sunshine	Possible sunshine
	High	Low	Mean			
	°F.	°F.	°F.	in.	hours	hours
January	47·0	14·0	33·0	3·17	56	273
February	49·0	19·0	34·8	1·06	117	286
March	53·0	30·0	42·2	3·03	143	370
April	66·0	28·0	45·1	1·51	217	411
May	71·0	38·0	52·6	0·77	284	473
June	77·5	42·0	58·1	1·31	232	482
July	81·0	47·0	63·5	0·24	331	486
August	83·0	46·0	62·7	0·38	314	444
September	77·0	42·0	58·5	0·71	256	377
October	68·0	39·0	51·6	1·08	142	335
November	52·0	31·0	42·3	0·94	86	276
December	51·0	31·0	39·8	4·81	48	259

7880—1½

PRECIPITATION AT SIDNEY, B.C.

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	Average 11 years
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	4·45	3·28	4·23	1·86	6·80	3·06	5·50	3·92	3·53	5·25	3·17	4·09
February	4·02	0·61	3·97	1·81	3·62	6·00	3·88	3·21	3·91	0·33	1·06	2·94
March	3·42	2·33	1·68	1·20	2·09	0·47	1·46	0·85	1·89	3·49	3·03	1·99
April	2·05	1·45	1·13	0·71	1·68	1·08	1·75	0·93	1·25	2·38	1·51	1·44
May	1·08	1·24	1·57	0·54	1·29	0·16	0·51	1·60	1·08	0·77	0·77	0·96
June	0·77	1·17	1·36	0·27	0·51	0·33	0·37	0·25	0·91	0·84	1·31	0·73
July	0·27	0·67	0·04	0·00	0·92	0·31	0·23	0·08	0·25	0·76	0·24	0·34
August	0·06	2·52	1·02	0·92	0·65	0·77	0·81	1·09	0·49	0·47	0·38	0·83
September	1·85	2·96	2·74	1·96	1·62	3·12	0·59	0·66	2·27	0·68	0·71	1·74
October	1·52	4·03	4·80	2·21	1·95	3·35	1·06	3·91	4·49	4·42	1·08	2·98
November	5·94	3·36	4·40	1·47	2·58	5·80	2·49	3·93	8·54	1·98	0·04	3·76
December	4·75	3·78	3·60	9·08	6·88	4·61	5·43	5·77	2·94	3·27	4·81	4·99

Totals

1919—30·18; 1920—27·40; 1921—30·54; 1922—22·03; 1923—30·59; 1924—29·08; 1925—24·08; 1926—26·20; 1927—31·56; 1928—24·64; 1929—18·09. Average, 11 years—26·76.

ANIMAL HUSBANDRY

The work in our live stock department has proceeded as outlined in former reports.

Live stock feeding and breeding are not carried on extensively on Vancouver island, hence Animal Husbandry has not been regarded as a major project at this Station, though considerable work has been done in this line during recent years. Dairy cattle are numerous, and among the best found in Canada. Of these the Jersey is the most popular. The mildness of the climate and other conditions, so like those found in the south of England, and on the Island of Jersey, have perhaps had much to do with popularizing this breed. The Jersey is the only breed kept at the Farm. Horses are kept for farm work only, hence little experimental work with these has been found possible. As has been pointed out in former reports, abortion has been troublesome, and has given us much concern. During the summer of 1928 it was decided to attack this problem from as many angles as possible. A barn was rented, to which all reactors to the blood test for abortion, were taken. A shed at the horse barn was utilized, in which calves from the reacting herd were reared until such time as a negative reaction was assured. Then only were they taken to the dairy barn at the Experimental Station. All of this work has interfered with our milk production and R.O.P. work very seriously. Records of "Milk Production and Value" and "Food Consumption and Cost" are included herewith, while for the "Mineral Food for Dairy Cattle"—"Minerals for Calves and Heifers and Bulls" and "Relation between Growth and Age in Dairy Cattle"—phases of work receiving attention at the Farm (see report for 1927).

MILK PRODUCTION AND VALUE

Cows completing lactation period during 1929

Name of cow	Age	Date of dropping calf	Number of days in milk	Total milk produced in period	Percentage of fat in milk	Total fat produced	Value fat when marketed	Total value of product with fat at 50 cents per pound
				lb.		lb.	$	$
Majesty's Honeymoon Bess	13	May 12–28	288	7,017·7	5·2	362·65	242 37	181 33
White Robin's Queen	7	Aug. 23–28	371	3,308·0	5·7	189·43	128 08	94 72
Aviator's Florence of V.I.S.	5	Dec. 19–28	280	3,370·0	5·6	190·38	124 33	95 19
Aviator's Queen of V.I.S.	4	Mar. 15–28	298	2,399·2	6·2	149·21	92 59	74 61
Aviator's Blossom of V.I.S.	4	May 19–28	274	6,011·1	5·8	350·58	234 90	175 29
Aviator's Honeymoon of V.I.S.	4	Mar. 22–28	299	4,774·7	5·6	267·85	171 78	133 93
Sidney Aviator Flo	3	Oct. 21–28	349	5,103·9	6·3	320·5	208 24	160 25
Sidney Aviator Cowslip	2	Jan. 2–29	337	4,782·9	6·1	291·91	189 31	145 96
Sidney Aviator Buttercup	2	Nov. 16–28	319	5,201·4	6·1	314·9	204·25	157 45
Sidney Aviator Lassie	2	Nov. 18–28	345	4,703·2	5·9	277·27	179 42	138 64
Sidney Aviator Jessie	2	Feb. 21–29	262	4,045·6	5·3	215·58	136 65	107 79
Totals	.....	.....	3,422	50,717·7	.....	2,930·26	1,911 92	1,465 16
Averages	.....	.....	311·1	4,610·7	5·8	266·39	173 81	133 20

FEED CONSUMPTION AND COST

Cows completing lactation period during 1929

Name of cow	Age	Number of days fed	Meal at $50 per ton	Roots and ensilage at $5 per ton	Hay at $20 per ton	Total cost of feed	Cost of 100 pounds of milk	Cost of 1 pound of fat	Actual profit over cost of feed
	yrs.	days	lb.	lb.	lb.	$	$	cents	$
Majesty's Honeymoon Bess.	13	288	2,952	5,600	2,880	116 60	1 66	33	125 77
White Robin's Queen	7	371	2,088	11,280	4,185	122 25	3 70	65	5 83
Aviator's Florence of V.I.S.	5	280	2,239	9,952	2,696	107 82	3 20	56	16 51
Aviator's Queen of V.I.S.	4	298	1,730	3,304	2,451	76 02	3 17	51	16 57
Aviator's Honeymoon of V.I.S.	4	299	1,888	5,070	4,122	101 10	2 12	38	70 68
Sidney Aviator Flo	3	349	2,490	11,174	3,845	128 64	2 52	40	79 60
Sidney Aviator Cowslip	2	337	2,848	11,300	3,372	133 17	2 78	46	56 14
Sidney Aviator Buttercup	2	319	2,606	10,736	3,381	125 80	2 42	40	78 45
Sidney Aviator Lassie	2	345	2,494	11,148	3,426	124 48	2 65	46	54 94
Sidney Aviator Jessie	2	262	2,144	8,000	2,332	96 92	2 40	45	39 73
Aviator's Blossom	4	274	2,108	6,322	3,902	107 53	1 78	31	127 37
Totals	.....	3,422	25,587	93,886	36,592	1,240 33	.....	.....	671 59
Averages	.....	311·1	2,326·1	8,535·1	3,326·5	112 75	2 44	42·3	61 05

As intimated, contagious abortion, with its various manifestations, has interfered with our breeding work. Control has been sought and with some measure of success, but the elimination of the difficulty has not been found possible. The best laid schemes have been nullified by abortion, perhaps nearly at the end of the project. With the assistance of Dr. T. H. Jagger, of Vancouver, and Dr. E. A. Bruce, Health of Animals Branch Laboratory, Agassiz, a series of blood tests have been made of all cattle in the herd, regardless of age or sex, during the past two years. At the beginning the tests were made every sixty days, but at present every three months. The arrangement was a very happy one—the Superintendent representing the Experimental Station, Dr. Bruce representing the Health of Animals Branch, and Dr. Jagger, an independent veterinary at Vancouver. Before the test was complete, all three parties had a part of the record, while the animal itself was known only by number to at least two concerned.

As a result of this test, all animals were classed either "positive" or "negative" and were divided, placing the positive ones in the rented barn, and the negative ones at the Station. All calves from the reacting herd were reared in a shed, and came back to the Station barn only when it was thought safe to bring them. The calves so reared were not allowed any of their mother's milk at any time.

The proof of the efficacy of this method as a diagnostic agent, with reference to infection of the bacillus abortus, will require time and should be best disclosed by the success attained in eventually raising an abortion free herd. With all reacting breeding cows removed and segregated, with the negative herd subject to periodic tests, and in contact with no cattle of unknown history, and with special care in the scheme of raising calves from reacting cows, as described, a clean junior herd should result.

At this juncture it is thought that a detailed herd history might serve no useful purpose to the reader. On the contrary, it might tend towards confusion and possibly result in unfair deductions as concerning the serological test. It may be of interest to note that beside the herd on this Farm all other herds on the Dominion Experimental Farm system are now subjected to the serological, or blood test. The results obtained in this way from a large number of cattle, under control, should make possible reliable deductions over a period of time.

A complete history of each animal is recorded, forming a chapter of considerable interest to the breeder of live-stock and of great value to the dairyman. All this is available and will be presented in due course.

With the maintenance of a reacting and a non-reacting herd, the Station has had an excellent opportunity to view the whole matter from many angles. Physical examinations (as with reference to ovarian and uterine conditions) have been made from time to time by Dr. Jagger. The laboratory report on the blood samples as made by Dr. Bruce, together with the actual history of the case, as presented to us day by day, has indicated that the condition known as cystic ovaries, one cause of sterility in cattle, has no connection with abortion in so far as B. abortus infection is concerned.

During the past few years, artichokes have been used in the form of ensilage for cattle feeding on the southern end of Vancouver Island, while the tubers have been used in place of mangels. Considerable work was done at the Station along cultural lines to determine the relative value of artichokes, sunflowers, corn, etc., so far as yield, dry matter, and chemical analysis were concerned. From all these standpoints artichokes have stood high. There remained the matter of palatability, digestibility and value as a milk producer in practical feeding work, the ultimate test of any feed in the dairy herd. Consequently the cows at the Farm were subjected to such test for three periods during the winter of 1928, first with wheat, oats and vetch mixture, second with artichokes and third with the wheat, oats and vetch as used in the beginning. Mangels were used in the first and third periods, replaced with artichoke tubers in the second. Thus when artichoke ensilage was being fed artichoke tubers took the place of roots in the ration. Many factors such as weather, decline of milk flow always observed when changes are made, etc., enter into the problem and are not always duly considered. On the one year's work it has been thought unwise to submit definite figures. In a word it would seem that the artichokes did not demonstrate their value as being on a par with wheat-oat-vetch ensilage and mangels, but a period of very bad weather, no doubt had something to do with results. Work is being continued this winter, when we hope to show the merit or demerit of artichokes as feed for dairy animals.

FIELD HUSBANDRY

A detailed record of the character of the growing season 1929 at this Station will be found in the section on "The Season" at the beginning of the report. Hay and grain crops gave yields above the average. Roots did not do so well as usual, due to the lack of rainfall during the late summer and early autumn. Corn yields were also affected by the drought. When considering "cost of production" and "profit and loss" columns the high price of land should not be lost sight of—rental charge being $32.66 per acre. This figure includes taxes.

ROTATION A—THREE YEAR'S DURATION

Wheat (winter).
Timothy and clover hay.
Roots (manured).

The wheat is usually sown about the first week of October at the rate of two bushels per acre. The timothy is also sown at this time, using the grass seeder attached to the drill. Six pounds of seed per acre is the amount sown. In February ten pounds of red clover and four pounds of alsike are sown broadcast with a hand seeder.

SUMMARY OF YIELDS, VALUE AND PROFIT OR LOSS PER ACRE

Crop	Year	Yield per acre	Value	Cost of production	Profit or loss per acre
			$	$	$
Wheat, Sun	1922	38 bush.	93 80	66 43	Profit 27 37
Timothy and clover hay	1923	3·32 tons	83 00	56 69	Profit 26 31
Summer-fallow	1924	.....	.....	45 65	Loss 45 65
Wheat, Sun	1925	42·18 bush.	108 47	54 79	Profit 53 68
Timothy and clover	1926	3·0 tons	60 00	52 19	Profit 7 81
Potatoes, Sir Walter Raleigh	1927	9·23 tons	230 75	124 41	Profit 106 34
Wheat, Bluestem	1928	37·0 bush.	69 95	62 00	Profit 7 95
Timothy and clover	1929	4·08 tons	89 76	57 81	Profit 31 95

Owing to the unfavourable weather conditions in 1924, summer-fallow replaced the roots in the rotation, and the cost of operations entered as a loss. The average yield of wheat per acre, for a three-year period on the area was 39·06 bushels. The potatoes cost $13.48 per ton to produce. In 1928 spring wheat replaced winter wheat. This was necessary due to the late harvest of the potatoes and the heavy rains during the fall of 1927 preventing ploughing and preparation of soil. The yield of over four tons of hay per acre obtained this year is the largest recorded at this station and can be put down to the favourable season and the increased fertility of the soil in the area, acquired by ploughing in the second growth of clover, and the application of ten tons of barnyard manure every third year. The average production of hay for a period of three years was 3·47 tons.

ROTATION B—FOUR YEAR'S DURATION

Wheat, winter.
Peas.
Corn (manured).
Wheat, oats and vetch (ensilage).

SUMMARY OF YIELDS—VALUE AND PROFIT OR LOSS PER ACRE

Crop	Year	Yield per acre	Value	Cost of production	Profit or loss per acre
			$	$	$
Wheat, Sun	1923	25·2 bush.	84 86	67 10	Profit 17 76
Peas, Maple	1924	22·0 bush.	59 70	68 34	Loss 8 64
Corn, Longfellow	1925	7·16 tons	42 96	86 69	Loss 43 73
Wheat, oats, and vetch	1926	11·93 tons	79 45	81 64	Loss 2 19
Wheat, Sun	1927	42·0 bush.	88 52	62 29	Profit 26 24
Peas, Maple	1928	26·0 bush.	96 46	62 77	Profit 33 69
Corn, Longfellow	1929	9·22 tons	67 67	79 91	Loss 12 24

A great disadvantage in this rotation is that wheat follows wheat, oats and vetch, and cannot be kept free from vetch, as the vetch has a tendency to shatter when harvested; also the second growth of this plant often ripens seed which is distributed during the preparation of the soil for the wheat.

The cost of producing corn per ton in 1925 was $12.11 and in 1929, $8.67.

ROTATION C—FIVE YEAR'S DURATION

Vetch.
Corn.
Peas.
Wheat.
Timothy or rye grass.

SUMMARY OF YIELDS—VALUE AND PROFIT OR LOSS PER ACRE

Crop	Year	Yield per acre	Value	Cost of production	Profit or loss per acre
			$	$	$
Vetch, common spring	1923	16·7 bush.	83 62	73 20	Profit 10 42
Corn, Longfellow	1924	9·69 tons	58 14	99 59	Loss 41 45
Peas, Maple	1925	27·0 bush.	73 20	66 87	Profit 6 33
Oats, replacing wheat	1926	34·0 bush.	34 23	60 30	Loss 26 07
Peas and oats, replacing timothy	1927	2·20 tons	50 60	51 98	Loss 1 38
Vetch	1928	10·8 bush.	49 51	59 07	Loss 9 55
Corn, Longfellow	1929	8·75 tons	64 22	80 41	Loss 16 19

Rotation C is conducted on an area of two acres, the soil changing from a heavy clay to a light gravelly loam. Oats replaced wheat in this rotation in 1926, weather conditions preventing the preparation of the soil the previous fall. Peas and oats were used in place of timothy, it being too late to sow the timothy in the spring of 1926.

ROTATION D, FOUR YEAR'S DURATION

Winter wheat.
Timothy and clover hay.
Roots.
Peas.

SUMMARY OF YIELDS—VALUE AND PROFIT OR LOSS PER ACRE

Crop	Year	Yield per acre	Value	Cost of production	Profit or loss per acre
			$	$	$
Wheat, Red Rock	1923	26·3 bush.	85 31	67 25	Profit 18 06
Timothy and clover	1924	2·05 tons	49 20	53 64	Loss 4 44
Mangels	1925	12·13 tons	121 30	112 37	Profit 8 93
Peas	1926	20·0 bush.	45 34	61 75	Loss 16 41
Wheat, Red Rock	1927	33·25 bush.	77 04	73 73	Profit 3 31
Timothy and clover	1928	2·51 tons	57 73	49 71	Profit 8 02
Potatoes, Irish Cobbler	1929	5·34 tons	320 40	127 41	Profit 192 99

The price of potatoes at harvest time in 1929 was $60 per ton, wholesale. The price was responsible for the large profit per acre.

ROTATION E, FOUR YEAR'S DURATION

Wheat, oats and vetch.
Potatoes.
Oats.
Hay.

In future Kanota Oats, a winter variety, will replace the spring oats in this rotation.

SUMMARY OF YIELDS—VALUE AND PROFIT OR LOSS PER ACRE

Crop	Year	Yield per acre	Value	Cost of production	Profit or loss per acre
			$	$	$
Wheat, oats and vetch	1924	2·69 tons	61 87	63 38	Loss 1 51
Potatoes	1925	4·39 tons	131 70	137 61	Loss 5 91
Oats	1926	51·0 bush.	55 70	57 57	Loss 1 67
Timothy and clover	1927	2·83 tons	65 09	51 91	Profit 13 18
Wheat, oats and vetch	1928	8·69 tons	85 42	70 91	Profit 14 51
Summer-fallow	1929	.....	.....	42 51	

The wheat, oats and vetch were cut and cured for hay in 1924. This area was summer-fallowed in 1929 to keep down the Canadian thistles which had spread considerably during late years. The cost of summer-fallow will be spread equally over the next three years, charging $14.17 to the cost of production of each crop grown during this period.

DATE OF SEEDING GRAIN CROPS, WHEAT, BARLEY, OATS

This experiment was started in the autumn of 1926. The object was to ascertain the best time to sow winter cereals. Plots of equal size were sown under field conditions one week apart, commencing on September 21 and ending November 2.

DATE OF SEEDING WINTER WHEAT

Plot	Date of seeding	Per cent winter killed	Date ripe	Height when cut	Yield per acre 1929		Average yield for three years	
					Grain	Straw	Grain	Straw
				in.	bush.	tons	bush.	tons
1	Sept. 21	Nil	Aug. 3	43	42·5	2·34	36·7	3·08
2	Sept. 28	Nil	Aug. 3	46	45·0	2·48	40·5	2·74
3	Aug. 5	Nil	Aug. 3	45	46·6	2·29	40·5	2·36
4	Oct. 12	Nil	Aug. 8	42	41·6	2·02	43·3	2·56
5	Oct. 19	Nil	Aug. 8	40	33·3	1·50	43·2	2·46
6	Oct. 26	Nil	Aug. 8	40	25·0	1·35	39·3	2·26
7	Nov. 2	5 to 10%	Aug. 8	36	18·3	1·06	38·9	1·90

Game birds destroyed a considerable amount of young seedlings in plots 5, 6 and 7.

Sun wheat was used in the experiment.

The above figures would indicate that the best time to sow wheat is the middle of October.

DATE OF SEEDING OATS

Plot	Date of seeding	Per cent winter killed	Date ripe	Height when cut	Yield per acre 1929		Average yield for three years	
					Grain	Straw	Grain	Straw
				in.	bush.	tons	bush.	tons
1	Sept. 21	Nil	July 4	43	56·6	2·30	56·5	2·73
2	Sept. 28	Nil	July 4	46	61·7	2·35	54·8	2·47
3	Oct. 5	Nil	July 4	45	54·4	2·10	42·7	1·77
4	Oct. 12	10	July 4	40	47·0	1·90	38·2	1·62
5	Oct. 19	35	July 8	40	41·1	1·92	32·4	1·42
6	Oct. 26	60	July 8	40	27·9	1·20	24·7	1·19
7	Nov. 2	65	July 8	36	21·3	0·85	21·3	1·00

To obtain the best results from winter oats it is necessary to sow early, just as soon as there is enough moisture in the soil to germinate the seed. The average column of both grain and straw, for the past three years, shows a steady decline in yields as the date of seeding advances.

