DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

DIVISION OF HORTICULTURE

INTERIM REPORT OF THE DOMINION HORTICULTURIST

W. T. MACOUN

FOR THE YEAR 1921

Lilac Walk in Lilac Time.—Central Experimental Farm, Ottawa, Ont.

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REPORT OF THE HORTICULTURAL DIVISION

W. T. MACOUN, DOMINION HORTICULTURIST

This is the thirty-fifth annual report of the Horticultural Division.

It does not deal in a full and detailed way with the year's results in every project and every experiment in horticulture carried on. It was desired to make the report as readable as possible, giving at the same time a clearer conception of some of the main lines of work in horticulture and the results obtained therefrom over a period of years, than would have been possible had simply the details of each experiment, for the past year only, been given. Succeeding reports and bulletins, as issued from time to time, will deal fully with those various projects and experiments and their results, which have only been mentioned briefly herein.

THE SEASON

There was an early spring in 1921, the frost being out of the ground sufficiently to dig on April 1, eleven days earlier than the average for twenty-four years, which is April 11. April was a moderately warm month and the last spring frost occurred on the 18th, when the temperature was 26° F. May was a warm month, the latter part being exceptionally warm, as from the 20th until the end of the month it was over 80°F. on six days, the highest temperature being on May 1st when it was 94·8°F. Vegetation seemed about two weeks further advanced than usual by the end of May. June was a very warm month with a temperature over 80° on sixteen days. The warmest day was the 22nd, when it was 98·4°F. July was hot and very dry. The temperature was above 80° on every day but one, when it was 78°. It was above 90° on fourteen days, and the hottest day of summer occurred on the 13th, when it was 96·6°F. August was a moderately warm to warm month. The temperature was above 80° on ten days, and was 89° on the 10th and 30th. September was also a warm month for the season of the year with a temperature of 91·8° on the 2nd and above 80° on seven days.

The precipitation during the whole growing season was very light, and it was not until the month of October that the ground became really wet enough. The first frost since April 18 occurred on October 9, when the temperature was 28°. The next frost was on the 13th, when it was 29·6°. These frosts injured tender plants, but it was not until October 26th that the first killing frost occurred, when the temperature dropped to 24°. This is one of the longest periods without killing frosts recorded since the Experimental Farms were established. There were no temperatures below zero in November. Snow came early, there being a fall of five inches on the 5th, increasing to fourteen and a half by the 15th. This, however, went practically all away again by the 19th, when the temperature rose to 62·4°F. The ground froze up on November 23, which is the date when winter may be said to have set in. The average date for winter to set in for the past twenty-four years is November 25. There were five inches of snow on November 24, but this went away by December 3, and until December 16 the ground was practically bare, and as tested on December 17, had frozen to a depth of seven inches. It was feared that strawberries and bulbous plants might have suffered before or after this time as there continued to be relatively little snow protection until January. It was a moderately cold winter with no great depth of snow at any time, there being probably fifteen to eighteen inches when it was deepest. The lowest temperature in December was −14·2° on the 22nd; in January −20° on the 24th; in February −22·4° on the 17th. This was the lowest temperature of the winter. It was below zero on twenty-nine days during the winter of 1921-22. Snow began to go perceptibly on March 4, and by the 14th the ground was practically bare. There was another light snowfall on the 20th, but the ground was again bare by the 24th.

FRUITS

BREEDING NEW VARIETIES OF APPLES

The breeding of new varieties of apples continues to be an important part of the work of the Horticultural Division, as it is believed that there is great need for better varieties for special climatic conditions in Canada. In originating apples, the needs of the prairie provinces are being constantly kept in mind as climatic conditions there demand the hardiest varieties that can be obtained. At the Experimental Station, Morden, Man., there has been brought together probably the best collection of hardy apples and crab apples in America, many of these having been originated at Ottawa. Some fruited at Morden in 1921, and those considered promising will be propagated there and distributed for test on the prairies.

Perhaps the greatest need is for better winter apples for those parts of Canada where the fruit industry is an important one; improvement over the varieties now being grown is much desired as each one of them has some serious fault. There is also great need for hardy winter apples of good quality for those parts of Canada where the climate is somewhat similar to that at Ottawa. It is such districts that much of the work at Ottawa carried on during the past twenty-five years has been designed to serve. To show the progress which has been made, it may be stated that when the work began there were only about five winter apples, all below good in quality, that could be called hardy at Ottawa, whereas now, as a result of breeding work, there are over 200 hardy varieties, the fruit of which will keep all winter. These are being sifted out from year to year, and among these and many others coming on, it is expected to obtain the much-sought desirable winter sorts.

Many excellent summer and autumn varieties have been originated at Ottawa, a few of which have been tested long enough to warrant their propagation and introduction. These are now offered for sale by the Horticultural Division and will continue to be sold until they can be obtained in large numbers from nursery firms. These are the Melba, Joyce, Patricia and Pedro. A winter seedling of Wealthy, the Mendel, is also being propagated for sale.

The varieties of apples in commerce to-day have been obtained, mainly by chance, during the past three hundred years. Seedlings grew up along the fences or roadsides or occasionally were planted. Those of the greatest promise were propagated, and thus, one by one, often at long intervals, the important varieties now in commerce were added to the list of recommended sorts. To-day there are many workers systematically breeding new apples, and it is expected that there will be a much greater change in the popular varieties in the next fifty years than there has been in the past fifty.