DATE OF SEEDING BARLEY

Plot	Date of seeding	Per cent winter killed	Date ripe	Height when cut	Yield per acre 1929		Average yield for three years	
					Grain	Straw	Grain	Straw
				in.	bush.	tons	bush.	tons
1	Sept. 21	Nil	July 12	40	58·3	2·92	46·5	2·87
2	Sept. 28	Nil	July 12	43	59·8	2·50	50·4	2·74
3	Oct. 5	Nil	July 12	39	56·2	2·45	48·3	2·51
4	Oct. 12	Nil	July 12	36	55·4	1·92	50·8	2·54
5	Oct. 19	10	July 15	32	46·6	1·54	46·0	2·27
6	Oct. 26	15	July 15	33	35·7	1·36	34·7	1·97
7	Nov. 2	20	July 15	32	30·6	1·13	30·0	1·74

From the above table it will be noticed that barley does best when seeded early, the last week in September and the first two weeks in October giving the best results.

COMPARATIVE YIELDS OF CORN, SUNFLOWER, ARTICHOKE STEMS, WHEAT, OATS AND VETCH

Plots of one-third of an acre were used for this work. On October 3, 1928, a mixture of thirty pounds of Sun wheat, forty pounds of Kanota oats and fifty pounds of common spring vetch was sown at the rate of two bushels per acre. Artichokes were planted on April 26. The tubers were set in rows four feet apart and three feet apart in the row. The corn and sunflowers were sown on May 21 in rows three feet apart and thinned to twelve inches in the row. Longfellow corn and Giant sunflowers were used for this test.

COMPARATIVE YIELDS

Crop	Date of harvest	Per cent dry matter	Yield per acre 1929		Average yield for three years	
			Green weight	Dry matter	Green weight	Dry matter
			tons	tons	tons	tons
Wheat, oats and vetch	July 5	30·05	9·33	2·80	9·67	3·47
Sunflowers	Sept. 26	19·51	17·60	3·43	16·04	3·19
Corn	Sept. 25	23·97	11·33	2·71	11·32	2·34
Artichokes	Oct. 30	29·15	18·71	5·45	*21·78	*6·17

*Average for two years only.

HORTICULTURE

TREE FRUITS

The Experimental Station for Vancouver Island at Sidney has, since its inception, paid especial attention to the culture of tree fruits. No effort has been spared in obtaining reliable information on cultural methods, varieties, and yields of the many crops over a period of years. Tests are conducted with pears, cherries, plums, apples, in the main section of the orchard, while many other fruits of lesser importance are under test in order to ascertain just what importance should be attached to them under Vancouver Island conditions.

Systematic spraying of all fruit trees has kept them remarkably free from insect pests and disease. Pear scab, though prevalent in the 1927 and 1928 crops, was reduced to a minimum during the past year through the application of special sprays.

Practically no winter-killing has occurred with the common fruits at any time. The trees came through the winter of 1929 in good condition and showed a wealth of bloom. This condition with bright sunny weather throughout the blossoming period ensured a heavy set of fruit.

As usual, fall wheat was seeded throughout the entire orchard in October and ploughed down in April. Clean cultivation, as always, was practised throughout the summer months.

During the seven year period ending 1928, a series of fertilizer tests was conducted in the apple and pear sections of the orchard, with a view of ascertaining the effect of the various fertilizers on growth and also on the yield of fruit. As a result of these investigations, and acting on the truth determined, a fairly heavy dressing of nitrate of soda was applied in the early season of 1929, the effect of which was felt generally over the entire orchard.

A detailed record as to the behaviour of each tree in the orchard gives much valuable information. These data include general conditions, season's growth, date of blooming, quality of fruit, dates of picking, amount of fruit picked, etc. Recommendations as to varieties to grow are based on such information obtained over a period of years.

APPLES—VARIETY EXPERIMENT

Forty-one varieties have been tested and reported on from year to year, having in mind the determination of the most suitable varieties for Vancouver Island. The crop harvested during the past season has been one of the best in many years, the fruit being clean and of good quality. The following varieties have done remarkably well and are recommended for planting: Yellow Transparent, Melba, McIntosh Red, King of Tompkins, Grimes Golden, Wagener and Winter Banana.

CHERRIES—VARIETY EXPERIMENT

Both sweet and sour varieties do well at this station. The sweet cherry, though somewhat uncertain in many parts of Canada, does well here; is absolutely hardy, does not suffer seriously from gummosis and the fruit finds a ready market. Many of the varieties tested cannot be recommended for general planting. The Bing is the most popular variety of this type, but has to be interplanted with some good pollenizing variety, such as the Black Tartarian, or Deacon in order to ensure a set of fruit. Records covering fifteen years work with thirty-four varieties of sweet cherries would show that the best varieties for this area are Elton, Windsor, Royal Anne, Bing and Lambert. The best sour cherries are Olivet (semi-sour), Montmorency, and Morello.

PEARS—VARIETY EXPERIMENT

The pear is probably the most reliable and regular cropper of the tree fruits grown here. The climate and soil conditions found in the coast regions seem to suit this fruit very well. Trees are thrifty and clean, though the fruit is somewhat subject to scab during certain seasons. This loss from disease can be reduced greatly by attention to spraying. Part of the pear orchard was planted in 1914 to varieties on dwarf stock, while the remainder and larger portion was on standard stock. Varieties were duplicated in both blocks and records kept as to growth of trees and yields of fruit. Yields have been in favour of the standard stocks, though in many cases there is little to choose between tress on dwarf and standard stocks, either in amount of growth or yield of fruit. Some fifty varieties of pears, covering a wide range of season, have been under test. From results obtained the following varieties are recommended for planting: Bartlett, Bosc, Clairgeau and Anjou.

PEAR POLLINATION

Whether leading pear varieties are self fertile, or whether they require other varieties to pollinate them is a question that is arousing much interest on the part of the growers. If not wholly self fertile to what extent are they so? In commercial plantings, where the number of profitable varieties to grow would necessarily be limited, a knowledge of the degree of fertility or sterility of each would seem to be of prime importance.

Investigational work seeking an answer to these questions has been started during the past year. Some fifty varieties are grown at this station so it will be seen that every facility is offered under natural conditions to ensure a set of fruit. Portions of trees of each variety were caged during the blooming season and the set of fruit noted.

The expression "normal set" is used in designating the percentage of fruit which the tree sets under normal conditions when left open to insect pollination. The term "self" indicates the percentage of fruit set from self-pollination.

The following table sets forth the data obtained:—

Pollination of Pear Varieties

	Variety	Per cent set	
		Self	Normal
1	Anjou	.....	2·4
2	Beurré d'Amanlis	.....	18·2
3	Beurré Hardy	.....	13·3
4	Beurré Diel	.....	18·8
5	Crocker Bartlett	.....	17·3
6	Doyenné d'Aleçon	.....	2·7
7	Doyenné de Comice	.....	14·7
8	Glou Morceau	.....	41·2
9	Louise Bonne de Jersey	.....	16·8
10	Madame Baltet	.....	11·2
11	Madame Ernest Baltet	.....	24·1
12	Passe Crassane	.....	8·8
13	Pitmaston Duchess	.....	15·5
14	Princess	.....	4·2
15	Royale Vendeé	.....	60·0
16	Souvenir de Congress	.....	25·5
17	Triomphe de Vienne	.....	2·3
18	Virginie Baltet	.....	35·2
19	Vicar of Winkfield	.....	28·0
20	Winter Nelis	.....	17·6
21	Koonce	0·6	30·1
22	Forelle	0·5	25·0
23	Barry	1·2	35·9
24	Le Lectier	0·5	10·3

POLLINATION OF PEAR VARIETIES—*Concluded*

	Variety	Per cent set	
		Self	Normal
25	Charles Ernest	1·4	17·7
26	Boussock	1·1	13·9
27	Worden Seckel	0·9	15·0
28	Clairgeau	0·9	14·1
29	Howell	1·0	14·3
30	Easter Beurré	0·6	7·2
31	Jargonelle	3·0	36·3
32	Seckel	3·7	38·3
33	Clapp Favourite	3·5	24·6
34	Flemish Beauty	3·0	20·0
35	Besi de Chaumontel	6·4	30·0
36	Bosc	16·5	76·0
37	Fondante Thirriot	5·7	22·7
38	Marguerite Marillat	12·5	42·7
39	Winter Bartlett	12·3	41·8
40	Belle Lucrative	11·0	37·2
41	Wilder Early	5·8	18·6
42	Nouvelle Fulvie	8·3	25·7
43	Emile d'Heyst	5·7	17·3
44	Rosseney	16·4	43·6
45	Beurré d'Arvil	6·5	17·7
46	President Deviolaine	0·6	1·2
47	Duchess	4·5	10·0
48	Beurré Bachelier	19·4	26·0
49	Bartlett	22·1	14·3
50	Dr. Jules Guyot	43·8	33·0

No attempt is being made to draw definite conclusions from one season's work. However, it will be noted that the first twenty varieties listed did not set fruits of themselves when all foreign pollen was excluded. While self-fertile varieties may be expected to produce good crops without pollinizers, it will be noted from the table that only in the case of Bartlett and Dr. Jules Guyot did the self-pollination equal the normal set. The advantage of cross pollination is thus indicated, since the trees are located in a variety orchard where abundant opportunity for cross pollination is afforded.

PLUMS—VARIETY EXPERIMENT

Planted in the spring of 1914, the plum orchard consists of 160 trees covering 45 varieties of plums and prunes. Trees are for the most part healthy, however, those of a few varieties are not making the growth naturally to be expected. Dormant and calyx sprays are applied each year, keeping insect pests and diseases under control. Blossom blight, a disease which attacks the bloom, reducing it to a brownish dead mass, causes much loss with several varieties. Brown rot of a stone fruit is present each year, but has not been as troublesome in plums as in cherries and peaches. The market for plums has been very good for early varieties of good quality, but in later season even excellent varieties have brought rather disappointing returns during the past few years. Some of the best varieties for planting in order of season are: Peach, Early Gold, Mallard, Washington, Pond Seedling, and Victoria. Of the prunes, while the Italian is of excellent quality, it is a poor yielder at this station. The Sugar prune is a good yielder and is also of high quality.

PEACHES—VARIETY EXPERIMENT

This fruit has been grown under orchard conditions for the past fourteen years. The location has an eastern exposure on high, well-drained soil. One or more trees of fourteen varieties have been tested during the period, and

for the most part trees are thrifty and hardy. Early spring frosts have been the chief cause of low yields of fruit. Leaf curl is very troublesome; in many cases practically defoliating the tree for the time being. Brown rot, usually not severe, causes considerable loss on a few varieties, the Triumph being the most susceptible. While yields in some cases are quite satisfactory under orchard conditions, still with yield and quality considered, commercial plantings of peaches cannot be recommended. On a wall or side of a building excellent results may be obtained, supplying the needs of the home. Varieties recommended are Hale Early, Alexander, Early Crawford, and Rochester.

NECTARINE—VARIETY EXPERIMENT

Planted in 1914, many varieties, including Boston, Stanwick, Lord Napier, Early Newington, and Early Violet, have been tested along with peaches. The nectarine is a smooth-skinned peach. It has been known for nectarines to come from the seed of peaches, and likewise peaches from the seeds of nectarines. The cultivation of nectarine is in all ways like that of a peach. It is less popular in the markets than the peach, hence is less grown, although in California it is planted on a commercial scale. Nectarines are usually inferior to peaches in quality, probably because less attention has been paid to the breeding and selection of varieties. Varieties are few as compared to peaches and the fruit varies in shape, size, colour, and flavour, as does the fruit of the peach. The nectarine cannot be recommended over the peach in any way, hence it has but little value here. Grown on the wall of a building, a fair quality of fruit results.

APRICOT—VARIETY EXPERIMENT

This fruit has been grown at this station since 1914, when plantings included such varieties as the Moorpark, Tilton, Royal, Sucre de Holub, Superb, and Paviot. While the tree itself is supposed to be as hardy as that of the peach, it has never done so well here. The apricot is particularly disturbed with wet feet, and many of the failures may be due to a too retentive subsoil. Under these conditions the trees die in a few years. Late spring frosts, too, is one cause of low yields, and it would seem that the apricot could not be considered even for garden planting unless a particularly well-suited location presents itself.

QUINCE—VARIETY EXPERIMENT

Some eight varieties were planted in 1914, six of these coming from Baltet Bros., France, and two from a local nursery. Two of the French varieties, de Portugal and de Borgeant, have outyielded all others by a wide margin. Few fruits have played a more important part in ancient history than the quince, and yet there is scarcely a fruit with equal or poorer merit that has not received more attention during recent years. Scarcely any reference as to the value of this fruit, its merits or culture, is ever made in the Experimental Station literature of America. Perhaps this is due to the fact that the fruit can hardly be considered in the dessert class except when cooked. In spite of this, quince on the local market, Victoria, frequently retails at 15 cents per pound. The fruit is used largely in the making of marmalade, preserves, jellies, and for flavouring purposes. However, the market is limited, and while a good price is obtained at present for the fruit, such might not be the case if more plantings were made. There is no doubt a place in many home gardens for a tree of this fruit. The trees are hardy and yield well.

MEDLARS—VARIETY EXPERIMENT

Grown to a considerable extent in Europe for its acid fruits, the Medlar is absolutely hardy here. The fruit is little known and has little to recommend

it to the public. Remaining hard until mellowed by frosts, it is then put into storage until decay reduces the fruit to a brown soft pulp. When finally softened, it is agreeable for eating from the hand, for those who enjoy this class of fruit. Of four varieties under test since 1914, Ordinaire has given by far the heaviest yields. There is little demand, however, for this fruit on the Coast and its culture cannot be recommended.

NUTS

WALNUTS VARIETY EXPERIMENT

The area given over to walnut culture consists of five acres of what is commonly called "red land" with an eastern exposure. In 1915 trees of eighteen grafted varieties and many seedlings of *Juglans regia* were planted. For the most part these trees have done well. Growth, while not large, has been satisfactory considering the soil conditions, and the trees themselves are in a thrifty condition. Nuts have been produced in quantity for several years; a substantial increase in crop being recorded each year. The following table presents the yields obtained during the past three years.

WALNUTS—VARIETY EXPERIMENT

Variety	Number of trees	Date of planting	Total yield per tree for 3 years 1927–29	
			lb.	oz.
Ordinaire	4	1916	44	10
A Coque tendre	3	1916	34	12
Bijou et Gros Fruit	1	1916	26	.....
Fertile	3	1916	23	13
Franquette (Vrooman)	3	1918	23	2
Regia der Agrie	3	1917	22	1
Regia	33	1916	18	9
Franquette grafted on California Black	1	1916	18	9
Franquette	46	1917	18	8
Mayette	60	1917	13	10
Chareete	33	1917	13	10
De Terrijard	20	1917	13	10
Parisienne	36	1917	12	4
De La St. Jean	3	1916	2	14

The nuts are gathered just at the time they are falling from the trees, washed and dried. Washing at the time of gathering is much easier than after drying, when bits of leaves and dirt adhere very closely to the shell of the nuts. Bleaching then takes place. This consists of dipping in a solution of chloride of lime and sal soda to which sulphuric acid is added.

The bleaching formula, which was given out by the university of California Experimental Station, illustrates the details of the process. "Six pounds of bleaching powder (chloride of lime), twelve pounds of sal soda, fifty gallons of water. Dissolve the sal soda in about four gallons of water, dissolve the bleaching powder in about four gallons of water. Add one solution to the other and stir well. Let the carbonate of lime settle to the bottom and draw off the clear liquid and add water to make a total of fifty gallons. Put the nuts in a large dipping box or lath crate, immerse in the fluid, and then add one and one-fourth pounds of 50 per cent sulphuric acid and agitate by raising and lowering the dipping box. The bleach should be reached in five to ten seconds. The nuts are then washed in clear water and put to dry. The liquid can be used with new batches of nuts so long as the proper effect is produced and small additions of acid will prolong the efficiency of the liquor."

BLOWING VS. DIGGING HOLES IN TREE PLANTING

Much has been said and written both in favour of and against the practice of using powder in blowing holes in the planting of fruit trees. In order to determine something of the value of this practice, its effect upon growth and yield, a number of holes for tree planting were blown and checks arranged. One-half stick of stumping powder was used to a hole made by driving a crow-bar in as deeply as possible. Walnut trees two years old were planted in the regular manner in dug and blown holes. The following table presents the data obtained from similar trees.

—	Holes dug	Holes blown
Average growth per tree per year 1917–1929	10 feet 8 inches	11 feet 7 inches
Total diameter of 6 trees, 1929	34·75 inches	34·0 inches
Total yield fruit, 6 trees for 4 years	182 pounds	126 pounds

From the data presented in the above table it will be seen that there is little difference in growth, either of the main stem or laterally, between trees in holes dug and those blown. The yield as presented is in favour of the trees in dug holes.

ALMONDS—VARIETY EXPERIMENT

The almond seems to be about as hardy as the peach though shorter lived. Coming into bloom as it does in early spring it is subject to damage from late frosts, making the crop very uncertain. Several varieties were planted in the spring of 1916 but results obtained would indicate that there is little to hope for from the almond here. Of the varieties tested heaviest yields have been borne by two Texas Prolific trees. Other varieties tested are Paper Shell, Nonpareil and Jordan. The planting of the almond, with the expectations of securing any adequate returns, cannot be recommended.

FILBERTS—VARIETY EXPERIMENT

Nearly an acre of these nuts was planted in the spring of 1915, most of which consisted of grafted varieties—twenty-six in all. Growth has been very satisfactory. Planting was done in rows 18 feet apart and trees about 12 feet apart. Trees are headed about 18 feet from the ground and while some pruning is done, to maintain the shape of the tree, for the most part they have been allowed to assume a semi-bush form. Growing a number of varieties in the same area seems to be the solution of the problem of pollination. In many cases catkins or staminate flowers ripen their pollen before the pistillate flowers are ready to receive it, hence fertilization in such case depends on pollen from other sources reaching the pistillate flowers. In cases where seedling plants are grown this difficulty adjusts itself, as usually there is considerable variation in blooming periods between the seedlings. While yields are satisfactory much loss is experienced through the pilfering by blue jays. No remedy has been found for this difficulty though many have been tried. On the varieties tested the following are recommended: Fertile de Coutard, Red Hazel, Kentish Cob, Gosford and Merveille de Bollwiller.

OTHER FRUITS

FIGS—VARIETY EXPERIMENT

Twenty varieties of figs were planted in 1914. While satisfactory growth has been made, considerable winter killing has taken place during some seasons. Although the fig is a heat loving fruit, it will stand a little frost. Some of the

varieties have borne fruit of good quality while others have failed entirely. Those which have done the best are: Doree, Ladero, Dauphine, California Black and Ronde Noir. This fruit, however, cannot be recommended for planting.

GRAPE—VARIETY EXPERIMENT

The first plantings of this fruit were made at this station in 1915 when some eighteen varieties were put under test. Many of these varieties were found to have little or no value grown out of doors, due to the long slow process of ripening under Vancouver Island conditions. However, a few varieties have shown worth, producing a good quality of fruit and in amounts to give them considerable value. In the latter class are varieties such as Vergennes, Campbell Early, Hartford, Winchell and Moore Early. Recent plantings have been made of Island Belle, a new variety similar in many respects to Campbell Early and one that promises to suit the climatic conditions. Several of the newer varieties received from Ottawa for trial in 1921 are very promising and include Craig, Early Daisy, Lincoln (Reed Hybrid) and Wilkins.

GRAPES—GROWING AND TRAINING

Through the successful production of wine from the Loganberry a wine industry of considerable proportions has developed on the southern portion of the Island. Along with the sudden rise of the Loganberry in popular favour, some attention also has been focused upon the grape as a source of wine. With this in mind, grape vines have been freely planted during the past two years throughout the Saanich Peninsula, and in view of this it is thought that some information concerning the growing and training of grapes, obtained from experience at this station and other sources, would be appreciated.

Grapes are grown on a great variety of soils and in various locations, but do best in warm well drained location and should be planted where they will get full sunlight. Planting must be carefully done in a soil that has been well prepared.

New vines are grown from cuttings of one year old dormant wood. These cuttings should be about eight or ten inches long, and rooted in a nursery row or cold frame where they are left for one year until the root system is well established.

In no crop does pruning play so important a part both as regards the quality of the fruit and the cost of production, as the grape. Certain systems of pruning require a large expenditure of money in the construction of supports or trellises, and a considerable outlay each season in labour for tying both in early season and during the summer. Other systems require less expenditure in time, labour and materials and yet produce a good quality of fruit.