In the work at Ottawa, no less than seventy-one varieties have been used as parents, and the number of combinations made with these has been two hundred and one. Of these, there has been fruit from the following parent varieties: American Golden Russet, Anis, Anisim, Antonovka, Baxter, Bethel, Duchess of Oldenburg, Dyer, Fameuse, Forest, Gano, LaVictoire, Langford Beauty, Lawver, Lowland Raspberry, McIntosh, McMahan, Malinda, Milwaukee, Newton, North Western Greening, Northern Spy, St. Lawrence, Salome, Scott Winter, Shiawassee, Stone, Swayzie, Walbridge, Walton, Wealthy, Winter Rose, Winter St. Lawrence—33 varieties.

ESTIMATED LENGTH OF TIME REQUIRED TO ORIGINATE, FRUIT, AND POPULARIZE A NEW APPLE OF MERIT

It takes a long time from the crossing of two varieties of apples and the sowing of the seed from the resulting cross until a tree grown from such seed has fruited and, if of merit, has been propagated and been planted in large numbers by fruit growers. It takes still more time until the fruit of such a variety is produced in large quantities and is known and asked for by the consumer.

Following are the various stages through which a good new variety must pass from the sowing of the seed until it becomes a popular sort:—

From sowing seed to planting trees in fruiting rows	3 years
From planting to bearing	5 "
From bearing to confirming characteristics of fruit	5 "
From propagation to planting in orchard	3 "
From planting propagated trees in orchard to fruiting of the same	6 "
If approved by nurserymen, time for nurserymen to build up a stock for sale	3 "
From time of sale until trees are in full bearing in fruit orchards	10 "
To popularize fruit after it is available	5 "
Total	40 years

NEW VARIETIES OF APPLES NAMED IN 1921

Following are descriptions of three varieties of apples named in 1921:—

Lawfam (Lawver x Fameuse).—Fruit of medium size; form roundish to oblate conic; cavity open, medium depth, russeted at base; stem medium length, moderately stout; basin medium depth and width, wrinkled; calyx open; colour yellow well washed with deep, attractive crimson; predominant colour deep crimson; seeds medium size, acute to acuminate; dots obscure; skin moderately thick, moderately tender; flesh yellowish with traces of red; crisp, moderately juicy to juicy; core medium to small, open, flavour subacid, pleasant; quality good; season probably late December to March. No marked resemblance to Lawver. Resembles McIntosh in colour. No marked resemblance to Fameuse, although colour is suggestive of dark-coloured Fameuse and there is a faint flavour of Fameuse.

Lowbeth (Lowland Raspberry x Bethel).—Fruit above medium to medium size; form roundish conic, ribbed; cavity open, medium depth, wrinkled; stem medium to long, moderately stout; basin medium depth, medium width, wrinkled; calyx closed; colour pale yellow washed and splashed with orange red; predominant colour orange red; seeds below medium to small, acute; dots obscure or russeted; skin moderately thick to rather thin, tender; flesh dull white, faintly tinged with red, tender, juicy; core large, open; flavour subacid, pleasant; quality good; season mid-August to October. No marked resemblance to Bethel but flesh is much like Lowland Raspberry and flavour somewhat similar. Attractive in appearance. As good or better than Lowland.

Miltosh (Milwaukee x McIntosh).—Fruit medium to above medium size; form roundish, slightly ribbed but regular; cavity narrow, medium depth; stem short, stout; basin open, medium depth to deep, wrinkled; calyx partly open; colour yellow, washed and splashed with crimson; predominant colour crimson; seeds below medium, plump, acute, most of seeds abortive; dots moderately numerous, white, distinct; bloom thin, pinkish; skin moderately thick, moderately tough; flesh dull white or yellowish, firm, crisp, juicy; core medium, open; flavour subacid, pleasant, not high; quality above medium to good; season December to March or later. No resemblance to Milwaukee. No marked resemblance to McIntosh, resembles Fameuse considerably in shape and colour. This is an attractive-looking apple and a good keeper.

THE POLICY OF THE HORTICULTURAL DIVISION WITH REFERENCE TO THE DISTRIBUTION OF FRUIT TREES AND BUSHES AND PLANTS

Free Distribution.—In order to have new varieties thoroughly tested before they are recommended for general introduction, it is the policy of this division to distribute, free of charge, each year, to those persons applying for same previous to March 15, specimens of the sorts which require further testing. It is not always that material of all the different kinds of fruit is available, as one year there may only be apple trees to distribute, while during another season the distribution may be confined to bush fruits. Well-known commercial sorts, such as the McIntosh apple, Herbert raspberry and Parson Beauty strawberry, are not distributed, as these may be obtained from any nurseryman.

The Division does not assume any responsibility as regards the success of the sorts distributed for trial purposes. The sole object of the distribution is to test out varieties of unknown worth, so recipients should not be disappointed if these do not measure up to standards already set.

Sale of Varieties.—As soon as new introductions have been determined, by extended trial, to be worthy of introduction they will be withdrawn from the free distribution list and propagated for sale at prices to be published from time to time. These varieties will only be continued on the Division's sales list until such time as the nurserymen report having them in sufficient quantity to take care of the demand, as it is not the intention of the Horticultural Division to enter into the nursery business in a wholesale manner.