At this station the Double Kniffin system of training has been used with very satisfactory results. One year old plants are best for planting regardless of whatever system is used. At time of planting remove all broken and damaged roots and cut the top back from two or four buds. The vines are planted in rows ten feet apart and about ten feet apart in the row.

Fig. 1 and fig. 2 indicate the Single and Double Kniffin System. The long trunks employed carry the fruiting branches far above the ground permitting the annual growth to fall from the supporting vines in a natural way without the necessity of tying. This constitutes the chief advantage of this system over the High-Renewal as shown in fig. 3.

KNIFFIN SYSTEM.—This consists in carrying one or two main trunks to the height of from three to five feet above the ground. When using the double system which is the one recommended, the top wire should be five feet or more above the ground with the other wire about twenty inches lower (Fig. 2). It is not desirable to attempt to make the two stories on a single trunk, as the growth induces development at the extremity of the canes, and therefore the set of branches which is lowest upon a common trunk makes comparatively little growth. When two trunks are used the case is different, as each set of branches become terminal branches and growth is more evenly distributed.

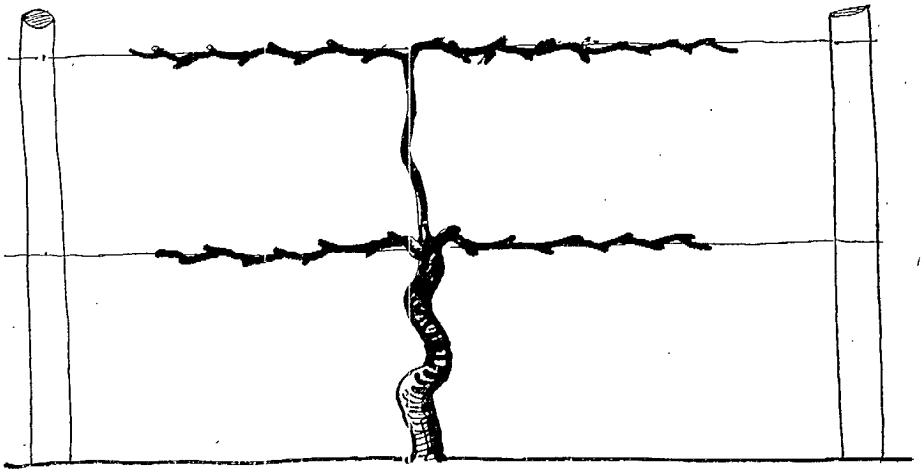


FIG. 1.—Single Kniffin system.

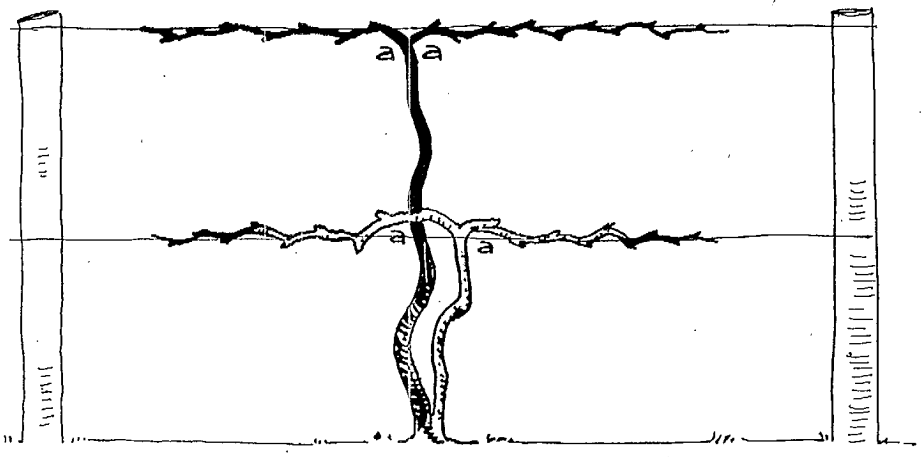


FIG. 2.—Double Kniffin system.

At planting, the vine is set to three or four buds and the two strongest allowed to grow. The canes arising from these buds should be staked and tied during the season. In the second spring, before growth starts, these canes should be shortened back to the first wire where they will form part of the main trunks; one will be allowed to grow to the top wire while the other will be trained right

and left on the lower wire. These branches will be pruned to five feet each way if the vines are ten feet apart. On these horizontal branches the fruiting canes will be borne. All fruit is borne on the wood of the present season which arises from the wood of the previous season's growth.

In pruning a cane that has borne two or three bunches of grapes during the past season, cut back to two buds, these being left to supply the shoots for the

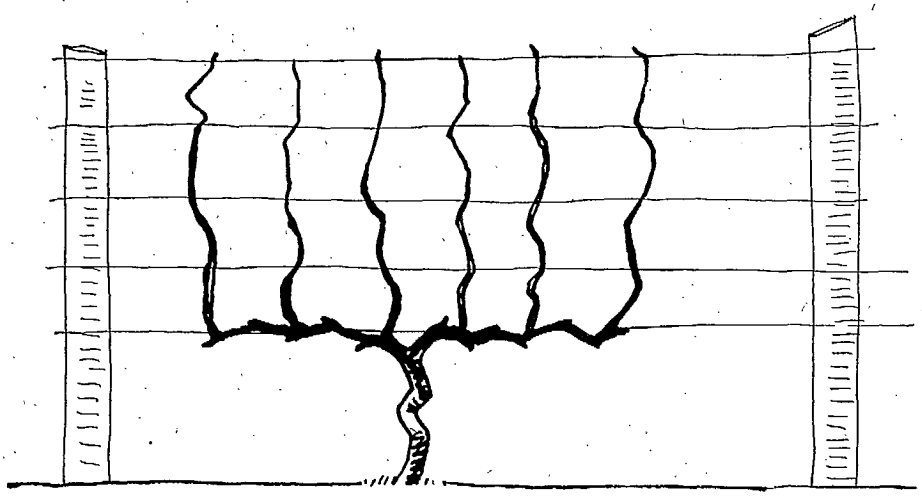


FIG. 3.—High renewal system.

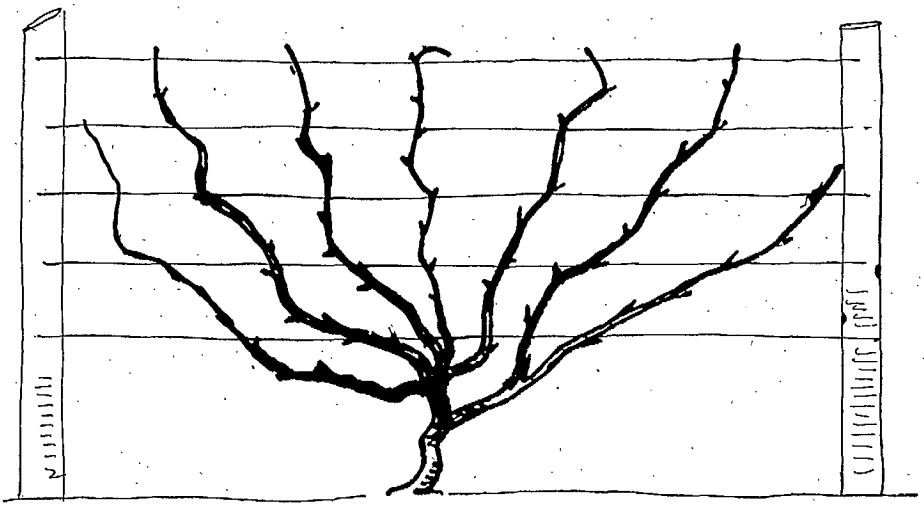


FIG. 4.—Fan system.

succeeding year. This short branch is now called a spur (Fig. 5). In the spring these buds will grow and the weaker ones will be discarded; the fruiting cane growing from the strong bud that has been left, as in the previous year. Thus the spur becomes more elongated each year developing into a stubby branch. As this occurs the grower must endeavour to bring out from time to time new canes which spring from the main stem.

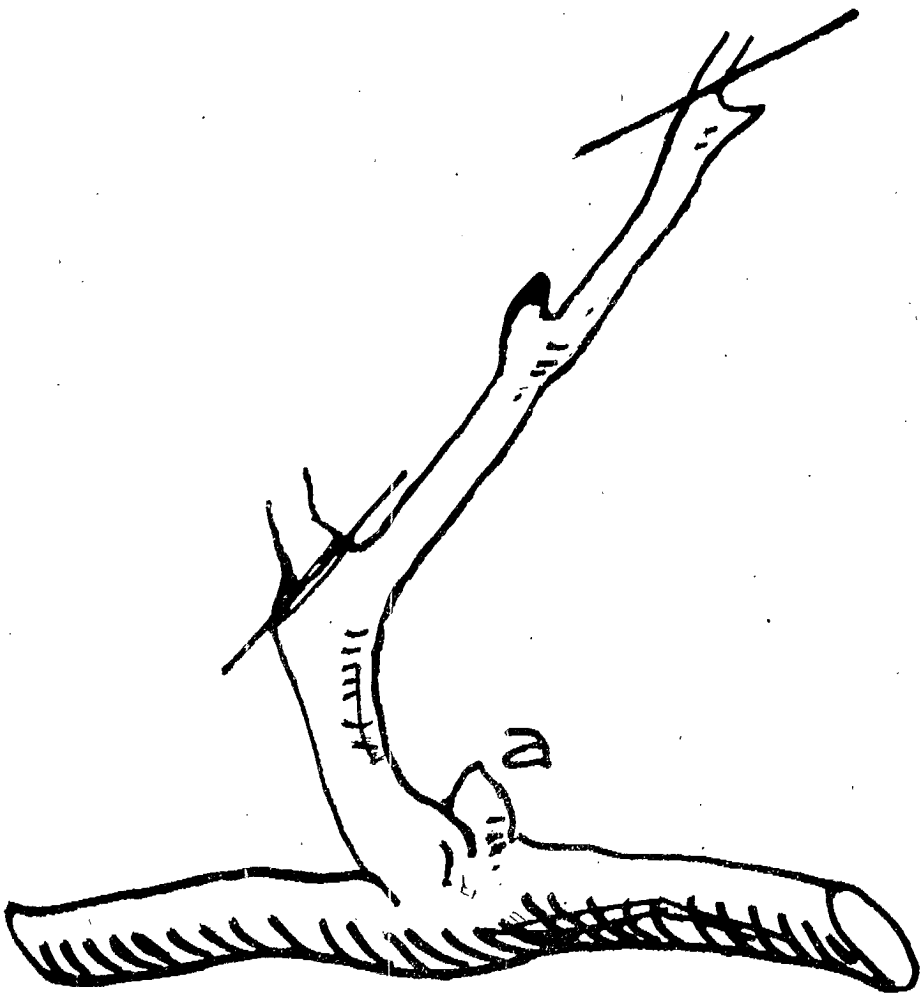


FIG. 5—Method of spur pruning.

The horizontal branches should bear satisfactorily, if this plan has been carefully carried out, for from ten to fifteen years, after which it will be found advisable to renew them. In doing this cut back to the main trunk as indicated in Fig. 2A as soon as a strong vigorous cane has been established from this point.

HIGH RENEWAL SYSTEM.—This system requires a trellis consisting of three or more wires, the first or lowest wire being about twenty inches above the ground and the others placed above at intervals of eighteen inches until the desired height is attained. The main trunk of the vine is carried to the lowest wire where it branches in either direction for five feet, and from these horizontal arms the fruiting canes are trained in an upright position as shown in Fig. 3 and tied to the wires.

FAN SYSTEM.—This is a very popular system and used extensively in grape growing districts where the vines have to be taken down and covered during the winter season for protection. From four to six arms come out more or less fan-shaped from a main and the canes growing from them are pruned back

to stubs each year. As these become elongated they will need renewing back to the main stem. The chief thing to keep in mind is that the fruit is borne on the new shoots from the previous year's wood and that the vines are pruned to encourage development of good wood again and to ensure well developed bunches of grapes.

THERMOGEN—THE PAPER MULCH

The Experimental Station for a number of years has conducted experiments with Thermogen, the paper mulch. In the report of 1928 we said: "For two years Thermogen (a paper mulch) was tried out on beans and garden peas as green vegetable crops with slightly increased yields being obtained through its use. Hence for these crops the conclusion was drawn that Thermogen had little value and that the cost made the use of it prohibitive. During the 1928 season muskmelons were planted grown with paper. A plot kept under clean cultivation was grown beside the paper mulch plot, the plants being the same variety and set out in a similar manner. Results obtained would show a marked increase in yield in favour of the paper mulch. The plants did better from the date of planting and surpassed those in the check plot at all stages. Further work will be carried out during the next year with Thermogen, when it will be tested with other crops as well."

During 1929 considerable time was given the project to determine the merit or demerit of the paper much with a great series of garden crops. The details of the project would take considerable time but a few features may be noted.

1. Plots were all in duplicate.
2. The size of each plot was thirty lineal feet, hence figures are based on sixty lineal feet under paper, and sixty lineal feet without paper.

Cucumbers. Left—mulch paper. Right—no mulch paper.

3. Beans were planted in rows 37 inches apart and thinned to four inches apart in the row. Half of each variety, viz: Round Pod Kidney Wax and Stringless Green Pod were picked green, while the remaining half were left to ripen and weight of dry beans taken.

4. Beets, Detroit Dark Red, were sown in rows 37 inches apart. All beets on fifteen feet of each plot were pulled when fit to bunch, and the remaining fifteen feet left until autumn when number and weight were recorded.

5. Cabbage, Golden Acre, were planted eighteen inches apart in rows spaced 37 inches. Notes were taken on disease and insects.

6. Carrots, Chantenay, were thinned to 2 inches apart in rows spaced 37 inches. As in the case of beets records were kept of yield in bunches and total yield at end of season.

7. Cauliflower, Snowball. Plants 18 inches apart in row. Rows 37 inches apart. Insects and disease were also noted.

8. Celery, Golden Plume. Planted six inches apart in rows, 37 inches apart. Blanching to be accomplished by boards. Weight of average plants taken at end of season.

9. Corn, Golden Bantam. Rows 37 inches apart, thinned to 8 inches apart in row. Height, vigour and total of marketable and unmarketable ears to be kept in each instance.

10. Cucumbers, egg plants, lettuce, musk-melons, onions, peppers, potatoes and tomatoes were treated in similar manner, but with such slight changes as the nature of the crop would seem to demand.

Summary of results in tabular form is presented.

ONIONS—YELLOW GLOBE DANVERS

Thirty feet of row thinned to one inch apart. Rows nineteen inches apart.

—	Date sown	Date germ.	Date when ready	Per cent of maggot	Per cent of thick neck	Weight of crop over 2 inches diam.	Weight under 2 inches diam.	Total weight
						lb.	lb.	lb.
With paper.....	April 25	May 8	Sept. 10	Nil	Nil	16	9	25
Without paper.....	" 25	" 8	" 5	"	"	5	9	14

The table shows that of onions over 2 inches in diameter the paper increased the crop three times, and almost doubled the total yield.

CUCUMBER—HARRIS PERFECTION

Thirty feet of row. Plants one foot apart.

—	Date sown	Date planted	Ready for use	Number of cucumbers marketable	Weight marketable	Number of cucumbers unmarketable	Weight unmarketable	Total number of cucumbers	Total weight
					lb. oz.		lb. oz.		lb. oz.
With paper...	April 4	May 20	July 13	248	180 13	61	21 4	309	202 1
Without paper	" 4	" 20	" 24	65	35 ..	60	21 12	125	56 12

The paper shows an advantage of two and one-half times in total number of cucumbers and four to one in total weight.

MELONS—HEART OF GOLD

Row 30 feet long. Plants one foot apart.

—	Date sown	Date planted	Ready for use	Number of fruit market-able	Weight market-able	Number of un-market-able	Weight un-market-able	Total number of fruit	Total weight
					lb.		lb.		lb.
With paper...	April 4	May 20	Sept. 6	70	74	16	7	86	81
Without paper	April 4	May 20	Sept. 6	Nil	Nil	15	5	15	5

With the paper the total number of fruits was 86 weighing 81 pounds. Without the paper the number was 15, weighing 5 pounds, in fact a total failure.

BEANS—ROUND POD KIDNEY WAX

Fifteen feet of drill thinned to 4 inches apart, harvested when ready for table as a green vegetable.

—	Date sown	Date germ.	Height of plants when ready for use	Date ready use	Weight first 3 pickings	Total weight	Number of market-able pods	Number of un-market-able pods	Total number of pods
			in.		lb. oz.	lb. oz.			
With paper...	April 27	May 15	18	July 10	1 14	15 1	772	314	1,086
Without paper	April 27	May 15	15	July 8	2 12	10 12	683	321	1,004

The advantage, though in favour of the paper, is not outstanding in the case of beans, while the total weight of the first three pickings of pods is distinctly higher where paper was *not* used. Hence paper did not induce earliness in the crop.

BEANS—ROUND POD KIDNEY WAX

Again the paper did not demonstrate its worth. Only 57 per cent of the beans grew owing to the excessive moisture in drill. Observation confirmed our former opinion that in early season or on wet ground in any season, the paper, by conserving moisture over the field brings about an excessively wet condition at the drill, much wetter than would be obtained if the soil moisture were allowed to evaporate over the whole field as it does under normal conditions.

BEANS—STRINGLESS GREEN POD

Rows 30 feet, thinned to 4 inches in row. Fifteen feet harvested when pods were ready, and fifteen feet left to ripen.

——	Date sown	Date germ.	Height when ready use	Date ready use	Weight first three pickings	Total weight	Number market-able pods	Number unmar-ketable pods	Total number of pods
			in.		lb. oz.	lb. oz.			
			Fifteen feet harvested as green beans						
With paper...	April 27	May 14	23	July 9	2 12	14 12	1,520	381	1,901
Without paper	" 27	" 14	" 18	" 6	3 2	7 9	502	174	679
			Fifteen feet harvested as dry beans, threshed September 3						
With paper...	.....	.....	23	.....	.....	4 3	.....	.....	.....
Without paper	.....	.....	18	.....	.....	2 15	.....	.....	.....

This variety of beans, Stringless Green Pod, evidently is better able to resist unfavourable soil conditions, for the germination with this variety was very good, hence influence of paper marked. Three and two to one in favour of paper.

BEET—DETROIT DARK RED

Thirty feet of drill, plants two inches apart, fifteen feet harvested when fit for table, fifteen feet left until end of season.

—	Date sown	Date germ.	Date when ready	Number of roots market-able	Weight market-able	Number of roots unmar-ketable	Weight unmarket-able	Total number of roots	Total weight
					lb. oz.		lb. oz.		lb. oz.
Fifteen feet harvested when ready									
With paper...	April 25	May 7	June 29	78	34 9	.....	.....	78	34 9
Without paper	" 25	" 7	July 6	68	27 13	16	2 ..	84	29 13
Fifteen feet harvested Oct. 31									
With paper...	April 25	May 7	June 2	60	29 ..	10	18 ..	70	47 ..
Without paper	" 25	" 7	.....	72	38 ..	4	5 ..	76	43 ..

It will be noticed that in the case of beets the differences are not significant.

CARROTS

Carrots were thinned to 2 inches apart in rows thirty feet long. Fifteen feet were harvested when ready and fifteen feet left until end of season.

—	Date sown	Date germ.	Date when ready	Number of roots market-able	Weight market-able	Number of roots unmarket-able	Weight unmarket-able	Total number of roots	Total weight
					lb. oz.		lb. oz.		lb. oz.
Fifteen feet harvested when ready									
With paper...	April 25	May 5	July 10	110	27 3	10	12 ..	120	27 15
Without paper	" 25	" 5	" 20	87	18 ..	35	2 4	121	20 4
Fifteen feet harvested Oct. 31									
With paper...	April 25	May 5	.....	129	53 ..	.....	.....	129	53 ..
Without paper	" 25	" 5	.....	134	44 ..	.....	.....	134	44 ..

TOMATO—BONNY BEST

Ten plants were used in this test, spaced thirty-six inches apart.

—	Date sown	Date planted	Date first ripe fruit	Weight first two weeks	Total weight market-able	Weight unmarket-able	Weight black spot	Total green fruit	Total weight
				lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.	lb. oz.
With paper...	April 4	May 28	Aug. 7	9 1	44 12	38 6	15 4	45 ..	143 4
Without paper	" 4	" 28	" 16	7 ..	43 5	23 10	4 10	36 ..	107 9

The yield of tomatoes though greater where paper was used was not outstandingly so, in fact not so great as in other cases coming under the observation of the writer.

PEPPER—HARRIS EARLY

Nineteen plants spaced nineteen inches apart.