THE IMPORTANCE OF USING HARDY STOCKS FOR ROOT GRAFTING

Over a period of years a tree is no hardier than the stock on which it is grafted. Although Wealthy apple trees are considered hardy, nevertheless when grafted on tender stocks they are often lost, due to root injury. The results of the work of the Horticultural Division at Ottawa have demonstrated that, when hardy roots are used, root injury is comparatively rare. Imported stocks are liable to be grown from seed of varieties which are not sufficiently hardy for our northern climate and should not be used by northern propagators, if at all possible to obtain stocks from hardier varieties. Seed from varieties of crabs like Martha, Transcendent, Hyslop and Quaker Beauty have given stocks which have withstood severe winters at Ottawa. Likewise seed from the hardiest Russian sorts has also proven of value, such varieties as Antonovka, Anisim and Titovka being used to advantage.

In Bulletin No. 86, published by this division, attention was called to this form of winter injury and a remedy suggested in the use of hardy stocks. After citing the example of the heavy loss in trees at the Central Experimental Farm in 1895-6, due to root injury, the article says:—

> "Another reason why we have not been troubled with root-killing during the past twenty years at Ottawa is that practically all our grafted trees have been since that time grafted on crab apple roots, not on Pyrus baccata, although some are on this stock, but on the seedlings of Martha, Transcendent, and other cultivated varieties. The apple seedlings used by nurserymen for stocks vary much in hardiness. Every tree probably differs more or less and some are undoubtedly quite tender. The result is that varieties otherwise hardy, when grafted on these roots, fail, Seedlings of the crab apples are much more likely to be hardy, and we believe that if some nurseryman would make a specialty of growing the apples suitable for the colder parts of Canada on crab apple stocks, he would in time sell a large number of these trees. The advantage of crab apple roots has been very marked in the Northwestern States where trees on ordinary apple stocks have been killed out, while those on crab roots were uninjured."

It would be well if growers, in parts where root injury occurs, would heed the advice here given and demand that their trees be on crab stock, distinguishing between French crab and our hardy American sorts. The importance of this might be more fully impressed on the reader by referring to Figure on page 7 which illustrates our most recent experience in this connection as follows.

In 1920 owing to shortage of hardy roots, this division imported a quantity of root stocks grown from seed of evidently tender sorts. These were grafted during the winter of 1920-21 and planted in the spring along with a few grafts on our own stock grown from hardy crabs. During this past winter, which was a severe one for root injury, practically all, or about 95 per cent of the imported stocks were killed in the nursery rows, whereas the hardy stock showed no signs of injury. No better example than this could be found, but another case of the value of hardy root stocks might be cited. In 1915 a young orchard of McIntosh, Wealthy and Fameuse

apple trees was planted on the Division grounds. These trees were all grafted on French crab stock. During the open winter of 1919-20, which resulted in much injury to bulbs and herbaceous parennials on account of low temperatures without any protection from snow, over 75 per cent of these trees were killed at the root. When pruned in early spring, before growth commenced, the tops showed no signs of injury and were recorded as wintering well. The trees later started into full leaf and suddenly succumbed after the reserve food supply of the top had been entirely utilized. A nursery of the same varieties, growing close by, came through intact, but in this latter case they were all grafted on hardy apple or crab stock. As it is difficult for nurserymen and others to obtain stock from hardy varieties the Division is adopting the policy of turning all fruit from the hardiest crabs and Russian varieties through the cider mill for the purpose of extracting the seed, and intends to grow this seed for apple stocks to be sold direct to propagators at a reasonable price per thousand roots.

Showing relative hardiness between imported stock and stock grown from hardy crabs. X Hardy crab stock.

If all the new orchards to be planted in the districts where root injury frequently occurs can be put on hardy stocks much of the loss of the past can be eliminated. This question is one of vital importance to all who contemplate planting in the near future, and growers can do much to hasten the day of appreciation of this point by demanding that their purchases be on roots grown from varieties known to be hardy.

Not only does this apply to apple trees previously referred to, but with even greater force to plums and pears. Frequently plums are worked on Myrobolan stock and sometimes on peach stocks. Neither of these is hardy for Eastern Ontario and Quebec and should not be used. The native plum of Canada, *Prunus nigra,* or varieties of the Americana group, are hardy and may be used with success as stocks for severe districts. Pears worked on quince or tender pear roots are not to be recommended. For this fruit, growers should be assured that their varieties are on pear stocks, preferably seedlings of the Chinese pears, *Pyrus Chinensis* (Sinensis).