—	Date sown	Date planted	Date when ready	Number of fruit	Weight ripe fruit	Number green	Weight green	Total number	Total weight
					lb. oz.		lb. oz.		lb. oz.
With paper...	April 4	May 29	Aug. 28	94	9 2	75	3 12	169	12 14
Without paper	" 4	" 29	Sept. 3	72	6 8	18	.. 12	90	7 4

The paper almost doubled the yield in number and weight.

EGG PLANT—NEW YORK PURPLE

Fifteen plants spaced 2 feet apart were used here.

—	Date sown	Date planted	First fruit ripe	Number fruit	Weight market-able	Number unmarket-able	Weight unmarket-able	Total number fruit	Total weight
					lb. oz.		lb. oz.		lb. oz.
With paper...	April 4	May 20	Sept. 24	30	26 4	10	2 ..	40	28 4
Without paper	" 4	" 20	Oct. 22	7	7 9	5	.. 14	12	8

Paper here shows an advantage in total yield and weight of about $3\frac{1}{2}$ to 1.

SPINACH—KING OF DENMARK

—	Date sown	Date germ.	Length and breadth of leaf 4 weeks	Date of first picking	Last picking	Weight	Total weight
						lb. oz.	lb. oz.
With paper	April 25	May 5	7 x $4\frac{1}{2}$	June 12	July 10	13 4	13 4
Without paper	" 25	" 5	$3\frac{1}{2}$ x 2	" 29	July 10	2 14	2 14

It will be noted that the crop of spinach was increased about six times by the use of paper.

POTATO—IRISH COBBLER

Thirty sets planted twelve inches apart were used in this project.

—	Date planted	Per cent germ.	Date full bloom	Date harvest	Per cent disease	Weight market-able	Weight unmar-ketable	Total weight
		%			%	lb. oz.	lb. oz.	lb. oz.
Fifteen sets dug when ready								
With paper	April 22	83	June 18	Aug. 2	26	10 ..	4 8	14 8
Without paper	April 22	82	June 20	Aug. 2	25	8 8	3 8	12 ..
Fifteen sets dug Aug. 16 when tops were dry								
With paper	April 22	83	June 18	Aug. 16	26	12 ..	4 8	16 8
Without paper	April 22	82	June 20	Aug. 16	25	10 ..	4 ..	14 ..

POTATO—UP-TO-DATE

—	Date planted	Per cent germ.	Date full bloom	Date harvest	Per cent disease	Weight marketable	Weight unmarketable	Total weight
		%			%	lb. oz.	lb. oz.	lb. oz.
Fifteen sets dug September 3								
With paper	May 16	98	July 4	Sept. 3	5	18 ..	4 ..	22 ..
Without paper	May 16	96	July 6	Sept. 3	5	16 ..	4 ..	20 ..
Fifteen sets dug October 29								
With paper	May 16	98	July 4	Oct. 29	5	19 ..	5 ..	24 ..
Without paper	May 16	96	July 6	Oct. 29	5	16 ..	3 8	19 8

Owing to the fact that better seed could not be obtained, considerable disease developed in the plantation. Hence yields are low in all cases. The advantage is with the paper but the differences are slight.

CAULIFLOWER—SNOWBALL

Twenty plants were set in this instance, eighteen inches apart.

—	Date sown	Date planted	Date 6 inches in diameter	Per cent maggot	Number of marketable heads	Number of unmarketable heads	Total number of heads	Total weight
				%				lb.
With paper	Mar. 28	May 6	July 8	25	12	3	15	17
Without paper	Mar. 28	May 6	July 13	5	10	7	17	15

The bad showing of the paper in this instance is due to the fact that in case of the plot without paper, the ordinary treatment for maggot, viz., corrosive sublimate was used, resulting in only five per cent maggot, but in the papered plot twenty-five per cent of the plants were attacked. It would appear that the paper cannot be regarded as of value in the control of root maggot.

CABBAGE—GOLDEN ACRE

Twenty cabbage plants were set eighteen inches apart.

—	Date sown	Date planted	Heads 6 inches and hard to tough	Per cent maggot	Number of marketable heads	Number of unmarketable heads	Total number of heads	Total weight
				%				lb oz.
With paper	Mar. 28	May 6	July 25	$7\frac{1}{2}$	12	5	17	68 ..
Without paper	Mar. 28	May 6	Aug. 6	$2\frac{1}{2}$	12	7	19	67 ..

No doubt the cabbage maggot again was a factor in decreasing the yield from the papered plots for $7\frac{1}{2}$ per cent of the plants were attacked and only $2\frac{1}{2}$ per cent where paper was not used.

CELERY—GOLDEN PLUME

Thirty plants, six inches apart.

—		Date sown	Date planted	Height 4 weeks after planting	Date of digging	Height at digging	Condition of crispness	Weight of 12 heads
				in.		in.		lb. oz.
With paper.....	.....	Mar. 28	June 8	16	Nov. 8	24	Good.....	22 ..
Without paper.....	.....	Mar. 28	June 8	14	Nov. 8	19	Good.....	12 ..

The yield November 8 was almost doubled by the use of paper, based on 12 heads. The plants were not all dug at the time since they had not completed their growth for the season. The weights, though low, are relatively correct now, and probably so at any time.

CORN—GOLDEN BANTAM

Thirty plants thinned to eight inches apart.

—	Date sown	Height and date of tasseling	Date of silking	Date ready for use	Number of marketable cobs	Number of unmarketable cobs	Total number of cobs	Total weight
								lb. oz.
With paper.....	April 27	4 feet, 6 inches July 15	July 22	Aug. 14	58	5	63	22 9
Without paper.....	April 27	3 feet, 6 inches July 29	July 29	Aug. 25	30	7	37	11 7

LETTUCE—ICEBERG

Thirty plants thinned to eight inches apart.

—	Date sown	Date of first head	Date of first 6 heads	Weight of 6 heads	Number of marketable heads	Number of unmarketable heads	Total number of heads	Total weight
				lb. oz.				lb. oz.
With paper.....	April 27	July 17	July 22	7 8	38	6	44	42 ..
Without paper.....	April 27	July 22	July 22	6 8	34	10	44	38 ..

On another field owned and operated by the writer three acres were given to vegetables and strawberries with and without paper. One acre in garden peas confirmed our former opinion that paper did not increase the earliness of the crop or increase the yield to any extent, though the vines were much longer. The acre given to strawberries planted in early spring of 1929 has been a great surprise to everyone. Although the field has not been subjected to the yield test the plants are exceptional in every way and have been from the start fully twice as large as those plants beside, of the same variety and set at the same time. The third acre given to vegetables confirms our findings as reported, always showing increase in favour of the paper, especially in such crops as squash, cucumbers, melons, etc.

That paper will increase the yield of most crops has been definitely settled to the satisfaction of the writer, but *can the gardener afford to use paper* is a question of an entirely different nature. The thirty-foot row was hoed where paper was not used, seven times. The total time given to it was 35 minutes, costing about 20 cents. The extra time taken to place the paper and the extra trouble in setting the plants is almost exactly equal to the time given to the cultivation, so thus far we have broken even. There remains the cost of the paper to be set against the increased yield. Standard type paper 36 inches wide costs at retail $1.85 per roll, that is paper for 30 feet of row costs about 41 cents. Increase in weight of onions of 11 pounds at 3 cents per pound, viz., 33 cents, does not show a profit. Increase in number of marketable cucumbers from 65 to 248, a difference of 183 at 2 cents is a matter of $3.66. Here the paper paid. Figure it out for yourself. You will find it pays in many cases and not in others depending upon your location, the kind and value of the crop.

Certain recommendations are in order after four years work.

1. Perforations do not add to the value of the paper. In some measures we hinder the work which we hope to accomplish when holes are punched through the paper at regular intervals. Weeds usually find these holes, and are removed with much difficulty.

2. Special papers should be made to suit special crops, and the plants set through it when possible. Perforations should be made to suit the crop and no other. This would insure straight lines, correct spacing and ease in setting the plants through it.

3. Covering the edge of the paper with soil, preventing the wind from getting under, is the simplest way of holding the paper down. Wire staples may be used to advantage in special cases.

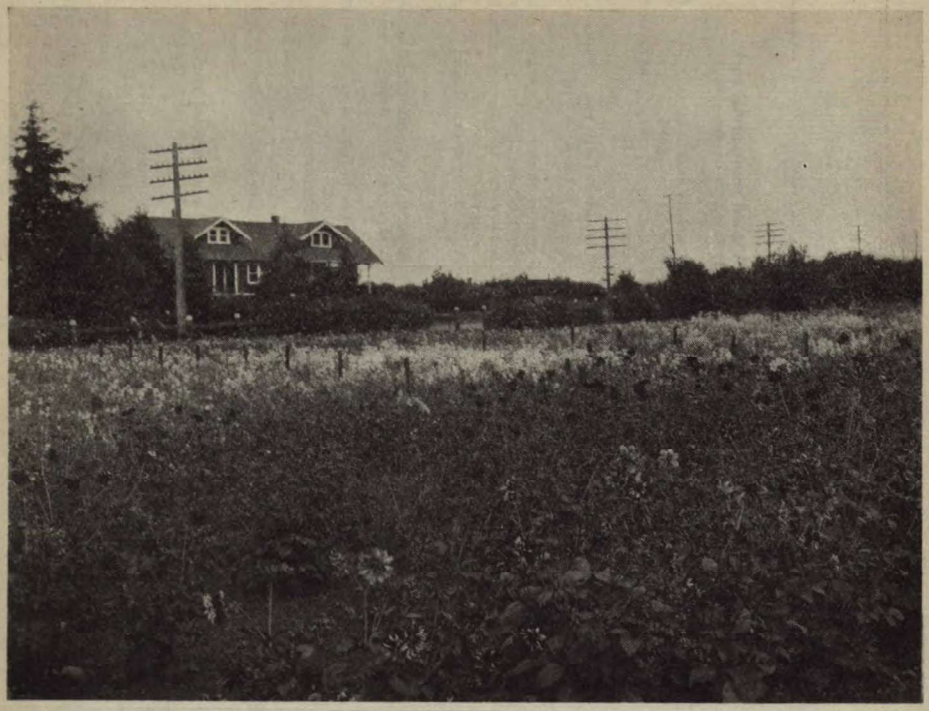
SEED GROWING

Though seed growing is not new at the Experimental Station, it was not until 1928 that a systematic attempt was made to grow "Elite" stock seed under the regulations governing the Canadian Seed Growers' Association. All provincial institutions, as well as the Experimental Farms have been carrying on with their own select list of vegetables grown for the production of stock seed. The list assigned to us was as follows:—

Beans—Kentucky Wonder Long Pod
Cauliflower—Early Dwarf Erfurt
Lettuce—Hanson
Onion—White Portugal
Peas—Advancer
Spinach—New Zealand.

The seed was obtained from many seed houses, and the plots of each variety grown were of considerable size. The plants were studied from the standpoint of size, quality, production, etc., and the selection made of one plant in each instance. The plant selected was, of course, the best one found, at least from our standpoint. The seed has been sown for the past two years, except in the case of cauliflower. Seed sufficient to sow a considerable acreage is now available.

In addition to the growing of Elite stock seed, sweet peas, dahlias, penstemon, antirrhinum, phacelia, poppies, didiscus, etc., were sown in commercial quantities for one of the seedsmen. Though this seed was grown from the com-



Seed growing on the Sidney Station.

mercial viewpoint much valuable information was secured in regard to yield, cost of production, etc., etc. The questions of disease and insect pests are problems to be met in the production of flower seeds as well as in the other fields of agriculture.

GREENHOUSE

The greenhouse has continued to be of the greatest use in supplementing the work in vegetable gardening, in the landscape and in floriculture. Apart from experimental work much has been completed which could not have been attempted without such aid. Various lines of work begun in the greenhouse, have been continued in the field. Some of these have been reported on; others are not complete. Reports on these projects are reserved for the present. One house has been in tomatoes, each year since the beginning of the work, followed in the autumn by a crop of chrysanthemums. For the tomato report see the annual report for this station, 1928. During 1929 a crop of cucumbers was grown during the time given to the tomatoes in other years, followed by chrysanthemums as before.

Many chrysanthemums obtained from many sources, chiefly from the Ottawa Horticultural Division have been grown for several years. A report of them, under conditions such as obtain at Saanichton is here given. Beside the 43 varieties grown in 8-inch pots, 25 varieties or so were grown outside during the summer and lifted at the end of September. These are also reported on.

Name	Section	Bush or single stem	Season	Single or double	Diameter bloom	Colour	Form	Value	Remarks
					in.				
Glorious	Commercial	Bush	Medium	Double	5	Pale pink	Reflexed	Good	A good commercial sort
Hon. J. R. Mann	Exhibition	Single stem	"	"	6	Crimson	"	Very good	A fine exhibition sort
H. B. West	"	"	"	"	8	Yellow	Loose Japanese form	"	A lovely bloom
J. H. Grisdale	Single	Bush	"	Single	3	Light crimson		Fair	A good pot plant
King of the Plumes	Feathery	"	Late	Double	4	Orange yellow		Very good	A distinct variety, good colour
Lord Hopetown	Exhibition	Single stem	Medium	"	6	Crimson gold	Reflexed	"	
Madame Lunt	Single	Bush	"	Single	3	White anemone disk	"	"	A good variety rich colour.
Marigold	Exhibition	Single stem	"	Double	8	Rich yellow	Incurved	"	A fine exhibition variety good colour
Major Bonaffon	Commercial	Bush	"	"	5	Yellow	"	Good	Good commercial variety
Mrs. D. L. Warner	Exhibition	Single stem	"	"	8	Rich yellow	Reflexed	Very good	First class exhibition variety
Mrs. W. C. Emmette	"	"	"	"	8	Creamy white	Incurved	"	A lovely bloom of dainty colour
Mrs. Wm. Duckham	Commercial	Bush	Late	"	5	Rose pink	Reflexed	Good	A good commercial sort
Mrs. Swinburne	"	"	"	"	5	Creamy white yellow toward centre	Incurved	"	A good late commercial sort
Miss Gladys Wooderson	Exhibition	Single stem	Medium	"	6	Amaranth	Reflexed	Very good	A striking exhibition variety
Miss M. Rogers	"	"	"	"	6	Amaranth golden reverse	"	"	Good commercial or exhibition variety
Miss Marion Hankey	Commercial	Bush	Late	"	5	Pink	"	Good	Fine commercial sort
Naomah	Exhibition	Single stem	Medium	"	7	Pure white	Incurved	Very good	One of the best either for commercial or exhibition
Odessa	"	"	"	"	8	Bright yellow	"	"	Very fine and reliable
Pomona	Anemone	Bush	"	"	3	White with pale yellow centre	True anemone	Good	Good commercial variety
Peace	Commercial	"	"	"	4	Pale yellow	Reflexed	"	Good commercial variety
Portia	Single	"	"	Single	4½	Crimson gold reverse	Cactus form	"	Beautiful decorative sort
Pacific Supreme	Commercial	"	"	Double	4	Pale rose pink	Reflexed	"	Good commercial variety
Smith Enchantress	"	"	Early	"	4	Pink	"	"	A fine early pink for commercial work
Anna H. Condiet	Single	"	Medium	Single	3	Bronze	"	Fair	Colour too pale to be of value
Aduana	Commercial	"	"	Double	5	Bright pink	"	Good	Good variety for pot work
A. S. Watt	Exhibition	Single stem	Late	"	6	White	Incurved	"	Fine exhibition variety
Anne Nicholls	Commercial	Bush	Medium	"	4	Pink	Reflexed	"	Good commercial sort

Berta	"	Single stem	"	"	6	Crimson gold reverse	"	"	Very showy variety
Chrysolora	"	Bush	"	"	4	Canary yellow	"	Very good	A valuable commercial variety, good colour
Dr. Marcus A. Curry	Single	"	"	Single	3½	Amaranth		Good	Fine decorative variety
Dr. Enguehard	Commercial	"	"	Double	5	Bright pink	"	"	Good commercial variety
Earl Kitchener	Exhibition	Single stem	"	"	8	Amaranth silver reverse	"	Very good	Striking large flowered variety
Flamingo	Commercial	Bush	"	"	6	Rich crimson	"	"	Good commercial variety
Grace Coolidge	Exhibition	Single stem	"	"	7	Flesh pink	Incurved	"	A very good bloom
Grafvon Oriole	Anemone	Bush	"	Single	6	Amaranth yellow centre		Good	Good decorative variety
Sun Gold	Commercial	"	"	Double	4	Bright yellow	"	"	Excellent commercial variety
Stephen Brown	"	"	"	"	4	Bronze gold reversed	Reflexed	"	Fine commercial sort
The Garden Club of America	Exhibition	Single stem	"	"	9	Bronze	"	Very good	A bloom of great substance
Thanksgiving Queen	Commercial	Bush	Late	"	5	Creamy white	Incurved	Good	Good late commercial variety
White Turner	Exhibition	Single stem	Medium	"	8	Pure white	"	Very good	First class exhibition bloom
White Chieftain	Commercial	Bush	"	"	4	White	"	Good	One of the best commercial varieties
Wells Late Pink	"	"	"	"	5	Soft pink	Loose form	"	Beautiful commercial variety
Yellow Turner	Exhibition	Single stem	"	"	8	Very pale yellow	Incurved	Very good	First class exhibition variety

Chrysanthemum display in the greenhouse.

HARDY MUMS

Single:—
- Sylvia Slade—Crimson
- Pink Pagoam—Pink
- Godfrey's Bronze—Bronze
- Uncle Sam—Pink
- Lady Astor M.P.—Crimson
- Mildred Presby—Pink
- Winnifred Perry—Bronze
- Fantasia—White

Pompom:—
- Uvalda—Pale pink
- Nellie Blake—Bronze
- Acto—Pink
- Wellington Mack—Yellow
- Rose Royal—Pale pink
- November Pearl—Pale pink
- Pink Doty—Pale pink
- Bellingham—Pale pink

Button:—
- Meteor—Yellow
- Crista—Yellow
- Dorothy Gish—White

Anemone:—
- Queen Margaret—Pale pink
- Primrose—Yellow
- Puritan—White
- Titian Beauty—Crimson
- Golden State—Yellow
- Triumph—Yellow

CUCUMBERS

As intimated cucumbers replaced the tomatoes in No. 1 house. The crop was good and the quality most excellent. Part of the plants were set on the ground level and part on a bench. Eighty plants on the ground in three rows produced 2,120 cucumbers at average price of 11½ cents each, making a total of $243.80. The yield of the outside row was lessened for want of head room. The thirty plants on bench, single row, produced 750 cucumbers valued at $86.25. The return from the house will be noted viz: $330.05. The bench contained 180 square feet, and the ground 975 square feet. The return per square foot was not equal to that from tomatoes, the standard greenhouse crop of Vancouver Island. The cucumbers were planted February 13 and pulled July 2. Tomatoes, the previous year, were planted February 20 and plants pulled August 4, hence they occupied the bench for a slightly longer time than the cucumbers, but only for a few weeks.

DEHYDRATION

The dehydration plant, of the air blast cabinet type, was installed in the spring. The fruit is dried by means of steam heated air driven by fans through the trays of fruit. The cabinet holds 20 trays capable of carrying about half a ton of prunes, or a quarter of a ton of Logan or blackberries. Tests were carried out with Loganberries, blackberries and prunes.

Two tons of Logans were put through with fair results. Where the berries were firm, yet ripe when picked, the resulting product was of good colour and size. On the other hand where the berries were full ripe to soft the result was a poor grade of dried fruit, being "slabbed" and broken down and of poor colour. No preliminary treatment, other than sorting was necessary for berries. They were started in the dehydrator at a temperature of about 175 to 180 degrees F. and finished at about 140 to 150 degrees F. These temperatures would dry the fruit in from 11 to 13 hours. Half a ton of blackberries was dried with success, the product being of excellent quality and flavour. The ratio of fresh berries to the dry product averaged 5.5 to 1.

The following varieties of prunes were tested out as to their suitability for drying. Buhlerthal, Eberswier, Sugar Prune, Tennant, Letricourt and Italian, but the last named proved to be the only variety satisfactory from all standpoints, the others being mostly too small and of a poor flavour.

It was found that prunes had to be ready to fall to the ground before picking, to be in prime condition for drying in order to obtain their full flavour and quality. Before being put in the dehydrator prunes are dipped in a hot solution of lye, 1 pound to 20 gallons of water, for 15 to 30 seconds, long enough to slightly check or crack the skin in order to hasten evaporation, and then rinsed in clear water. One-half ton of prunes were dehydrated. They were started at a temperature of 115 to 125 degrees F. and finished at 160 to 175 degees F. About 30 hours were required to dehydrate this fruit. The drying ratio for prunes averaged 3.5 pounds of fresh fruit to 1 pound of dried.

The dried fruit is stored in bins for some weeks where it undergoes "sweating" and the excess moisture from under-dried fruits is taken up by the drier fruit, so equalizing the product as regards moisture content. Berries are then ready for grading and packing.

Before packing prunes they are usually processed, which consists of immersing them for 2 minutes in water brought to the boiling point. This processing sterilizes the fruit, softens it, and gives it a glossy appearance. The fruit is then packed directly from the processor, while still hot, into paper lined boxes, and pressed down flush with the top of the boxes by means of a press.

THE ARBORETUM

Fifteen years have now been given to the testing of trees and shrubs at the Vancouver Island Station. The area given over to this work comprises some ten acres in the arboretum proper, besides extensive plantings throughout the station grounds and park area. Plantings were first made in the spring of 1914 and were of a very complete and comprehensive nature, material being secured from Oriental, American and European nurserymen, with the result that there is at this station one of the most extensive collections to be found in Western Canada. Many native species have been added from time to time. Of the large numbers of species and varieties tried by far the greater numbers have proved hardy; some while no doubt hardy, failed to withstand the shock of transplanting owing to an intensely dry summer season; others have been unable to adapt themselves to soil and climatic conditions.

Owing to lack of space an attempt is being made in the present report to deal with the conifers, junipers and yews only, giving something on description and on behaviour here. The size of tree is from measurements taken at the close of the 1929 season.

CONIFERÆ

Abies Fir

The name spruce is often erroneously applied to many of these trees. They are tall pyramidal trees of temperate and cold climates, and may be planted for ornament, for shelter or for timber. In cultivation firs are most beautiful while young, usually losing their lower branches and becoming thin and unsightly as they grow older. Many of the species have little ornamental value for more than fifty years. The firs prefer moist, well-drained soil conditions. All the species produce soft perishable wood sometimes manufactured into lumber, and balsamic exudations contained in the prominent resin vesicles in the bark characteristic of the genus. The species of fir are less valuable than those of the spruces and are not planted in Canada or the United States except for ornamentation.

Abies Apyollinis, Link.—A native of Southern Europe. Planted in 1915, has proved hardy and attained a height of 7 feet. Growth has been slow.

Abies balsamea, Mill. Balsam Fir.—This tree is a native of Canada. Its branches are very short and turned up at the ends, its beauty is short-lived. Canadian balsam, or balsam of fir, is obtained from its bark. Planted in 1919 it is now 11 feet in height and in good condition.

Abies carborensis, Algerian Fir.—Planted in the spring of 1919, but did not survive the intensely dry summer season of that year.

Abies brachyphylla, Maxim.—Tree 80 to 100 feet. Obtained from Yokahama Nurseries planted in 1915 and died the following year though it is reported to be hardy here.

Abies cephalonica, Loud. Cephalonica Fir.—Obtained from Barbier, France, in 1915, this tree has proved quite hardy here though growth has been very slow. The specimen is now only 6 inches in height. It can hardly be recommended for planting.

Abies concolor, Lindl. White Fir.—Obtained from the Central Experimental Farm, Ottawa, in 1915 this fir has proven worthy of planting as an ornamental. It is hardy, grows rapidly and is native of the lower Pacific Coast regions. Has attained a height here of 15 feet.

Abies firma, Sieb.—Obtained from the Yohahama Nurseries in 1917, but did not become firmly established, dying in 1920.

Abies grandis, Lindl., Grand Fir.—A native of this region of the Pacific coast as far south as Northern California. In its native state it attains a height of from 200 to 300 feet. A rapid grower, it soon loses its beauty and because of this has but little value for ornamental plantings.

Abies nobilis glauca, Lindl. Red Fir.—Not as large a tree as grandis but used to some extent for ornamentation. Obtained in 1916 this tree has attained the height of 9 feet. This fir is absolutely hardy and native of the mountain slopes of Oregon and Washington.

Abies nordmanniana, Spach. Nordmannis, Silver Fir.—A very desirable fir for planting, grows rapidly and has done well. Planted in 1915 this tree is now 20 feet high.

Abies pectinata, D.C. Silver Fir.—Native of Southern Europe, is valuable for its wood and yield of turpentine. Obtained from Barbier, France, in 1921 the tree is in good condition and has attained a height of 4 feet 6 inches. Leaves are flat, dark green and lustrous above and silvery white below.

Abies pinsapo, Boiss. Spanish Fir.—As indicated by the name this tree is a native of Spain and in America is not usually hardy north of the middle states.

Abies veitchi, Lindl.—Planted in 1917 this fir seemed to become established for a time but died in 1920. It is, however, one of the most beautiful of fir trees when young and should prove hardy here.

Araucaria

Araucaria imbricata, Pav. Monkey Puzzle.—This species is grown in the open in England and is hardy on the Pacific Coast doing exceedingly well on Vancouver Island. It should be planted in a sheltered place where it will be protected from strong winds as its branches are heavy and rather brittle. Its symmetry is soon marred if planted in an exposed position. It is recommended for planting, though objected to by many people.

Cedrus, Cedar

These trees are grown because of their evergreen foliage and striking habit. They are large ornamental conifers with wide-spreading branches, quite distinct from most others. The cedars are usually considered tender, though the Atlantica is hardier than either the Libani or Deodara, being grown as far north as the great lake district. All three specimens are hardy on Vancouver Island.

Cedars must be planted in a well drained location as they cannot stand stagnant moisture. Plants of this genus are the true cedars, though trees of other genera are often called cedars. The very durable and fragrant wood of all cedars is highly valued.

Cedrus atlantica, Manette. Mt. Atlas Cedar.—This is a large pyramidal tree with upright leading shoots. Planted in 1916 this tree is in good condition and is 23 feet in height. A splendid tree for planting. The variety *glauca* is a very desirable and vigorous form with foliage of a silvery hue and very glaucous.

Cedrus deodara, Loud. Indian Cedar.—Native of northern India. A tall tree of pyramidal habit. Planted in 1917 it has attained a height of 24 feet. It is quite hardy at this station.

Cedrus libani, Loud.— A large tree with wide spreading horizontal branches. Planted in 1915, a height of 12 feet has been reached. This species seems to be perfectly hardy here. Aside from its beauty the famous cedar of Lebanon is of peculiar interest for its historic and religious associations.

Cephalotaxus

These are ornamental evergreen shrubs, in appearance very much like a yew, but of more graceful habit. These shrubs are hardy here but should be planted in sheltered locations in a somewhat moist but well drained sandy loam, a partly shaded position preferred.

Cephalotaxus drupacea, Sieb. and Zuce.—Planted in 1915 this shrub has attained a height of 5 feet 3 inches while authorities state that 12 feet is the maximum growth.

Cephalotaxus fortunei, Hook.—This is a very excellent shrub for planting and the most graceful of the species. Leaves are tapering, dark green and shining above. In northern China and Japan it attains a height of 50 feet.

Cephalotaxus pedunculata, Mast.—Not as an attractive a form as Fortunei but has made satisfactory growth since planting in 1913. The specimen is now about 6 feet in height.

Cunninghamia

Cunninghamia sinensis.—Named after J. Cunningham who discovered this conifer growing in China. These are evergreen trees grown for their handsome foliage. They prefer partial shade and a light loamy soil. They can hardly be recommended for planting.

Cupressus, Cypress

These are trees cultivated for their graceful habit and for their high ornamental value. Their foliage is evergreen and aromatic. The cypress seem not to be very particular in regard to soil and situation but prefer a deep sandy loam. Most of the varieties tried at this station have proved hardy and made satisfactory growth.

Cupressus benthami, Knightiana, Mast.—Planted in 1919. Height 10 feet. Condition good. Attains a height of 70 feet with horizontal branches forming a pyramidal head.

Cupressus macrocarpa, Hartw. Monterey Cypress.—Planted in 1917 and made good growth until 1925 when it died. This cypress, native of California attains a height of about 60 feet with horizontal branches forming a broad spreading head.

Cupressus lawsoniana, Alumii, Beissn.—One of Lawson's cypress of columnar habit with foliage very glaucous with a bluish metallic hue. Planted in 1916 this specimen has attained a height of 18 feet and is highly recommended.

Cupressus lawsoniana Albo-Spica, Beissn.—A very excellent variety of this cypress, with tips of branchlets creamy white, of slender habit, hardy and has grown to height of 18 feet since 1916.

Cupresses lawsoniana argentea.—Distinguished because of its almost silvery foliage, also glaucous and of slender habit. Planted in 1917. Height 20 feet. Condition excellent.

Cupresses lawsoniana gracilis, Beissn.—Another elegant form, light green in colour with graceful pendulous branches. Planted in 1916. Hardy. Height 10 feet.

Cupressus lawsoniana filiformis, Beissn.—Of globular habit with branches long and pendulous, very low in form. Planted in 1916. Height 3 feet.

Cupressus lawsoniana lutea, Beissn Golden Cypress.—This is one of the best of the golden cypress, very graceful in habit. Whether hardy or not it is difficult to say as the specimen in the station arboretum planted in 1916, while doing well for a time, died in 1923.

Cupressus lawsoniana lycopodioides, Carr.—Planted in 1916. Died in 1925. A very low form of somewhat irregular habit. Not recommended.

Cupressus lawsoniana mimina glauca.—Obtained in 1915 from Barbier, France. A very low form, hardy, in good condition. Not recommended.

Cupressus lawsoniana monumentalis.—Another rather low form from Barbier, France. Planted in 1916. Condition good. Not as desirable a variety as many other Cypress.

Cupressus lawsoniana rosenthali.—Planted in 1916. Received from Barbier, France. Died 1919.

Cupressus lawsoniana schongariensis.—Planted in 1917. Received from Barbier, France. Died 1925.

Cupressus lawsoniana Silver Queen.—Another low growing form. Planted 1921. Hardy. Height 4 feet. Not recommended.

Cupressus lawsoniana stricta corulea.—Planted in 1916. Received from Barbier, France. Died 1925.

Cupressus lawsoniana stricta viridis, Carr.—Received in 1915 from Barbier, France. Died 1925.

Cupressus lawsoniana wisseli.—Received from Barbier in 1917 and never became established, possibly its location in the arboretum was too wet.

Cupressus pisifera plumosa, Beissn. SAWARE CYPRESS.—Specimen planted in 1919, but while of a hardy species, did not withstand the drought of the first season.

Cryptomeria

These are ornamental evergreen trees cultivated for their handsome habit and foliage. They are pyramidal in form with straight slender trunks covered with reddish brown bark. Brought to this station from a Japanese nursery, a number of varieties have proved to be quite hardy. They thrive best in rich, loamy and moist soil and in rather a sheltered position.

Cryptomeria japonica, Don. JAPANESE CEDAR.—Tree with fern-like upward spreading branches. A large tree, planted in 1916, the tree has now a height of 16 feet. Highly recommended for planting.

Cryptomeria japonica elegans, Beissn.—Botanically a variety of japonica but so very distinct that the relationship is difficult to recognize. Foliage very fine and feathery but also very compact. A rich green in summer, changing to purplish bronze in winter. Much lower and denser than japonica. Planted in 1916. Height 6 feet.

Other varieties received from the Yokahama Nurseries:—

Cryptomeria Kussari, sugi.
Cryptomeria sekki, sugi.
Cryptomeria yenko, sugi.
Cryptomeria yoshino, sugi.

Juniperus, JUNIPER

The junipers are mainly small trees of rather slow growth. They have two kinds of foliage; one is needlelike, prickly and in whorls of three, the other is scalelike, overlapping and arranged in four rows like those of Cupressus which they often closely resemble. Most species show both kinds of foliage on the same tree. Juniperus has whitish lines or marks on the upper surface of the leaves. Similar forms of Cupressus and allied genera have the whitish marks beneath.

The Junipers thrive best in sandy, loamy soil but do well on almost any kind of soil. They prefer sunny, open situations, and are well adapted for hedges and for planting as shelter or windbreaks. Also adapted for seaside planting.

Juniperus bermudiana, Luin.—Planted in 1919 but failed to thrive, dying in 1923. Sub-tropical variety.

Juniperus rigida, Sieb.—A graceful hardy low tree from Japan with slender branches. Planted in 1917, height 14 feet. Condition good.

Juniperus scopulorum, Sarg.—A native of British Columbia though the specimen in the arboretum has not been found hardy. Planted in 1917 and died in 1923.

Larix LARCH, TAMARACK

The larches are handsome trees of regular pyramidal habit. They are deciduous conifers and are particularly beautiful in the spring with their light green foliage, studded with usually bright purple pistillate flowers. They are very hardy. Two varieties have been grown since 1916 and have done well.

Larix dahurica, Turez. SIBERIAN LARCH.—This variety has made rapid growth, being now 21 feet.

Larix leptolepis, Murr. JAPANESE LARCH.—A splendid lawn tree of pyramidal habit. Height 11 feet. Planted in 1916.

Picea, SPRUCE

The spruces are usually tall trees though sometimes dwarfed in horticultural varieties. Their regular pyramidal habit makes them valuable trees for ornamental park planting, for lawns and windbreaks. They will grow in almost any type of soil but do best in moist sandy loam. Slopes of northern aspect are well suited for spruces and they thrive better in shady positions than do most other conifers.

Picea excelsa, Link. NORWAY SPRUCE.—This tree makes rapid growth and is extensively planted as an ornamental. One of the best for shelter and windbreaks.

Picea omorika, Bolle.—Planted in 1917. Died in 1923. A very handsome tree of slow growth.

Picea polita, Carr. TIGER-TAIL SPRUCE.—Planted in 1917. Died 1926. Very striking in appearance with rigid spring leaves.

Picea pungens, Engelm. COLORADO SPRUCE.—Planted in 1915, this tree has done well, is in good condition, 14 feet in height. A very handsome tree of symmetrical habit with light, almost silvery white foliage.

Picea pungens kosteriana glauca. KOSTERS BLUE SPRUCE.—Planted in 1915. Distinguished by its bluish foliage. Height 15 feet.

Picea sitchensis, Carr. SITKA SPRUCE.—Planted in 1916. Rapid grower and now 24 feet in height. Of high ornamental value. Native of B.C.

Pinus, PINE

The pines are among the important timber trees and many of them are valuable as ornamentals. They prefer light sandy soils. They are usually tall trees and in early life of regular pyramidal habit. Some seventeen varieties have been grown in the arboretum for fourteen years.

Pinus austriaca, Schneid. AUSTRIAN PINE.—Planted in 1919. Condition good. Height 15 feet. A tall tree, native of southeastern Europe.

Pinus ayacahuite, Ehreub. MEXICAN PINE. Planted in 1919. A very handsome tree from Mexico. Height 17 feet.

Pinus banksiana, Lamb. JACK PINE.—Planted 1920. Has very little ornamental value. Height 15 feet.

Pinus coulteri, Don. PITCH PINE.—Rapid growing, tree in good condition. Height 23 feet. Planted 1915.

Pinus contorta, Douglas. SCRUB PINE.—Planted in 1916. Height 18 feet. Condition good.

Pinus densiflora, Sieb. JAPANESE RED PINE.—Planted in 1915. Rather slow growing, hardy, height 6 feet.

Pinus jeffreyi, Balfour. JEFFREY PINE.—Planted in 1915. Tall trees of considerable ornamental value. Leaves 5 to 8 inches in length, hardy.

Pinus koraiensis, Sieb. KOREAN PINE.—A very handsome pine but slow growing. Height 9 feet. Planted 1915.

Pinus massoniana, Lamb. JAPANESE BLACK PINE.—Planted in 1915, height 17 feet; condition good, rarely cultivated.

Pinus monticola, Don. MOUNTAIN WHITE PINE.—Planted in 1917. Tall tree with slender spreading branches. Native of B.C.

Pinus montana mughus, Willk. SWISS MOUNTAIN PINE.—Scrubby, low growing. Very little value.

Pinus parryana, Engelm. NUT PINE.—Planted in 1915, height 9 feet. Condition of tree good. Hardy at this station.

Pinus radiata, Don. MONTEREY PINE.—A very handsome species with bright green foliage and of rapid growth. Planted 1915, height 30 feet. Valuable for seaside planting.

Pinus resinosa, Ait. RED OR NORWAY PINE.—Very tall tree of rapid growth, very hardy. Valuable for northern parks.

Pinus sylvestris, Linn. SCOTCH PINE.—Planted in 1919, height 13 feet. Condition good. Very little ornamental value.

Pinus sabiniana, Douglas. BULL PINE.—Distinguished by its long slender leaves which in some cases are 10 to 12 inches long. Distinct pine of loose habit. Planted in 1915, height 25 feet. Condition good.

Pinus torreyana, Carr. SOLEDAD PINE.—Height 16 feet, planted in 1915. Condition good. Not of high ornamental value.

Podocarpus

Podocarpus macrophylla, Don.—The podocarpuses are evergreen, tall trees with usually narrow dense foliage. They are rarely cultivated north of California. Sometimes grown as pot-plants in northern climates. The specimen plant introduced in the station arboretum in 1917 did not become well established and died in 1920.

Pseudotsuga

Psuedotsuga taxifolia, Brit. DOUGLAS FIR.—Commonly called Douglas Fir, is by far the best known tree of this species. A very valuable tree both from the standpoint of timber and as an ornamental. Native of B.C. and the Pacific slope as far south as Mexico. Should not be planted as a windbreak. As a specimen tree in lawns it grows very rapidly and is very desirable for this purpose.

Sequoia. REDWOOD

These are tall, massive, often gigantic forest trees grown as ornamental evergreens. Very rapid in growth.

Sequoia gigantea, D.C. CALIFORNIA BIG TREE.—Planted in 1915, height 24 feet, condition good. Suitable for large lawn and when given plenty of room it retains its branches from the ground up.

Sequoia sempervirens, Endl. CALIFORNIA REDWOOD.—Planted the same time as gigantea, it has made even greater growth. A very valuable ornamental tree.

Taxodium

Taxodium distichum, RICH. BALD CYPRESS.—A diciduous conifer of regular and symmetrical growth. Planted in 1915 it has attained a height of 11 feet here under much drier conditions than it enjoys in its native haunts, loving as it does swampy moist locations.

Taxus, YEW

These are ornamental woody plants grown for their dark green foliage and scarlet berry-like fruit. They are slow growing, desirable for park and lawn planting.

Taxus cuspidata, Sieb. JAPANESE YEW.—Planted in 1915, height attained 6 feet. Condition good, quite similar to the English Yew.

Taxus tardiva.—Another variety of Japanese Yew received from the Yokahama Nurseries in 1915. Height 5 feet 6 inches. Condition good.

Thuja, ARBOR-VITAE

Thuja gigantea, Nutt. GIANT ARBOR VITAE.—The most beautiful and rapid growing species of the thujas. They are grown for their handsome evergreen foliage and formal habit. Planted in 1916 the arboretum specimen has attained a height of 22 feet. Highly recommended for lawns and parks. They thrive best in somewhat moist loamy soil and are easily transplanted.

Torreya, NUTMEG

Torreya nucifera, Sieb. CALIFORNIA NUTMEG.—An evergreen tree somewhat yew-like and fairly hardy. Should be planted in a shaded and sheltered position. Planted in 1915, height now is 10 feet, condition good.

Tsuga, HEMLOCK

Tsuga canadensis, Carr. COMMON HEMLOCKS.—Valuable for its timber in Canada but a few varieties have been cultivated for their value as ornamentals. Unfortunately the specimen planted in the arboretum died through being in too wet a location.

CEREALS

The winter of 1928-1929 was much more severe than is usual on Vancouver Island. Temperatures dropped as low as 14° F., but the heavy blanket of snow, which covered the ground, saved the autumn sown crops from winter-killing. Seeding began about the end of September; and, owing to the open character of that season, was possible well into the middle of November. The precipitation for the year was very much below the average, but considerable rain during the growing season promoted a rapid growth. Yields were well up to the standard of previous years. The harvest of the autumn sown cereals started the first week in July, and that of the spring grains a month later. All crops were cut by the end of August.

WHEAT, FALL SOWN—TEST OF VARIETIES

Forty-four varieties and strains of winter wheat were under test at the Experimental Station, Sidney, in 1929. The results are given in the following table. Where available, the average yield for a number of years is also given. Results for any period less than five years should not be taken as conclusive.