RESULTS FROM A THREE-YEAR SPRAYING EXPERIMENT

This test was conducted on the suggestion of the late Dr. C. Gordon Hewitt, Dominion Entomologist, for the express purpose of making a comparative study of the value of the different systems of spraying at that time recommended. The test was started in 1919 and continued during the years 1920 and 1921. The plots were four in number and were sprayed according to the following formulæ:—

Plot No.	1st Spray	2nd Spray	3rd Spray	4th Spray
1.....	Bordeaux, 3–10–40, arsenate lime, 1–40.	Bordeaux, 2–10–40, arsenate lime, 1–40.	1 lb. soluble sulphur, ½ lb. arsenate lime, 5 lb. hydrated lime, 40 gal. water.	Bordeaux, 2–10–40, arsenate lime, 1–40.
2.....	Lime sulphur, 1–20.	Lime sulphur, 1–40, arsenate lead, 1–1½ lb.	Lime sulphur, 1–40, arsenate lead, 1 lb.	
3.....	Lime sulphur, ·008, arsenate lime, ¾ lb.	Lime sulphur, ·007, arsenate lime, ¾ lb.	Lime sulphur, ·006, arsenate lime, ¾ lb.	Bordeaux, 3–10–40, arsenate lime, 1–40.
4.....	Bordeaux, 4–4–40, arsenate lime, 1–40.	Bordeaux, 4–4–40, arsenate lime, 1–40.	Bordeaux, 4–4–40, arsenate lime, 1–40.	Bordeaux, 4–4–40, arsenate lime, 1–40.

As the experiment had to be conducted in the variety test orchard, it was difficult to obtain a very large number of trees of the same variety in each plot, so that, although large numbers of trees were used for each kind of spray, the notes on apple scab, insect injury and russet injury to the fruit are taken only from a few trees of one variety, namely McIntosh. Foliage notes were taken from the plots as a whole.

The results from this three-year test, while they cannot be considered as valuable as if they had been conducted in an orchard composed of only a few sorts, do nevertheless give evidence which is of value to the orchardists in this locality at least.

Control of Scab.—During the seasons of 1920-1921 the percentage of scab from the plots did not exceed 1·5, so the range of the infestation was so slight that no comparisons of the fungicidal value of the different sprays could be made for those years. It may be said that the control was absolute in all cases. In 1919 the control of scab on McIntosh was not quite as good as in the two succeeding years. In this year plot No. 1 gave 15 per cent scabby fruit, while plot No. 2 (the lime sulphur plot) gave 8 per cent scab, and plots 3 and 4 gave no scab and 9 per cent scab respectively. Any difference that there was, was decidedly in favour of lime sulphur as a fungicide, although the control on all plots was highly satisfactory.

Injury from Russeting.—One of the essential objects in this test was to determine whether or not the 3–10–40 formula with the third spray of soluble sulphur would eliminate the russeting of the fruit. Russeting was noticeable only during 1919; in the two subsequent years little or no russeting occurred in any of the plots. In 1919, however, plot No. 1 showed 31 per cent russeted fruit, plot No. 2, 7 per cent, plot No. 3, 9 per cent, and plot No. 4, 54 per cent. In other words, the 4–4–40 Bordeaux plot gave the highest percentage of russeted fruit, with the 3–10–40 plot a fairly close second, while the two lime sulphur plots had only seven and nine per cent of the fruit russeted.

Although such a condition only occurred once in three years, being apparently due to seasonal changes, nevertheless, with the new Fruit Marks Act excluding russeted fruit from the higher grade of extra fancy, this question is bound to be of more importance than formerly. Although the amount of russeting could be arrived at on a mathematical basis only once during the test, our notes show that in every season the actual finish of the fruit from the lime sulphur plots was decidedly superior to the finish of the fruit from the trees sprayed with Bordeaux mixture.

Set of Bloom Under both Lime Sulphur and Bordeaux.—To determine the effect of the two sprays upon the set of fruit, a count of bloom on each plot was made prior to the fall of the petals and a count of the actual set of fruit from these same blossoms was made three weeks later. The results of this count showed an average set of 17·7 per cent on the two Bordeaux plots and 17·4 per cent on the two lime sulphur plots. These results would not indicate any difference between the two sprays in influencing the set under our conditions. That the use of lime sulphur does not result in a reduction of the actual set of fruit in Eastern Ontario and Quebec would appear to be the case, as other experiments conducted in this part of the country go to indicate.

Foliage Injury.—In none of the plots was there any injury that could be attributed to spray. At different seasons some yellow leaf would occur, and in one or two instances a casual examination appeared to indicate that this was slightly worse on the Bordeaux plot, but closer observation was unable to disclose any appreciable difference. In addition, it was noted that, within a very short time, trees which had shown considerable yellow leaf were indistinguishable from the others and that, furthermore, these trees showing yellow leaf were, in the majority of cases, the most vigorous and heaviest carriers of foliage in the orchard. This has led to the conclusion that yellow leaf is more or less a natural function of the tree to get rid of excess foliage and that probably the reason it is more noticeable sometimes in sprayed orchards is because the foliage of the tree is so extremely healthy and vigorous that an excess of leaf area is soon established, with a resultant drop of a small percentage of yellow leaves, followed by a period when these trees are indistinguishable from trees which never showed this apparent malady. The same condition is sometimes noticeable in early summer when the nitrate content of the soil is low.

Conclusion.—The three-year test has led to the conclusion that lime sulphur, when used according to the formula in plot No. 3, is fully as good a fungicide as Bordeaux mixture; that it will put a better finish on the fruit and causes less russeting, and is therefore to be recommended for this district as the superior spray.

INDIVIDUALITY IN APPLE TREES

In the Interim Report of this Division, published in 1921, the results to date of the bud heredity experiment, started in 1896, were recorded. Since then data on girth measurement, observations on uniformity of trees and death records, together with results from top-grafts of the same parentage, have been accumulated and are here recorded. As we continually have trees dying, due to winter injury and other causes, there are fewer trees to report upon this season than last, consequently the report, in so far as yields are concerned, will not in a few years' time bear any significance, owing to the reduced number of individuals.

As will be seen by examining the following data, the largest percentage of deaths has been among the low yielding progeny, which also, according to girth measurement, are the least vigorous of all the trees, so that lack of productiveness in this instance is coupled with lack of vigour. The most striking feature of the experiment is the uniform vigour of the rows propagated from the heaviest yielding individual and from the heaviest and most regular bearing tree. The progeny from the highest yielder is more vigorous than that from the heaviest and most regular bearer, and both are decidedly superior in vigour to the progeny of the poorest yielding individual. Over 45 per cent of the trees propagated from the poorest yielding tree have succumbed, while the trees from the heaviest yielding parent, growing in the next row to these, have only had a little over 23 per cent of their number die. The progeny of the heaviest and most regular bearer have had only 17 per cent die.

Growing in the same orchard as these trees is a large number of Wealthy trees planted a year earlier and received from a nurseryman. Presumably these trees were propagated from scions taken from different trees. Upon comparing the uniformity of this block with that of the experiment, a striking difference is noticeable. Briefly summarizing, the differences appear as follows:—

(1) Trees propagated from heaviest yielding parent are uniformly vigorous and have only had 23 per cent deaths.

(2) Trees propagated from heaviest and most regular bearer are uniform in vigour, but do not show as large girths as trees in No. 1. Deaths only amount to 17 per cent.

(3) Trees propagated from poorest yielding parent are uniformly lacking in vigour and have had over 45 per cent of trees die.

(4) Trees of Wealthy obtained from commercial nurseryman lack in uniformity, many being vigorous and many lacking in vigour. Deaths amount to 26·47 per cent.

YIELD OF PROGENY FROM HEAVIEST YIELDING TREE IN WEALTHY ORCHARD. PARENT No. 4-4.

Tree	Grand total of each for nine years up to end of 1920	Grand total of each for ten years up to end of 1921	Circumference in inches
	gallons	gallons	
3-1	41·75	62·75	14·50
3-2	66·75	92·75	16·75
3-3	62·0	80·0	14·0
3-4	61·25	96·25	17·50
3-5	66·50	97·50	14·75
3-6	77·25	106·25	16·75
3-7	30·25	57·25	14·75
3-8	63·25	103·25	17·75
3-9	56·75	88·75	16·75
3-10	70·0	99·50	15·75
3-12	68·0	103·0	16·75
3-14	54·5	80·50	15·0
3-16	46·75	72·75	17·50
4-12	72·75 (dead 1920)	.....	16·50
4-13	34·50	60·50	14·25
4-15	62·0	99·0	16·0
2-17	37·75	57·75	15·25
17	972·	1,257·75	

Average total yield per tree for nine years ..... 57·18 gallons
Range from 30·25 to 77·25 gallons.

Average total yield per tree for ten years ..... 78·61 gallons
Range from 57·25 to 106·25 gallons.

YIELD OF PROGENY FROM HEAVIEST AND MOST REGULAR BEARING TREE IN WEALTHY ORCHARD. PARENT NO. 4–5.

Tree	Grand total of each for nine years up to end of 1920	Grand total of each for ten years up to end of 1921	Circumference in inches
	gallons	gallons	
5–1	39·50	55·50	13·0
5–2	41·25	60·25	14·75
5–3	23·25	29·75	11·0
5–4	23·50	36·50	14·75
5–5	52·75	66·75	15·50
5–6	66·50	67·0	17·0
5–7	31·25	46·75	13·50
5–8	45·50	75·50	16·0
5–9	54·0	96·00	16·25
5–10	62·25	101·25	16·0
5–11	75·0	97·00	16·0
5–12	65·75 (bad condition)	.....	13·50
12	580·50	732·25	

Average total yield per tree for nine years..... 48·375 gallons
Range from 23·25 gallons to 75·25 gallons.

Average total yield per tree for ten years..... 61·05 gallons
Range from 36·50 to 101·25 gallons.

YIELD OF PROGENY FROM POOREST YIELDING TREE IN WEALTHY ORCHARD. PARENT NO. 4–2.

Tree	Grand total of each for nine years up to end of 1920	Grand total of each for ten years up to end of 1921	Circumference in inches
	gallons	gallons	
4–1	31·50	51·50	13·5
4–2	49·0	78·50	14·0
4–3	42·0 (died 1920)	.....	14·0
4–5	42·0 (nearly dead)	.....	15·0
4–6	24·0 (nearly dead)	.....	12·0
4–8	25·0	37·0	13·0
4–10	41·0 (bad condition)		
4–11	27·50	44·50	13·25
8	282	211·50	

Average total yield per tree for nine years..... 35·22 gallons
Range from 24 gallons to 49 gallons.

Average yield per tree for ten years..... 52·9 gallons
Range from 37 to 78·5 gallons.

These results to date show positively as great difference in yield in favour of the high yielding progeny as did the results to the end of 1920.

As a more or less efficient check on the foregoing experiment, scions from the three parent trees mentioned were top-grafted on large, bearing trees in the Russian orchard. Five trees were used for this purpose and on each tree scions from all three parents were grafted, the position of each lot being changed on each tree so that on

one tree the poorest yielding scions would he on the north side, while on the next tree they would have a southern exposure, etc. The limbs selected for grafting were as uniform as possible. The results from this check follow:—

YIELDS FOR FIVE-YEAR PERIOD, 1911 TO 1915, INCLUSIVE.