WHEAT, FALL SOWN—RESULTS OF TEST OF VARIETIES

Variety	Date ripe	Length of straw	Strength of straw on scale of ten points	Weight per measured bushel	Yield per acre	Average yield for 4 years
		in.		lb.	bush.	bush.
Imperial Amber	July 21	52	9	62	55·5	46·2
Dawson's Golden Chaff	" 20	48	10	60	49·9	48·4
O.A.C. 104	" 20	51	10	60	49·2	39·7
Marshall Foch	Aug. 5	46	10	60	47·7	41·9
Golden Sun	July 31	50	10	58	46·3	40·8
Victor	Aug. 6	49½	10	59	44·1	39·9
V.I.S. No. 131	" 6	51	10	58	42·4	40·2
Red Rock	July 16	50½	9	62	42·0	38·4
V.I.S. No. 1	" 8	53½	10	60	41·3	35·5
Velvet	" 22	48	10	57	40·5	42·4
Williamson	" 20	49	10	62½	39·9	35·5**
V.I.S. No. 14	" 22	52½	10	60	39·1	38·0*
Sun	Aug. 3	49	10	60	36·6	37·6
Yeoman	" 12	46	10	61	33·6	33·6
Kanred	July 18	42	9	59	30·3	26·5
Minturki	" 20	49	8	58½	30·0	26·5
Dr. Hart's Durum	" 18	52	8½	60	29·2	23·7
Minhardi	" 23	44	9	59	26·8	24·3
Baldmin	" 16	45	10	62	48·0	
Austan	" 2	46	10	64	46·9	
Canberra	" 23	46	9	61½	46·9	
Major	" 18	49	10	63½	46·9	
Federation x 170	" 25	50	10	63	45·7	
Indian 5 x Telford x Marshall Foch	" 25	48½	10	61	45·7	
Federation x 1414	" 29	46½	10	62	45·5	
Florence x 332	" 16	46	8	61	45·3	
Hard Federation x Marshall Foch	" 29	51	10	61	43·4	
Gluya x Shira	" 27	48	10	62	43·3	
Firbank x Little Club	" 27	58	8	61½	42·0	
Yanward	" 23	50½	9	60	41·7	
Warden	" 25	56½	8	61	40·6	
Federation x Bald Polish	" 26	49	9	61	39·7	
Joffre x Huron	" 26	46	10	61	39·1	
Currawa x 378	" 20	47	10	62½	38·9	
Firbank x V698	" 18	43½	10	63	38·9	
Hard Federation x 170	" 26	49½	10	63	38·6	
Federation x 1414	" 25	48	10	63	37·6	
Cowra 31	" 22	48	10	60	36·6	
Hard Federation	" 18	48	10	60	35·0	
Federation x 129 Currawa	" 18	41½	10	64	34·3	
Firbank x White Lammas x Cedar	" 27	48	10	63	33·4	
Firbank x Yeoman	" 24	51	10	60	33·2	
Comeback x 226 x Nigerian	" 27	50	9	62½	29·3	
Cowra x Natural	" 16	43	10	61	22·8	

*Average for two years. **Average for three years.

In a further test, 39 varieties or strains were compared, using plots of one rod-row each, twelve inches apart, without replication. This test will be continued another year, and those varieties which prove to be promising will then be tested in the regular rod-row plots.

SPRING WHEAT—TEST OF VARIETIES

Nine varieties of spring wheat were sown on May 3. Yields were in most cases above the average.

SPRING WHEAT—RESULTS OF TEST OF VARIETIES

Variety	Date ripe	Length of straw	Strength of straw on scale of ten points	Weight per measured bushel	Yield per acre, 1929	Average yield per acre for 4 years
		in.		lb.	bush.	bush.
Bluestem Marquis	Aug. 28	31	10	62	27·9	*26·9
Dicklow	Sept. 9	26½	10	62	26·8	24·6
Early Red Fife, Ott. 16	Aug. 21	31½	10	64	27·1	29·5
Huron, Ott. 3	" 20	32	10	63	32·4	29·2
Kitchener	" 26	37½	10	62	38·4	32·3
Marquis, Ott. 15	" 24	35	10	64	35·5	29·5
Prelude, Ott. 135	" 13	33½	10	65	30·0	
Red Fife, Ott. 17	" 28	40½	10	63	41·8	30·5
Red Stone	" 26	38	10	61	47·9	30·4

*Average for two years.

Red Fife and Red Stone gave yields far out of proportion to those of the past three years.

OATS, AUTUMN SOWN—TEST OF VARIETIES

Ten varieties of winter oats were sown on September 28, 1928. All varieties came through the winter in good condition, except for some winter killing of the leaf tips in those varieties which have an upright habit of growth. This, however, did not seem to check the growth of the plant, nor affect the yield in any way.

OATS, AUTUMN SOWN—RESULTS OF TEST OF VARIETIES

Variety	Date ripe	Length of straw	Weight per measured bushel	Colour of oat	Yield per acre, 1929	Average yield per acre for four years
		in.	lb.		bush.	bush.
Kanota	July 4	39	38	Red	74·0	49·9
Hardy Prolific	" 8	38	43	Black	64·9	
Early Ripe White	" 6	44	37	White	63·2	38·5
Joanette	" 6	40	40	Black	60·7	45·3
Winter Turf	" 10	41	39	Grey	57·7	48·0
Bountiful	" 12	46	44	Black	52·4	50·8
Plentiful	" 13	47	37	White	44·0	
Grey Winter	" 15	37½	40	Grey	43·2	50·2
Marvellous	" 8	42½	40	White	43·2	46·4
O 713	" 4	49	35	White	34·9	34·9

OATS, SPRING SOWN—TEST OF VARIETIES

Sixteen varieties of oats were sown on May 2 in plots of three rod-rows replicated four times.

OATS, SPRING SOWN—RESULTS OF TEST OF VARIETIES

Variety	Date ripe	Length of straw	Weight per measured bushel	Yield per acre, 1929	Average yield per acre for four years
		in.	lb.	bush.	bush.
Conqueror	Aug. 14	44	43	107·3	64·7
Columbia, Ott. 78	" 14	40½	38	94·0	54·1
Banner, Ott. 49	" 17	42	37	92·3	54·5
O. A. C. 72	" 16	37½	38	79·0	50·4
Victory	" 14	37	37	77·4	57·1
Joanette	" 12	36	37	76·5	53·9
Garton	" 12	38½	36	75·7	54·4
Prolific, Ott. 77	" 12	37¼	37	75·7	52·2
Leader A	" 12	40	34	74·0	50·1
Gold Rain	" 12	47	37	67·3	50·3
Gopher	" 9	33	35	65·7	
Alaska	" 6	40	39	58·2	45·9
Laurel, Ott. 477	" 14	33½	38	40·7	32·4
O. A. C. 3	" 12	36	34	36·6	32·8
O 713	" 10	36	40	30·7	38·6
Star	" 14	36½	41	72·3	*63·5

*Average for two years only.

The yield from all varieties was very much above the average, due to the favourable season and, in some degree, to the soil, the above plots falling on newly cleared land. Conqueror, Victory, and Garton show the best returns over a period of four years.

BARLEY, AUTUMN SOWN—TEST OF VARIETIES

The eight varieties and strains of barley under test were sown on September 29, 1928.

BARLEY, AUTUMN SOWN—RESULTS OF TEST OF VARIETIES

Variety	Date ripe	Length of straw	Strength of straw on scale of ten points	Weight per measured bushel	Yield per acre, 1929	Average yield per acre for four years
		in.		lb.	bush.	bush.
Dean Bros	July 4	42½	10	47	96·1	69·2
Barks	" 12	43½	10	46	79·2	57·4
Bearer, Ott. 475	" 4	46	9	49	68·9	48·8
Duckbill, Ott. 57	" 6	45	10	55	65·4	51·3
Gold	June 30	38	10	56	61·2	*59·5
Himalayan, Ott. 59	" 30	36½	8	64	52·4	36·1
Hulless	" 30	39	8	66	48·3	48·1
Manchurian, Ott. 50	" 8	43½	10	48	44·7	49·5

*Average for 2 years only.

BARLEY, SPRING SOWN—TEST OF VARIETIES

The same varieties and strains of barley as used for autumn sowing were sown on May 2, 1929.

Variety	Date ripe	Length of straw	Strength of straw on scale of ten points	Weight per measured bushel	Yield per acre, 1929	Average yield per acre for four years
		in.		lb.	bush.	bush.
Dean Bros.	Aug. 10	26	10	49	70·7	59·5
Bearer, Ott. 475	" 12	31½	9	48	68·9	51·1
Gold	" 10	26	10	54	69·5	*63·3
Duckbill, Ott. 57	" 12	34½	10	52½	65·4	49·1
Barks	" 21	30	10	48	64·8	50·2
Himalayan, Ott. 59	" 8	22½	9	61	58·9	43·5
Manchurian, Ott. 50	" 10	35	9	48	53·0	50·4
Hulless	" 6	22½	8	59	44·2	36·7

*Average for three years only.

FIELD PEAS—TEST OF VARIETIES

Eighteen varieties of field peas were sown on May 9. Each plot was replicated four times and consisted of two rod-rows 7 inches apart. In each row 100 seeds were planted at an equal distance apart. The distance between each plot was 4 feet.

FIELD PEAS—RESULTS OF TEST OF VARIETIES

Variety	Date ripe	Length of straw	Yield per acre, 1929	Average yield for four years
		in.	bush.	bush.
Arthur, Ott. 18	Aug. 12	35	73·3	64·7
Early Raymond	" 3	35	68·6	69·6
Canadian Beauty	" 16	45½	67·9	67·6*
Chancellor, Ott. 26	" 12	33	65·0	63·9
Stirling	" 12	44	64·8	68·1
Cartier, Ott. 19	" 12	36	64·6	64·4
Prussian Blue	" 22	40	63·6	73·7
Champlain, Ott. 32	" 12	37	62·9	62·1
Golden Vine	" 10	39	61·9	70·3*
Early Blue	" 5	20½	61·5	77·9*
Capital	" 12	33½	60·1	63·3
Mackay, Ott. 25	" 19	39½	60·1	76·1
O. A. C. 181	" 16	39	59·7	68·2
Early Feed	" 5	30½	50·1	76·0*
Maple	" 16	35½	57·9	71·2
Concordia	" 10	22½	55·8	70·9
Gyllen	" 7	28½	53·3	66·1
Solo	" 16	35	51·3	59·4

*Average for three years only.

BARLEY FOR MALTING TEST

Six varieties were received from the Central Experimental Farm at Ottawa to be grown for a malting test. These were sown on May 6 in one-eighteenth of an acre plot. The seed germinated well and the plants made rapid growth, maturing early in August. All varieties were affected with leaf rust and mildew to some extent.

RESULTS OF BARLEY FOR MALTING TEST

Variety	Date ripe	Length of straw	Strength of straw on scale of ten points	Weight per measured bushel	Yield per acre
		in.		lb.	bush.
Star	Aug. 3	42	9	49	75·5
Trebi	" 5	38	7	50	56·7
Plumage Archer	" 14	40	8	52	54·6
Charlottetown 80	" 16	40	7	54	52·5
Hannchen	" 9	34	8	56	46·6
O. A. C. 21	" 5	46	6	49	44·4

Star, Trebi, and O.A.C. 21 are six-rowed. Hannchen, Charlottetown, and Plumage Archer are two-rowed types.

FORAGE CROPS

Eighteen varieties and strains of corn for ensilage were sown on May 11 in rod-rows, 36 inches apart. Each plot was replicated four times. The plots were thinned to 12 inches apart in the row.

INDIAN CORN—RESULTS OF VARIETY TESTS

Variety	Date cut	Yield per acre green weight		Percentage dry matter	Yield per acre dry matter
		1929	Average for		1929
		tons	tons	%	tons
North Dakota	Oct. 9	22·11	6 years 12·63	20·92	4·62
Burr Leaming	" 9	20·78	5 " 16·12	21·75	4·51
Longfellow	" 5	15·29	6 " 13·68	28·17	4·30
Wisconsin x Twichell	Sept. 19	15·84	.....	26·61	4·21
Hybrid	" 25	19·36	4 " 15·56	21·70	4·20
Wisconsin 7	" 25	17·05	6 " 14·66	24·58	4·19
White Cap Yellow Dent	Oct. 2	20·00	6 " 13·10	20·60	4·12
90 day White Dent	" 5	16·99	5 " 15·41	23·73	4·03
Northwestern Red Dent	Sept. 9	12·87	5 " 14·03	27·49	3·95
Amber Flint	" 25	17·49	4 " 11·07	21·14	3·69
Quebec 28	" 9	11·00	6 " 10·47	33·32	3·66
Twichell's Pride	" 9	12·98	6 " 11·51	28·00	3·63
Minnesota 13	" 5	16·39	5 " 12·56	20·58	3·37
Northwestern Dent	" 9	12·87	5 " 12·63	26·07	3·35
Golden Glow (Cookstone Strain)	" 25	11·77	6 " 13·95	26·95	3·07
Pride Yellow Dent	" 14	10·67	5 " 12·76	26·15	2·97
Northwestern Dent (Dakota Strain)	" 6	10·56	5 " 10·65	26·32	2·77
Early Northwestern Dent	" 6	7·37	4 " 11·38	30·59	2·25

The above table is arranged according to the yield of dry matter per acre.

SUNFLOWERS—VARIETY TEST

Five varieties of sunflowers were sown on May 11. The same method of planting was followed as with corn.

RESULTS OF SUNFLOWER VARIETY TEST

Variety	Date cut	Yield per acre green weight		Percentage dry matter	Yield per acre dry matter 1929
		1929	Average for		
		tons	tons	%	tons
Mammoth Russian	Sept. 9	23·32	6 years 24·48	23·06	5·37
Mammoth Russian	Aug. 26	21·34	5 " 22·13	21·12	4·50
Manchurian	" 22	19·25	5 " 13·64	20·62	3·96
Ottawa 76	" 5	10·06	6 " 14·48	14·86	2·38
Mixed Mennonite	" 6	10·34	6 " 11·73	14·37	1·48

GRASSES AND CLOVER

Duplicate plots, one rod square, or one-one hundred and sixtieth of an acre, were used in the experiment. The seed was sown at the rate of 16 pounds per acre.

ORCHARD GRASSES—RESULTS OF TEST OF VARIETIES

—	Height April 15	Height when cut	Date cut	Yield per acre	
				Green	Dry matter
	in.	in.		tons	tons
Svalof Early	6	46	June 5	10·16	3·18
Mowing strain	8½	51	" 5	11·20	3·68
Grazing strain	6	40	" 5	10·00	3·08
Glostrup	9	56	" 5	15·00	5·19
Olsgaard	7½	54	" 5	12·00	3·93
Scandia	7	48	" 5	10·56	3·50
Commercial	8	50	" 5	10·96	3·83

Orchard grass is recommended for use in early pastures. If used for hay it should be cut very early. When left too late the hay is wiry and much waste ensues when fed to stock.

ALFALFA—VARIETY TEST

Four varieties of alfalfa were sown in duplicate plots of uniform size. The seed was sown broadcast at the rate of 20 pounds per acre, May 7.

ALFALFA—RESULTS OF VARIETY TEST

Variety	Height when cut	Date cut	Yield per acre 1929		Average yield dry matter for five years
			Green	Dry	
	in.		tons	tons	tons
Cossack	30	June 4	6·96	2·28	2·76
Variegated	28	" 4	5·50	1·91	2·57
Genuine Grimm	26	" 4	4·40	1·40	2·14
Siberian, yellow flower	12	" 12	2·40	0·77	1·73

Cossack has done well over a period of five years, giving a good yield of both green and dry matter per acre.

RED CLOVER—VARIETY TEST

Five strains of red clover were sown in duplicate plots of a uniform size, at the rate of 20 pounds per acre. The yields were much above the average, due to the presence of abundant moisture in the soil in early season.

RED CLOVER—RESULTS OF VARIETY TEST

Variety	Height when cut	Date cut	Yield per acre 1929		Average yield dry matter for four years
			Green	Dry	
	in.		tons	tons	tons
Chateauguay	28	June 24	21·04	5·32	3·47
St. Clet	30	" 29	18·56	4·35	3·31
Early Swedish	30	July 4	19·52	4·07	3·02
Late Swedish	32	" 11	21·60	4·55	3·01
Kenora	32	" 11	21·20	4·91	2·98

Chateauguay and St. Clet are strains from Quebec and, as in past years, gave the best results.

WHITE DUTCH CLOVER—VARIETY TEST

The three following White Dutch clovers were sown in duplicate plots of one-one hundred and sixtieth of an acre.

WHITE DUTCH CLOVER—RESULTS OF VARIETY TEST

Variety	Source	Date cut	Yield per acre 1929		Average yield dry matter for five years
			Green	Dry	
			tons	tons	tons
Stryno	Danish	June 14	6·54	1·80	1·16
Morso	"	" 14	6·00	1·46	0·99
Wild White	English	" 12	2·40	0·86	
Commercial		" 14	3·76	0·96	

MISCELLANEOUS FORAGE CROPS OTHER THAN GRASSES AND CLOVERS

The object of this experiment was to determine the relative value of Mammoth White Jerusalem Artichokes compared with other forage crops, such as corn and sunflowers. The test plots used were of equal size and replicated four times. Artichokes were planted in rows four feet apart, the tubers being set three feet from each other in the row. The corn and sunflowers were sown in drills three feet apart and thinned to twelve inches apart in the row. The dates of planting were as follows:—

Artichokes, April 26.
Corn and Sunflowers, May 21.

The following table gives the date of harvest, per cent dry matter, and yield per acre of green and dry matter, also the average yield of dry matter for three years.

RESULTS OF MISCELLANEOUS FORAGE CROPS

Variety	Date when harvested	Per cent dry matter	Yield per acre 1929		Average yield dry matter per acre 3 years
			Green	Dry	
		%	tons	tons	tons
Artichoke stalks	Oct. 30	29·15	18·71	5·45	6·01
Artichoke tubers	Nov. 4	21·72	9·12	1·98	2·64
Sunflowers	Sept. 26	19·33	21·45	4·14	4·46
Corn	" 25	23·26	2·10	2·81	2·53

The artichokes were cut as soon as they commenced to bloom, the sunflowers when about two-thirds of the flowers were fully opened, and the corn in the dough stage. The artichokes are much easier to handle at the ensilage cutter than the sunflowers. When comparing the value of the artichokes with other forage crops the tubers must also be taken into consideration. The tubers may be lifted with the potato digger with a minimum of labour. They keep best when left in the soil; if lifted, store in small piles covered with sand and protected from the wind by a wall or building. To store artichokes in large quantities in the bins of root cellars is not practicable, as a very large percentage of the tubers will rot in the course of a month or two.

EXPERIMENTS WITH FERTILIZERS

Work with fertilizers on potatoes has been continued. Chemical fertilizers on Vancouver Island have not given the results that one would look for, due no doubt, in some measure to the lack of moisture in the soil during the summer.

FERTILIZERS FOR THE POTATO CROP

This project was undertaken in the spring of 1923 to determine the influence of nitrogen, phosphoric acid, and potash on the yields of potatoes. Since 1927 the experiment has been made as simple as possible, all plots being one rod square and replicated four times. The plan of the experiment will be clear by referring to the following table:

PLAN OF EXPERIMENT—FERTILIZER FOR POTATOES

Plot	Fertilizer material to pounds per acre	Pounds per acre		
		N.	P_2O_5	K_2O
1	Nitrate of soda 400	62		
	Superphosphate 800	.....	128	
	Muriate of potash 250	.....	.....	125
2	Sulphate of ammonia 300	62		
	Superphosphate 800	.....	128	
	Muriate of potash 250	.....	.....	125
3	Superphosphate 800	.....	128	
	Muriate of potash 250	.....	.....	125
4	Nitrate of soda 400	62		
	Superphosphate 800	.....	128	
5	Nitrate of soda 400	62		
	Muriate of potash 250	.....	.....	125
6	Check (no treatment)			

The check plots were well distributed over the field and placed to include any soil variations that might arise. The results follow:—

TABLE OF YIELDS, FERTILIZER FOR POTATOES

—	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
	lb.	lb.	lb.	lb.	lb.	lb.
A	61	72	68	59	49	49
B	41½	57	48	57½	73	38
C	84	64	60	72	54	58
D	59	65	50	51½	50	41
Totals for 1929	245½	258	226	240	226	186
Average yield per acre 1929	9,820	10,320	9,040	9,600	9,040	7,440
Average yield per acre for three years	11,480	12,000	11,040	11,490	11,380	9,620

In studying the yield for the various plots, it should be noticed that plots 1 and 2 received nitrogen, phosphoric acid and potash, while 3 received no nitrogen, 4 no potash and 5 no phosphoric acid. The nitrogen in plot 2 was supplied in the form of sulphate of ammonia and in plots 1, 4, and 5, as nitrate of soda. In all cases the fertilizer had a beneficial effect. Plot 3, to which no nitrogen was applied, gave the lowest yield of any of the fertilized plots, while plot 2 to which the nitrogen was applied in the form of sulphate of ammonia gave the best yield. The dropping out of any one ingredient, except nitrogen, does not materially affect the yield.