Tree No.	Poorest yielding Progeny	Largest and most regular yielding Progeny	Largest yielding Progeny
	gallons	gallons	gallons
36–21	10·75	32·0	25·25
44–13	15·0	15·75	19·50
43–27	3·0	30·50	12·50
42–25	0·25	6·0	5·0
45–7	7·50	12·0	16·50
Totals	36·50	96·25	78·75

It has only heen possible to use the results for the first five year period, as, since that date, pilfering and accidents have rendered the records from these trees unreliable. It will he noted, however, that here again there is a distinct difference in favour of the two high yielding progenies, although the progeny from the largest and most regular hearer has given a larger yield than that from the heaviest yielder. Nevertheless there is a distinct lack of productiveness of the progeny from the poorest yielding parent.

THE MANUFACTURE OF SWEET APPLE CIDER

Considerahlc attention has heen paid during the last two years to the manufacture of pure apple cider. The data at hand do not at all cover the whole situation and are not presented as a complete experiment on the manufacture of apple cider, but are simply published for the information of those persons interested in its manufacture.

The turning of a large portion of otherwise waste apples into cider should he a profitable undertaking, if the article could be sold as a pure fruit juice with fermentation arrested by means other than the use of chemical preservatives. This, as will be shown later, is quite easy to accomplish, so that there is no reason why genuine sweet cider or pure apple juice should not find its way on the market.

In all the work here described, a small hand cider mill was used, and only clean, wholesome fruit was selected. Decayed or decaying specimens were rejected, hut clean windfalls, hruised and scabby fruit and small and poorly-coloured specimens were accepted. After running the apples through the grinder or pulper, the pulped mass was pressed by hand and the extracted juice run through a filter of several thicknesses of clean sacking and thin factory cotton, to take out all seeds and pulpy matter. The filtered liquid appeared reasonably clear and was then stored in harrels for a few days until fermentation had commenced. The cider was then run into bottles and capped by a hand capping machine and immediately pasteurized to arrest fermentation.

AMOUNT OF CIDER DERIVED FROM DIFFERENT VARIETIES OF APPLES

Variety	Quantity of Fruit	Amount of Juice	Percentage of Juice	Saccharometer Test
		Gal.		
Wealthy	192 lb.	8·75	45·5	10·75
Patten Duchess	197 "	10·0	50·0	12·00
Hibernal	192 "	8·50	44·2	12·00
Antonovka	204 "	8·0	39·0	10·50
Patten Greening	190 "	9·75	50·1	12·75
Amtman	145 "	5·50	30·7	11·00
Quaker Beauty	5 bush.	6·00	25·0 (approx.)	17·00

The foregoing table gives the quantity of fruit juice expressed from certain amounts of apples of different varieties. It will be noted that there is considerable difference between the different sorts as to the quantity of juice they yield. In the right hand column is given the saccharometer test of the different juices, which is a rough estimate of the sugar content of the different juices. Quaker Beauty with 17 per cent sugar was outstanding in this respect and produced a delicious, white, sparkling, sweet cider, by far the best furnished by any variety experimented with.

There was considerable variation in the colour of the different fruit juices, varying from pale to rich amber, and, in the case of Quaker Beauty, to pure white. The colour notes of the varieties referred to above are given below:—

Wealthy, rich, clear amber.
Patten Duchess, rich, clear amber.
Hibernal, pale amber.
Antonovka, dull, pale, heavy looking.
Patten Greening, rich, clear amber.
Amtman. rich, clear amber.
Quaker Beauty, pure white, clear.

Pasteurization.—After considerable experimentation it was found that it was possible completely to arrest fermentation at any stage without imparting a cooked flavour to the product or in any way imparing its value. Extreme care, however, is necessary in this respect. It was found that the temperature must be kept at from 135° to 140°F. If permitted to go above 140° a cooked flavour is imparted and if below 135° pasteurization is not complete. The length of time required was found to be two hours and the method as follows:

After capping the bottles (having filled them to within one inch of the top) place them in a boiler of warm water and heat up to 135°F. Keep at this temperature for two hours, taking care that at no time does the temperature rise beyond 140°F. At the end of the two-hour period the bottles may be removed and kept indefinitely without fear of fermentation proceeding. Some sediment may be noticed in the bottles after a few weeks or even days, but this is merely the precipitation of the portion of the fruit juices and should be shaken up with the rest of the liquid before drinking.

STRAWBERRY CULTURE—EARLY PLANTING AN ESSENTIAL FEATURE OF SUCCESS

An interesting experiment which proved to be replete with valuable information was commenced in 1919, to ascertain the possibility of a correlation between the date of stolon or runner formation and yield. Another phase of this experiment is designed to throw light on the possibility of there being any advantage in using the oldest-formed stolons or runners for transplanting purposes.

It has long been recommended that strawberry plantations should be set out in early spring, but unfortunately there has also spread abroad the idea that early August planting is also to be recommended. A careful study of the results reported herewith should dispel any such idea, for, although it may be possible by planting late to obtain as large a stand of plants as by planting early, the yield the following year cannot help but be much lower than the yield from a similar stand of plants in a bed where the originals were planted early in the season. This point will be brought out more clearly in the following analysis of the experiment.