THE RESIDUAL EFFECT OF THE FERTILIZER APPLIED IN 1927 ON THE CLOVER CROP OF 1929

To determine the residual effect of the fertilizer applied to the potato crop planted in 1927, winter oats were sown for 1928 and clover for the 1929 crop. The results obtained from the oats in 1928 are given in the following table:—

RESIDUAL EFFECT OF FERTILIZER ON OATS

—	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
	lb.	lb.	lb.	lb.	lb.	lb.
A	29½	30½	22½	21	22½	20
B	28	41	42	43½	29	31
C	84	43	39	43	36	34
D	35½	51½	30	44	45½	37
Totals	141	166	133½	151½	133	122
Average yield per acre	5,640	6,640	5,340	6,060	5,320	4,880

The clover was sown in February of 1928, and cut July 8, 1929. Each plot was cut and the clover immediately weighed to obtain the green weight. It was then run through the chaff cutter and a two-pound sample extracted from which to obtain the absolute dry weight. The yield in the dry columns of the following table is based on the absolute dry weight, using the percentage of dry matter obtained from the two-pound samples.

YIELD OF CLOVER HAY PER PLOT—1929

—	Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6	
	Green	Dry	Green	Dry	Green	Dry	Green	Dry	Green	Dry	Green	Dry
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
A	129·50	51·72	141·0	54·25	123·50	48·72	131·0	52·96	127·0	49·36	138·0	51·4
B	132·0	49·50	121·50	46·63	131·0	50·01	127·0	53·45	135·0	49·23	125·0	46·62
C	130·0	50·14	113·0	46·23	131·50	53·80	108·50	45·77	118·0	44·94	117·0	43·75
D	115·0	44·47	98·0	41·24	108·0	43·86	133·0	45·45	118·0	45·63	117·0	43·99
Total	506·50	195·83	473·50	188·35	494·0	196·39	499·50	197·63	498·0	189·16	497·0	185·50
Average yield per plot	126·62	48·96	118·37	47·09	123·0	49·10	124·87	49·41	124·0	47·29	124·0	46·37
Average yield per acre	20,256	7,834	18,939	7,534	19,680	7,856	19,979	7,904	19,840	7,566	19,840	7,419

From the above table it will be seen that there was little or no difference in the total yields of clover hay in 1929 from the various fertilizer combinations applied in 1927 for the potato crop. The fertilized plots, on the whole, yielded only a trifle better than the checks.

TIME OF APPLICATION OF FERTILIZER

Fertilizers are applied at planting time, for the most part, throughout Canada, but on the Pacific Coast considerable emphasis is placed on the time of application, it being thought that, owing to the very dry weather that usually follows the planting season that a fertilizer applied a few weeks in advance of planting is more readily taken up by the crop than would obtain at planting time. To ascertain the truth of this, the fertilizer in the preceding experiment was applied to A and B plots at the time of planting and to C and D six weeks before planting time.

FERTILIZER APPLIED SIX WEEKS BEFORE PLANTING

(Yield of Potatoes)

—	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
	lb.	lb.	lb.	lb.	lb.	lb.
A	78	88	67	72	63	62
B	69	74	75	79	68	60
Totals for 1929	147	162	142	151	131	122
Yield per acre, 1929	11,760	12,960	11,360	12,080	10,480	9,760
Average yield per acre for three years	12,060	13,200	10,880	12,280	11,680	9,360

FERTILIZERS APPLIED AT TIME OF PLANTING

(Yield of Potatoes)

—	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
	lb.	lb.	lb.	lb.	lb.	lb.
C	84	64	60	72	54	58
D	59	65	50	51½	50	41
Totals for 1929	143	129	110	123½	104	99
Yield per acre, 1929	11,440	10,320	8,800	9,880	8,320	7,920
Average yield per acre for three years	12,080	11,700	11,680	10,800	8,800	9,840

The check plots received no fertilizer, and in both cases gave a lower yield than those receiving fertilizer.

In 1929 the plots to which the fertilizer was applied six weeks before planting gave an average yield of 11,728 pounds potatoes per acre. Those which received fertilizer at the time of planting gave an average yield of 9,752 pounds per acre. In other words an increase of 0·988 ton of potatoes per acre was obtained by the application of fertilizer six weeks before the time of planting.

In 1927 an experiment was undertaken with Ephos Basic Phosphate to determine its value as a source of phosphoric acid when applied in conjunction with a nitrogenous and potassic fertilizer. For comparison, treatment with superphosphate, basic slag and ground Nauru rock phosphate were included in the plan. There was also one plot which received nitrogen and potash but no phosphoric acid. In past years two crops, mangels and potatoes, were reported on, but owing to the failure of the mangel crop the figures for the potatoes only are given in the following table for the year 1929.

The plots were one rod square and replicated four times.

SOURCES OF PHOSPHORIC ACID EXPERIMENT, WITH POTATOES AND MANGELS

—	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
	lb.	lb.	lb.	lb.	lb.	lb.
	Nitrate of soda.. 200 Ephos..... 292 Muriate of potash 100	Nitrate of soda.. 200 Superphosphate.. 500 Muriate of potash 100	Nitrate of soda.. 200 Basic Slag..... 500 Muriate of potash 100	Nitrate of soda.. 200 Nauru Rock..... 200 Muriate of potash 100	Nitrate of soda.. 200 Muriate of potash 100	Check
	lb.	lb.	lb.	lb.	lb.	lb.
A. Potatoes.....	40	42	40	49	49	42
B. "	42	44	54	42	45	43
C. "	50	52	40	47	50	47
D. "	51	51	44	41	46	40
Total 1929.....	183	189	178	179	190	172
Average yield per acre 1929	7,320	7,560	7,120	7,160	7,600	6,880
Average yield per acre for 3 years.....	7,400	7,600	7,420	7,320	7,680	6,640
Mangels—Average yield per acre for 2 years.....	20,300	21,390	18,080	17,880	16,120	14,000

Differences in yield are so slight that one hesitates to draw conclusions. There seems to be little in any compound containing phosphoric acid to recommend it over others containing the same. The data show that under the conditions of this experiment, there was practically no increase in yield of potatoes but a fair increase in yield of mangels from the application of phosphoric acid.

SUGAR BEET INVESTIGATION

To determine the suitability of the district for sugar beet production, four varieties of beets were planted. The beets were well formed and above the average in size at time of pulling.

The following data are from analyses made by the Division of Chemistry, Central Experimental Farm, Ottawa:—

RESULTS OF SUGAR BEET TEST

Variety	Per cent dry matter	Yield per acre		Sugar in juice	Co-efficient of juice	Average weight of one root	
		Green	Dry				
	tons	tons	tons	p.c.	p.c.	lb.	oz.
Horning	19·90	13·64	2·71	17·53	93·09	2	10
Fredericsen	21·19	11·77	2·49	17·66	88·31	1	14
Rabbethge and Giesscke	18·57	14·14	3·38	17·50	86·08	1	15
Klein Wanzleben	19·31	12·76	2·46	16·77	88·12	3	00

EXPERIMENT WITH DEDOLPH'S FERTILIZER

The object in this test was to ascertain the value of Dedolph's Standard and Special (patented formula) fertilizers, as compared with the ordinary fertilizer of a similar composition. For the purpose of comparison Triangle B was chosen, its analysis being the same as Dedolph's Special in so far as nitrogen, phosphoric acid and potash are concerned. In addition Dedolph's patent fertilizer contains certain compounds, which in the mind of some, give off carbon dioxide in the soil and is taken up as such by the roots of plants. This factor is capitalized by some, and not by others. The fertilizer was used on the potato crop and applied at time of planting, at the rate of 800 pounds per acre. One, one hundred and sixtieth of an acre was the size of the plots used and each treatment was replicated six times.

EXPERIMENT WITH DEDOLPH'S FERTILIZER

Plot No.	Triangle B 3-10-7	Dedolph Special 3-10-7	Dedolph Standard 2-10-2	Check no fertilizer
	lb.	lb.	lb.	lb.
1	52½	60	53	66½
2	43½	54	51	55
3	52	53	70	69
4	72	44½	58	37
5	61	55	57	52½
6	64	53	65	60
	345	319½	354	340

In this experiment, the response of the potato crop to the application of fertilizers has been significant as the check plot gave practically as good a yield as the fertilized plots. It will be noted that the yield obtained from the Dedolph "standard" mixture was larger than that from the "special" although the latter contained considerably more plant food than the former. This would indicate that for some reason, possibly dry seasonal conditions, the crop was unable to obtain full use of the plant food supplied.

POULTRY

Considerable attention is given to poultry keeping, not only on Vancouver Island but throughout British Columbia, in fact greater attention than in many other parts of Canada. Of all the breeds the White Leghorn is the most popular, followed by the Rhode Island Reds, White Wyandottes, and Barred Rocks. Rhode Island Reds increase in popularity with the years. White Wyandottes are kept at the station farm. Considerable work is done of an experimental nature covering incubation, breeding, feeding, housing, egg production and costs.

Owing to an infestation of intestinal parasites, which had given us some concern, the poultry plant was moved to a new location in 1927. One quarter of this area was given to the permanent laying houses. These houses have front and back yards, used in alternate years. The remaining part of the field is run in a three-year rotation, viz., roots, grain, hay. The chicks in all cases are reared on the sod. The straw arising on the grain area is used in the poultry department and the roots or kale used as green feed. In this way the chicks are run over the area once in three years, and the whole plant made as complete in itself as may be.

For the short time this plan has been in operation the results are remarkable. The birds have more vitality, the eggs are of better size and shape, the hatchability and livability of the chicks have greatly improved and the infestation itself reduced to a minimum. Poultrymen are very rapidly changing their methods of poultry keeping—such change being forced upon them through the infestation of intestinal parasites common to poultry yards throughout the country. The three year rotation is recommended by the station as one very effective means of overcoming the difficulty.

The Egg-Laying Contest, as a means of registration of poultry, was conducted at this station as heretofore. Chicken-pox invaded the premises for the first time in 1926 and has come in with one or more pens of contest birds each year since, except the autumn of 1929. No other disease of any importance has given us trouble during later years.

EGG-LAYING CONTEST

The sixth annual Egg-Laying Contest for Vancouver Island completed a very successful year's work on October 23. The general health of the birds throughout the contest year was good. Chicken-pox made its appearance in one pen shortly after the birds came in, but this soon cleared up without spread of the infection.

Of the thirty-four pens entered, twenty were White Leghorns, four Barred Plymouth Rocks, five Rhode Island Reds, and five White Wyandottes. The following table gives the breed average for the 1928-29 contest.

BREED AVERAGE

Breed	Eggs per bird	Points per bird
White Leghorns	204·7	223·9
White Wyandottes	213·3	219·0
Rhode Island Reds	195·8	217·9
Barred Plymouth Rocks	183·9	191·1
All breeds	202·2	218·5

The average egg size obtained was somewhat in excess of that in previous contests. To qualify for registration a bird must lay at least 200 eggs averaging 24 ounces to the dozen. Eggs weighing less than 20 ounces to the dozen are not counted, and eggs weighing 27 ounces or over are considered as 27 ounce eggs. Points are awarded on the following basis:—

Each 27 ounce eggs	1·3
" 26 "	1·2
" 25 "	1·1
" 24 "	1·0
" 23 "	0·9
" 22 "	0·8
" 21 "	0·7
" 20 "	0·6

Position of merit is decided upon points obtained rather than on eggs laid. The following table gives the final placing of the pens in order of merit, contestants, eggs and points for each pen, number of birds from registered dams and number of birds per pen.

Leading bird in the egg-laying contest, 305 eggs, 349.3 points. Owned by R. Mackenzie.

FINAL RESULT OF THE 1928-9 CONTEST

Place	Name	Address	Breed	Eggs	Points	Birds from registered dams	Number of birds registered
1	Dashwood Poultry Ranch	R.R.1, Parksville	W.L.	2,497	2,793·3	9	9
2	Westwood Poultry Farm	Box 91, Duncan, B.C.	W.L.	2,312	2,709·3	7	8
3	R. B. Jeffery	Langford	W.W.	2,355	2,662·3	.....	8
4	T. Barclay	R.R.1, Victoria, B.C.	W.L.	2,416	2,642·7	.....	10
5	J. Burgess	Qualicum Beach	P.I.R.	2,221	2,525·9	.....	7
6	T. H. Hayward	Langford, B.C.	W.L.	2,351	2,489·2	1	9
7	Baise & O'Farroll	Cobble Hill, B.C.	W.L.	2,277	2,461·0	3	6
8	R. Mackenzie	3159 Jackson St., Victoria	W.L.	2,081	2,459·4	2	7
9	O. G. Hunt	R.R. 4, Victoria	R.I.R.	2,054	2,456·9	.....	9
10	W. P. Hurst	Sidney, B.C.	W.L.	1,969	2,365·3	2	6
11	N. E. Plaxton	R.R. 3, Victoria	W.L.	2,043	2,353·8	4	7
12	R. W. Tull	Duncan, B.C.	W.L.	2,088	2,333·0	1	8
13	R. E. Ault	Sandwick, B.C.	W.L.	2,126	2,329·7	.....	5
14	W. A. B. Paul	Comox, B.C.	W.W.	2,287	2,300·3	1	5
15	J. Smyth	P.O. Box 323, Nanaimo, B.C.	W.L.	2,096	2,254·5	.....	5
16	Fortin Leghorn Farm	Sperling, B.C.	W.L.	2,213	2,213·7	.....	5
17	W. L. Douglas	Saanichton, B.C.	W.L.	2,024	2,151·4	5	3
18	Miss E. Gwynne	R.R. 1, Sidney, B.C.	W.L.	1,933	2,114·8	4	3
19	H. D. Reid	306 George Road, Victoria, B.C.	R.I.R.	1,929	2,090·2	4	4
20	Corbett & Tolputt	Pender Island, B.C.	W.W.	2,163	2,084·6	.....	7
21	W. J. Gunn	Courtenay, B.C.	W.L.	1,895	2,073·7	7	4
22	M. S. Stephens	Courtenay, B.C.	B.R.	1,839	2,033·3	2	4
23	C. G. Golding	Qualicum Beach, B.C.	W.L.	2,027	2,029·7	6	5
24	J. J. Dougan	Cobble Hill, B.C.	W.L.	1,886	2,005·0	5	4
25	Experimental Farm	Agassiz	B.R.	2,051	1,996·2	2	4
26	H.H.B. Cunningham	Shawinigan Lake, B.C.	W.W.	1,932	1,994·6	7	3
27	Cooke & Mercer	Ladysmith, B.C.	R.I.R.	1,767	1,969·6	1	4
28	Experimental Farm	Summerland	W.W.	1,926	1,939·0	.....	7
29	C. G. Golding	Qualicum Beach, B.C.	B.R.	1,811	1,919·6	7	1
30	H. G. Scott	Port Washington, B.C.	R.L.R.	1,810	1,853·1	7	2
31	A. Adams	Lake Hill P.O., B.C.	W.L.	1,736	1,813·7	5	4
32	Chaplin & Oswald	Salt Spring Island, B.C.	B.R.	1,654	1,693·1	1	3
33	J. C. Butterfield	Saanichton, B.C.	W.L.	1,563	1,622·1	.....	1
34	A. Georgeson	Albert Head	W.L.	1,417	1,569·4	 2	.....
						95	177

Ten birds constitute a pen with two spare birds, banded as such. These spares are used in the event of casualties. Spares are eligible for registration whether used in the pen proper or not, and are considered in the last two columns of the foregoing table.

Of the birds completing the contest 177 qualified for registration and were tattooed with the "breeders' mark" and the "tattoo number and year letter." Of the birds from registered dams 49 per cent registered, and 48 per cent of those birds not arising from registered stock. In this connection it is well to point out that pens from the Dashwood Poultry Ranch and the Westwood Poultry Farm were composed almost entirely of birds having two generations of registered dams behind them.

Highest Birds for Eggs

1. Bird 3, Pen 15, owned by R. Mackenzie ..... 305 eggs
2. Bird 10, Pen 17, owned by Dashwood Poultry Ranch ..... 299 "
3. Bird 5, Pen 16, owned by N. E. Plaxton ..... 296 "

Highest Birds for Points

1. Bird 3, Pen 15, owned by R. Mackenzie ..... 349·3 points
2. Bird 5, Pen 27, owned by Capt. O. G. Hunt ..... 343·7 "
3. Bird 1, Pen 25, owned by J. Burgess ..... 333·6 "

BREEDING

The various lines of breeding work such as breeding for production, for egg size, for egg shape, for vitality in the dam and her offspring have been carried on as heretofore. Last year we said that though all these were important, emphasis should be placed on vitality, for without it all else must

fail. That progress has been made here may be judged by the fact that the number of eggs necessary to produce one healthy chick has been cut in half during the past three years. In breeding for egg size as a definite project during 1929 the male used, G175, had four generations of birds behind him laying 247 eggs or better. The production of his daughters, and especially egg size, are full of interest. One thing is evident: the egg size of the Wyandotte, the most difficult breed on earth from the breeder's point of view, may be increased in size, and that 24-ounce eggs, and better, may reasonably be looked for.

BREEDING FOR EGG SIZE

Sire	Sire dam's egg size	Sire dam's egg production	Dam's leg band number	Dam's egg size	Dam's production	Daughter leg band number	Daughter production	Daughter egg size
	oz.			oz.				oz.
G 175.....	25	228	A 322	26·7	256	M 160	256	25·0
G 175.....	25	228	A 322	26·7	256	M 166	308	25·0
G 175.....	25	228	A 322	26·7	256	M 231	190	25·0
G 175.....	25	228	D 348	24·5	216	M 151	249	24·0
G 175.....	25	228	D 348	24·5	216	M 167	250	22·0
G 175.....	25	228	D 348	24·5	216	M 189	195	22·0
G 175.....	25	228	D 348	24·5	216	M 216	225	25·0
G 175.....	25	228	H 214	24·0	214	M 22	231	24·0
G 175.....	25	228	H 214	24·0	214	M 102	246	27·0
G 175.....	25	228	H 214	24·0	214	M 152	230	29·0
G 175.....	25	228	H 214	24·0	214	M 165	270	24·0
G 175.....	25	228	H 214	24·0	214	M 168	240	21·0
G 175.....	25	228	H 214	24·0	214	M 211	259	18·0
G 175.....	25	228	H 214	24·0	214	M 217	236	24·0
G 175.....	25	228	H 214	24·0	214	M 223	215	26·0
G 175.....	25	228	H 214	24·0	214	M 233	181	26·0
G 175.....	25	228	H 214	24·0	214	M 236	189	24·5
G 175.....	25	228	H 214	24·0	214	M 239	197	22·0
G 175.....	25	228	H 214	24·0	214	M 289	222	26·0
G 175.....	25	228	H 214	24·0	214	M 292	214	25·0
G 175.....	25	228	K 6	24·0	252	M 12	240	25·0
G 175.....	25	228	K 6	24·0	252	M 232	210	24·0
G 175.....	25	228	K 29	24·5	249	M 7	259	22·0
G 175.....	25	228	K 29	24·5	249	M 154	226	25·0
G 175.....	25	228	K 29	24·5	249	M 163	229	26·0
G 175.....	25	228	K 29	24·5	249	M 208	242	26·0
G 175.....	25	228	K 128	27·0	271	M 169	245	22·0
G 175.....	25	228	K 128	27·0	271	M 257	194	24·0
G 175.....	25	228	K 164	27·0	224	M 81	185	26·0
G 175.....	25	228	K 164	27·0	224	M 288	193	27·0
G 175.....	25	228	K 164	27·0	224	M 135	233	26·0
G 175.....	25	228	K 308	25·0	221	M 11	255	28·0
G 175.....	25	228	K 308	25·0	221	M 51	244	25·0
G 175.....	25	228	K 308	25·0	221	M 155	277	24·0
G 175.....	25	228	K 308	25·0	221	M 188	207	21·0
G 175.....	25	228	K 308	25·0	221	M 261	245	22·0

It will be noticed that there are some "ups" and some "downs," but the table is a good illustration of what may be accomplished by breeding through systematic and prolonged endeavour.