OUTLINE OF THE EXPERIMENT

In 1919 a number of individual strawberry plants of the variety Parson Beauty were set out at a distance of five feet apart in rows six feet apart. The runners or stolons from each parent plant were kept separate and a record was taken as to the

position of each stolon and the date when it first rooted. This was accomplished by staking each stolon as soon as it formed, giving it a serial number and dating it. In this way, at the end of 1919, there was on hand a large number of individual strawberry plants, of which the following was definitely known: (1) date of formation or rooting; (2) parent; (3) position or location with regard to the parent. For example, parent No. 56 put out a runner which rooted on the 14th of July. This plant was given the number 56/1 and the date of its formation, namely 14–7, appended to the label. The 56 is the number of the original plant and the 1 signifies that it was the first stolon put out by the original parent. 56/1 later on put out a stolon which was designated as 56/11, and 56 itself put out another stolon which received the number 56/2, and so on.

The test was divided into two sections. In one instance all these young plants with known dates of formation and pedigree were lifted and transplanted. In the other instance they were permitted to continue growth in their original location and allowed to fruit, a record being kept of the number of fruits produced by each individual stolon in the matted row.

RESULTS

Dealing first with that part of the experiment where the stolons were permitted to remain in their original position, it was found that there was decided correlation between the date the stolon rooted and the ultimate number of fruits it produced. Stolons formed as late as the 20th of October produced, on the average, only five fruits, whereas stolons formed about the middle of August produced an average of sixteen fruits. This is portrayed graphically in figure No. 1. Runners formed much

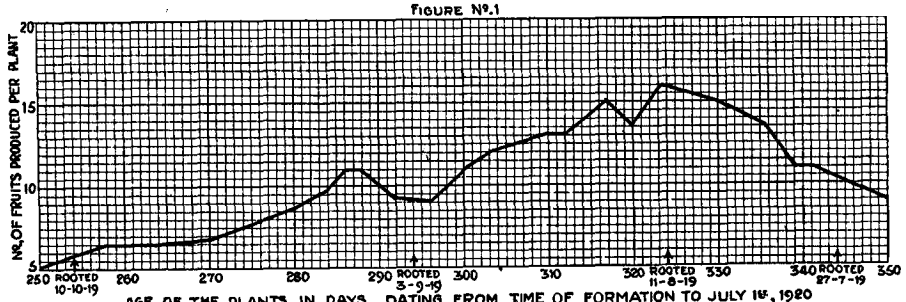


FIGURE Nº.1, SHOWING RELATION BETWEEN YIELD AND AGE OF THE STOLON.

earlier than this produced about nine to ten fruits. Apparently the reason for the falling off of these extremely early formed stolons is due to the fact that these are the parents of large numbers of stolons and, like the original parents, became depleted of energy. The number of these early, poor yielders is comparatively small, as will be seen by examining table No. 2, which shows the percentage of stolons formed on the different dates. From an examination of this table and the graph in figure No. 1, it is evident that the most profitable period of stolon formation lies between the later part of July and the last of September. Although over one-third of the stolons were formed in October they produced only 19·6 per cent of the crop, which, when compared with 34 per cent of the crop produced by 25 per cent of the stolons which were formed in August, demonstrates the great value of early planting and good care in the early part of the season.

This same point is presented in a little different form in figure No. 3, which is a graph showing a relation of yield between what is here termed the different generations of stolons. That is to say, the plant's first set from the original mother plants we considered as first generation, those set from them in turn are termed second generation, etc.

The range in yield is here a little different to that in figure No. 1, because there is, of course, some over-lapping. That is, all the first generation plants are not necessarily the first rooted. The following plan will make this a little clearer:—

PARENT No. 2

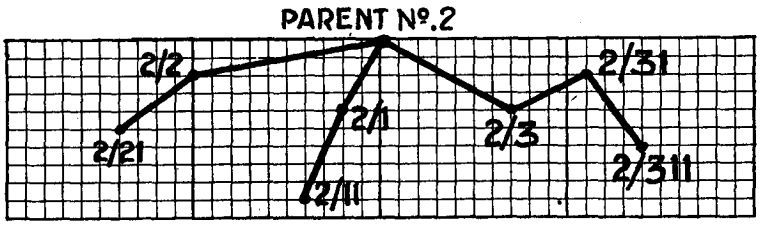
Stolons 2/1, 2/2, 2/3 are first generation plants.
Stolons 2/11, 2/21 and 2/31 are second generation plants.
Stolon 2/311 is a third generation plant.

But stolon 2/1 rooted July 22 and stolon 2/2 not until August 15, while stolon 2/11 rooted August 4.

Figure No. 3 demonstrates quite clearly, however, that there is on the whole a close correlation between the generation and the yield.

Summary of Part 1 of the Experiment

Briefly then it has been shown (1) that the stolons formed in the early part of the season are the ones which give the largest number of flower stalks and hence the largest yield of fruit, (2) that, although the stolons produced directly by the original parent (here termed first generation plants) are not in all cases the earliest formed or rooted, they give larger returns than the stolons produced by themselves, etc., or in other words, that there is also correlation between yield and generation.