All breeders of Wyandottes have been perplexed over the number of single combs occurring in Wyandotte chicks, even when the breeding pen had been carefully selected for generations. As rose comb is dominant to single comb, it would seem that a male bird, entirely true as to rose comb, should transmit the rose comb to the progeny, regardless as to whether the dams were true or not. To test the reliability of the theory several Wyandotte cockerels were mated to Rhode Island Red single-comb pullets before the regular hatching season. The resulting chicks were very carefully examined. Single combs were found arising from some of these matings. It is interesting to note that

in the case of two cockerels, dominant as to rose comb, no single combs were found among the Wyandotte chicks, numbering hundreds, throughout the season. It would seem, however, that a very large percentage of Wyandotte cockerels are not "true" in so far as rose comb is concerned.

BEST DATE FOR INCUBATION

The incubation of chicks on Vancouver Island usually begins in February and is complete by the end of April. The date fixed as the best time to incubate in Eastern Canada does not apply on the Pacific Coast. In an effort to determine the best date of incubation to secure maximum hatchability and livability this project was begun in 1922. In a general way it has been noticed over the whole period that late-hatched chicks lack in vitality and mature slowly, as compared with those hatched in earlier season. The following table sets forth results obtained through the 1929 season:—

RESULTS OF DATE OF INCUBATION TEST

Time set	Total number of eggs	Number of chicks	Number of chicks alive when wing banded	Per cent alive when wing banded	Total eggs required for 1 chick hatched	Total fertile eggs required for 1 chick hatched	Total eggs required for 1 chick alive when wing banded
March	690	331	330	100	2·0	1·2	2·0
April	725	403	383	95	1·8	1·6	1·8
May	110	71	55	77·4	1·5	1·1	2·0

During the season a new Buckeye (No. 41) electric mammoth incubator was installed at the station. The above results are based on hatches obtained with this machine. The results are satisfactory not only from the standpoint of number of chicks hatched, but from that of vitality and livability. A Jubilee incubator was used for the last three days of incubation, for a part of the eggs set, in order that pedigree work might be more expeditiously and effectively carried on.

COST OF EGG PRODUCTION

Detailed statements of costs have been published year by year, determined month by month. The following table gives a summary of this work for eight years:—

SUMMARY OF COST OF EGG PRODUCTION INVESTIGATION

Items	1925	1927	Average for eight years
Average production per bird	199·1	196·8	190·14
Pounds of grain and mash per dozen eggs	5·16	5·3	5·81
Cost of feed per dozen eggs	18·8c.	14·2c.	
Month of highest cost	December	July	
Month of lowest cost	April	April	
Month of highest production	April	April	
Month of lowest production	January	January	

RELATION OF BODY WEIGHT TO EGG PRODUCTION

White Wyandottes	Body weight 4½ to 5 pounds	Body weight 5 to 5½ pounds	Body weight 5½ to 6 pounds	Body weight 6 pounds and up
Production—eggs	172	201	216	251
"	226	204	164	257
"	258	227	272	233
"	161	206	229	212
"	178	188	216	216
"	.....	219	198	229
"	.....	156	188	237
"	.....	224	198	156
"	.....	225	135	258
"	.....	215	211	219
"	.....	232	247	205
"	.....	.....	153	249
"	.....	.....	203	198
"	.....	.....	201	252
"	.....	.....	220	279
"	.....	.....	285	
"	.....	.....	265	
"	.....	.....	258	
"	.....	.....	228	
"	.....	.....	176	
"	.....	.....	119	
"	.....	.....	240	
Total	995 eggs	2,297 eggs	4,622 eggs	3,451 eggs
Average production	199 "	208·8 "	210 "	230 "

For many years fineness in Wyandottes was looked for. For five years since the birds have been observed from this viewpoint, as weight goes up production goes up. We believe that that always follows—the heaviest production will be found among the heaviest birds in so far as Wyandottes are concerned.

EFFECT OF GREEN FEED ON EGG SIZE

The factor or factors influencing egg size are not easily arrived at. When one speaks of a 24 ounce egg hen, he knows that that hen may have periods when she lays 23 ounce eggs; other periods when eggs run 25 ounces to the dozen. It follows that factors other than breeding enter into the problem. Beef scrap, fish meal, green feed and many other food products have been given the credit. For a number of years we have tried to determine the effect of green feed on egg size alone, and in combination with cod liver oil. The ordinary Sidney ration was used plus green feed and cod liver oil as under.

EFFECT OF GREEN FEED ON EGG SIZE

Pen number and feed received	Average egg weight for 10 months	Number of birds	Average egg production for 10 months
	oz.		
Pen 1—green feed	23·4	34	143·1
Pen 2—cod liver oil and green feed	23·8	36	183·1
Pen 3—cod liver oil	22·0	40	163·0

It will be noticed that neither green feed or cod liver oil, used singly, has the same effect in either production or egg size that the combination of the two had. This follows our findings of other years. Green feed and oil both have a place in poultry feeding, but neither one can replace the other.

HOME MIXED GRAIN AND MASH VS. COMMERCIAL GRAIN AND MASH

Commercial feeds are on the market in great number. Practically all feed merchants have their own. As to the relative merits of these, or the superiority of any one over the home mixed is a matter of constant debate among poultrymen. For six years these commercial feeds have been used against the home mixed at the Sidney Experimental Station. Wyandottes of the same breeding have been used, treatment in all cases being the same except in the matter of feed. During the time of these tests commercial feeds as sold by Brackman & Ker, Vancouver Milling Co., Vernon and Buckerfield, Scott & Peden and Sylvester Feed Co. have been tried. During 1929 a special feed offered by Vernon & Buckerfield known as Egg Maker, has been fed. As the reports were made on the years work for the past six years, we have, in a general way, said that the Sidney ration (home mixed) cost more than the commercial feeds but that the cost of one dozen eggs shows to the advantage of the Sidney feed. In favour of the commercial feed it should be said that at the beginning of the project there is usually a falling-off in egg production, due apparently to the change in feed. Thus the cost of the commercial feed appeared unduly high. Results as obtained with "Egg Maker", product of Vernon & Buckerfield, for the year 1929 follows:—

HOME MIXED VS. COMMERCIAL FEED

Month	Number of eggs laid		Pounds of feed used, scratch		Pounds of feed used, mash		Feed cost		Feed cost per dozen eggs	
	Home mixed	Commercial	Home mixed	Commercial	Home mixed	Commercial	Home mixed	Commercial	Home mixed	Commercial
	eggs	eggs	lb.	lb.	lb.	lb.	cts.	cts.	cts.	cts.
December	8·0	10·8	4·5	3·5	5·0	3·0	27·8	20·2	41·7	22·4
January	8·8	6·8	3·0	4·0	3·0	3·0	17·6	20·5	24·0	40·3
February	11·2	7·3	3·0	3·0	3·5	3·0	19·4	18·7	20·8	30·7
March	20·0	22·7	2·7	2·0	3·3	2·5	17·3	13·7	10·3	7·2
April	12·6	22·5	2·8	2·5	2·8	2·5	16·9	16·0	16·1	8·5
May	15·8	16·3	3·3	3·5	3·3	3·0	18·7	20·1	14·2	14·8
June	16·0	14·8	3·3	2·5	3·3	2·5	19·7	15·2	14·7	12·3
July	16·2	16·2	3·3	3·0	3·4	3·0	20·0	18·7	14·8	13·8
August	11·2	15·9	3·4	3·0	3·3	3·0	19·6	18·7	21·0	14·1
September	13·6	13·4	4·4	3·5	4·0	3·5	24·6	21·0	21·7	18·8
Totals	133·4	146·7	33·7	30·5	34·9	29·0	201·6	182·8	19·9	18·2

NOTE.—Cost of feed includes, besides mash and scratch feed, shell and green feed which are not shown.

It will be noticed that though 10 birds constitute the pen in question, "production," "pounds of beef," "feed cost per dozen eggs," etc., are based on average per bird. We wish also to point out that the commercial feed in this case has shown itself superior to the home mixed in every way. The work has been continued with the same feeds for another year.

OYSTER SHELL VS. OTHER FORMS OF LIME AND GRIT IN POULTRY FEEDING

Clam shell grit is in common use on Vancouver Island, yet many poultrymen prefer oyster shell. A few have been asking "why not limestone grit?" Analysis would show all three as very similar in composition, and composed almost entirely of calcium carbonate (CA CO_3). One of the three forms of lime is usually obtained with ease in nearly all parts of the country, while the other two may not be. To determine the relative importance of the three the project was undertaken in December, 1928.

OYSTER SHELL VS. OTHER FORMS OF LIME AND GRIT SUBSTITUTES

Months	Strength of shell		
	Oyster shell	Clam shell	Limestone grit
	lb.	lb.	lb.
December	10·0	10·25	10·0
January	9·5	12·0	10·25
February	12·25	10·5	9·0
March	10·5	9·75	8·5
April	11·25	8·25	8·0
May	9·0	8·5	8·0
June	10·0	9·25	7·0
July	9·75	8·0	7·5
August	10·0	9·0	7·0
September	9·25	9·0	6·0
Average	10·2	9·4	8·1
	No.	No.	No.
Eggs per bird for 10 months	183·1	163·3	143·1

The three pens were fed in the same way except for change in the lime grit. The strength of the shell was determined by special apparatus measuring the pull necessary to break the shell. Oyster shell, based on one year's work, has demonstrated its worth both in strength of shell and production. Work is being continued.

BEST KIND OF LITTER

As is well known, straw is in the most common use as poultry litter, yet straw requires frequent change, and is expensive in some parts of Canada. To determine the best and most economical type of litter this project was undertaken one year ago. Peat moss is abundant in British Columbia and is coming on the market at present in quantity, hence peat moss was compared with straw during the past year. Peat moss is supposed to take up moisture given off by the poultry, to absorb odours, thus keeping the houses in a sanitary condition for long periods, much longer than is possible with straw, and to abolish the dust menace in some measure. Summary of result for one year is here given.

BEST KINDS OF LITTER

Items		Straw	Peat moss
Duration of test	mos.	10	10
Number of birds in pen		40	40
Value of feed used, per bird	$	1 95	1 95
Eggs laid, per bird	eggs	163·9	160·3
Value of eggs, per bird	$	4 03	3 92
Feed cost per dozen eggs	cts.	14·4	17·1
Amount litter used	bales	15	4
Total cost of litter	$	8 25	12 00
Cost of litter, per bird	cts.	20·6	30
Labour charges in changing litter	$	3 50	0 70

The straw has maintained its standing for the year as will be seen, but in fairness to the peat moss litter it should be mentioned that the birds had been on straw before the beginning of the test, and that when the change was made there was a distinct falling off due to the change. Results might be different at other times. Work is being continued, taking the birds directly from the range and placing them on the litter. There was considerable saving in time in changing litter and less mortality, as 6 to 2 in favour of the peat, but other factors were unfavourable.

VITAMINE FEEDS FOR WINTER EGG PRODUCTION

The value of green feed in winter egg production is well known, but it is a most difficult thing to obtain at certain seasons. Other feeds, such as yeast and cod liver oil have been on test to determine whether any one of these would supply the vitamines necessary when green feed is difficult to obtain. During the past year, green feed and cod liver oil singly, and the two in combination have been on trial. Results for the year follow:—

VITAMINE FEEDS FOR WINTER EGG PRODUCTION

Month	Cost of feed per bird			Eggs laid per bird			Value of eggs per bird			Cost of feed per dozen eggs per bird		
	Green feed	Cod liver oil	Green feed and cod liver oil	Green feed	Cod liver oil	Green feed and cod liver oil	Green feed	Cod liver oil	Green feed and cod livor oil	Green feed	Cod liver oil	Green feed and cod liver oil
	cts.	cts.	cts.	eggs	eggs	eggs	cts.	cts.	cts.	cts.	cts.	cts.
December	22·4	22·5	27·1	9·2	16·7	17·2	20·5	54·0	55·7	29·1	16·1	18·9
January	18·3	21·6	17·9	8·0	6·7	11·7	16·0	14·0	24·3	27·4	38·7	18·2
February	21·2	22·8	21·9	11·7	12·1	15·6	30·5	30·0	37·0	21·7	22·6	16·9
March	18·8	23·0	20·8	18·1	20·0	20·8	36·5	40·3	41·9	12·4	13·8	12·0
April	24·2	22·8	23·2	16·5	19·3	21·8	28·6	33·4	37·7	17·6	14·1	12·6
May	23·5	24·0	26·9	18·0	19·1	20·7	32·7	34·7	37·6	15·6	15·0	15·2
June	20·0	27·4	30·1	17·1	17·7	18·9	42·5	43·9	46·9	14·0	18·5	19·0
July	22·2	21·6	20·4	16·0	15·9	20·2	34·0	33·8	42·9	16·6	16·3	12·1
August	14·9	23·2	16·2	15·2	18·5	18·3	43·7	52·4	52·6	11·7	15·0	10·6
September	17·9	20·1	19·7	13·3	17·3	17·9	52·1	67·7	70·1	16·1	13·9	13·2
Total	203·4	229·0	224·2	143·1	163·3	183·1	346·7	404·2	446·7	18·2	18·4	14·8

A combination of cod liver oil and green feed has again demonstrated its worth, but we do not conclude that oil may entirely take the place of green feed.

INTESTINAL PARASITES IN POULTRY

As hinted in our introduction, intestinal parasites gave us much trouble for several years, but under our present system the menace has automatically adjusted itself. In establishing a poultry plant in the earlier days a stumpy field, a ledge of rock, etc., was given to the poultry runs. All of this has been found wrong in principle as such locations are sure to become infested with intestinal parasites, and unfit for poultry keeping. Poultry can be successfully handled on good arable land only. This land, of considerable size, in a three year rotation, rearing the chicks on the sod only and keeping the birds off the other sections of the field *absolutely* works wonders. Carelessness at any step may undo the work of years. For example, chicks may get through the fence, the poultryman may tramp over the fields and carry contagion on his boots, etc. Precaution at every step is necessary. However, chicks so reared on clean fresh land, and carried to the laying sheds with front and back yards, demonstrate by their vitality and production that their reserve strength is sufficient to meet minor attacks of germs or parasites.

BACILLUS PULLORUM INFECTION OF POULTRY

For a number of years all of our breeding stock has been subjected to the blood test for bacillus pullorum. Nearly all poultrymen know what this disease means during the first ten days of the young chick's life, and what it can do, at least for some period of their poultry experience. The disease may be cleaned up entirely by seeing to it that there are no carriers of this disease in the breeding stock. If diseased, these breeders should be slaughtered if it takes the finest stock. Once done, chicks may be reared normally and with little loss. All of our breeding stock for the coming season has been tested and found one hundred per cent clean. To poultrymen who are troubled with either bacillus pullorum in chicks or intestinal parasites in their poultry, we wish to make it emphatic that the remedy has been found and that the difficulty may be cradicated.

APIARY

Flowers are everywhere and continue over a long period on Vancouver Island, but real honey plants are not in sufficient quantity to carry any great number of colonies of bees, hence bees are kept at this station more for the sake of demonstration, than as a commercial enterprise. The number of colonies varies from time to time, but the work at the "out-apiaries," of which there were several at one time, has been discontinued.

The winters are mild and the springs changeable, bringing about a considerable amount of spring dwindling. It is very easy, in a country like this, to overstock a given area. We are convinced that this locality will not maintain a great number of colonies until the amount of pasturage is increased. It is our intention to use the apiary at the station for study and demonstration mainly.

The colonies at the Experimental Station, Sidney, are all run for extracted honey. All colonies are wintered outside in Kootenay cases. As soon as weather conditions permit in the spring, colonies are examined, and strength, quantity of stores and condition of brood nest are noted. Thirty-three per cent sugar syrup is fed where needed, and weak colonies are strengthened by frames of brood and bees from stronger colonies. All colonies are examined about every nine days, watch being kept for queen cells, and every facility given to induce the queen to lay.

The mildness of the winter, in some respects, is a great drawback from the beekeeper's standpoint. It is quite impossible to keep the bees in the cluster for any length of time, for every bright day they fly and are chilled before they can return, due to climatic conditions.

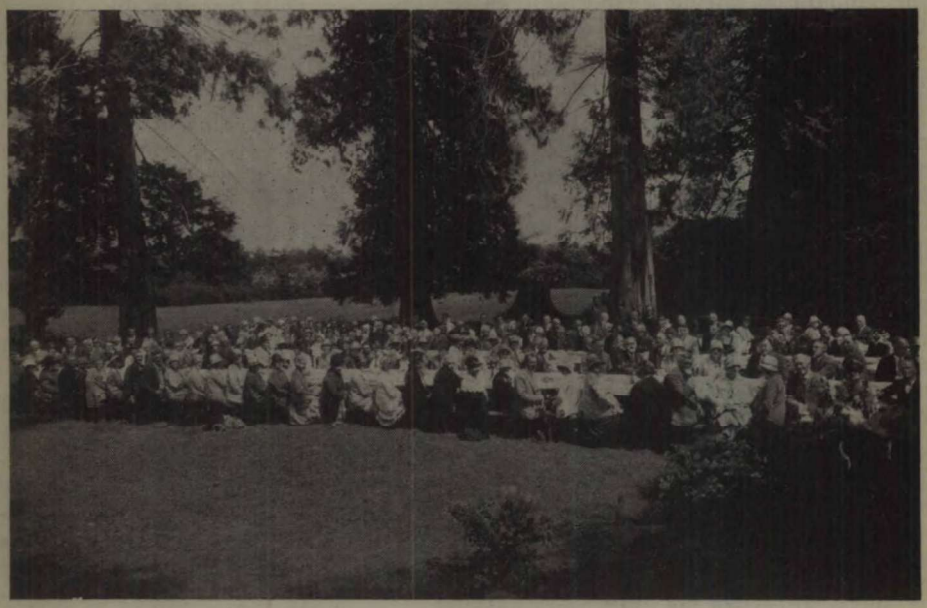
The dearth of honey plants on the Saanich Peninsula renders spring feeding imperative until the maple trees come into bloom, and from that time onward bees are able to maintain themselves until the time of white clover, when whatever surplus there may be is gathered. If extracting is done in July and bees are deprived of their stores, close observation must be maintained, as from this time onward they will not be able to do much more than gather enough to maintain themselves. Feeding for winter is commenced about September, as October is often very damp and prevents the bees maturing the syrup fed to them. Unmatured stores will result in mildewed combs and loss of bees from dysentery during the winter. In 1926 foul brood was discovered in the apiary for the first time. Every effort was made to clean up the difficulty, yet in 1927 a few cells containing diseased brood were found in one hive. Since that time foul brood has been discovered in several places on the Island, both American and European. Though not so common as on the mainland of British Columbia, we are satisfied that the malady is common enough. Beekeepers are advised to be on the look-out, for repeatedly foul brood has made its appearance in the most unlooked-for situations. Among possible sources of contagion may be mentioned discarded honey tins or jars, bee trees, cages that have been repeatedly used, as well as candy and syrup coming with bees purchased by the pound. The future demands greater care on the part of the apiarist if the various brood diseases are to be held in check. During 1928 foul brood was again discovered in two hives, not serious cases, for the difficulty was discovered before the disease had advanced far. The source of contagion is the problem. We are satisfied that the difficulty came to us in the first instance with package bees, but since that time, knowing the care that has been exercised at every step, some outside source of infection must be looked for, but has not been found.

The work in this department has been curtailed, as it has been found quite impossible to find a qualified man, but we hope that this condition may not continue for long.

GENERAL NOTES

NEW BUILDINGS

Considerable building was undertaken and completed during the year. The new pathological laboratory is now occupied, and plant disease investigations being carried on under the supervision of Dr. William Newton. The laboratory is complete in itself, and is equipped as few other plant disease laboratories on this coast are. The new cottage has been completed and is now occupied by Dr. Newton. An extensive addition to the fruit house was completed in early season. This addition houses the new dehydrator, canner, etc.



A horticultural meeting on the Sidney Station.

EXCURSIONS AND PICNICS

As usual our park and grounds have been used in the entertainment of a number of organizations visiting the farm. The Minister of Agriculture, Mr. Motherwell, addressed the members of the Canadian Club to the number of about two hundred at the time of his visit. The high school agricultural class, as usual, spent one day at the farm and were entertained by demonstrations of an agricultural nature. The day terminated at the park. The Vancouver Island Horticultural Association also visited the farm and were entertained at luncheon. These have been our major endeavours for the year in this line. In addition a number of church organizations and others have used our grounds.

PUBLICATIONS

The annual report outlining in some measure, all the work we do, has received its usual attention. The circulation of this report is wide and is appreciated by an increasingly large number of farmers and others.

IMPROVEMENTS, WATER, ETC.

Considerable time has been given to the water situation, from which, or the need for it, the whole section usually suffers much. A new artesian well was drilled and a fairly abundant supply of water obtained. Water has also been taken to the landscape garden area, which we hope will be of considerable use in maintaining the spring loveliness of the area to a much later season.

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