The practical value of this is apparent and is an object lesson that early planting and extra care during the early part of the season is of the utmost value in economic strawberry production. Growers should pay particular attention to and appreciate this point wherever the matted row is used. Two plantations having in November an apparently equal stand of plants, may give enormously different results in yield the following year, if one has a large stand of early-rooted plants, and the other a stand composed largely of late-formed stolons. If a practically full stand can be obtained by the first of September, or the middle of September, it would be better from that date to keep the late-formed plants cut off, in order to give the earlier formed ones every opportunity to develop crowns for the succeeding year. Late planting should be avoided where possible, as it is almost certain to result in low yields of fruit, although giving a full stand of plants.

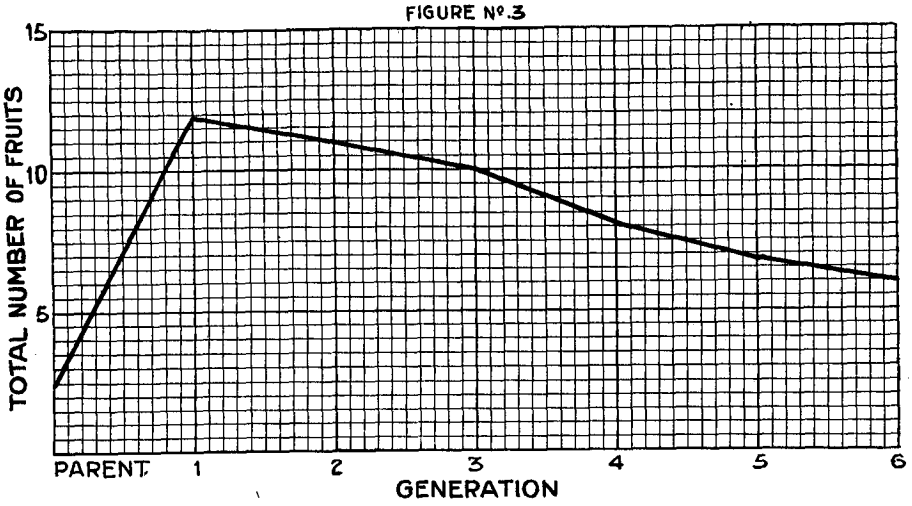
Part 2 of the Experiment

In this phase the pedigree plants were lifted and transplanted and grown in the hill system to determine whether or not there would be an advantage in selecting the largest and best formed stolons, generally found in the centre of the row, in preference to the later formed or smaller ones located on the outer edges of the mat.

Owing to the extremely dry season of 1921, this experiment has not been fruitful of results. The heaviest yielding plants, or those plants which bid fair to be the heavy producers, were naturally more affected by the drought than those carrying

a small load of berries, consequently the results were hardly comparable. This test has, therefore, been continued and is now being run on two different lines, (1) where the plants are grown as individuals on the hill system, and (2) where they are permitted to form matted rows. The only results to date have demonstrated that the very late formed stolons were not able to get away to as early a start as

FIGURE Nº.3



Showing relation between generation and yield

those of larger size, but whether or not there would be an actual advantage in selecting July and August formed plants in preference to September formed ones has yet to be determined. One is led to suspect that there would be an advantage in so doing, but it is hoped that definite information on this point will be gained in the course of the next two years' work along this line.

TABLE NO. 2, SHOWING THE PERCENTAGE OF STOLONS FORMED ON DIFFERENT DATES

Date	Percentage Formed	
July 7	0.37	6.76% formed during month of July produced 6.5% of the fruit
" 14	1.11	
" 16	0.61	
" 18	0.74	
" 21	0.25	
" 23	1.23	
" 25	0.61	
" 26	0.12	
" 28	1.11	
" 30	0.61	
Aug. 2	0.98	25.10% formed during month of August produced 34% of the fruit.
" 6	1.11	
" 8	0.25	
" 11	2.21	
" 14	1.11	
" 18	3.08	
" 22	16.36	
Sept. 3	7.13	31.36% formed during month of September produced 39% of the fruit.
" 8	0.49	
" 18	16.61	
" 19	0.12	
" 20	7.01	
Oct. 10	27.43	39.22% formed during month of October produced 19.6% of the fruit.
After Oct. 10	11.79	

VEGETABLES

The work with vegetables consists mainly in the comparison of cultural methods, the test of varieties, the growing of vegetable seed crops, and the origination of new varieties by cross-breeding and selection. The forcing of vegetables is also carried on in the greenhouses, and information is being obtained which it is believed is of value to vegetable growers.

Following are the results obtained from certain experiments with some of the kinds of vegetables under test in 1921:—

ASPARAGUS

The asparagus crop being an important one, it deserves some attention, because, being an early vegetable, it sells well and yields very good returns. This is a comparatively easy crop to grow, the soil requirements being quite similar to those of other garden crops, requiring to be grown rapidly. A soil that is a sandy loam in texture and rich in plant food, is no doubt the best type of soil for the asparagus bed. Moderately deep planting is desirable, so as to have the crowns six inches below the surface of the ground. The rows should be four feet apart and the plants set a distance of eighteen inches apart in the row. Fall planting is the most suitable, which may be done any time during the month of September.

Ten varieties have been under test for a period of five years, and from these, have been picked out two varieties to illustrate the features of this crop. As will be noticed, the results have been obtained from plantations in which the plants were set at distances ranging from twelve inches to thirty-six inches apart in rows 4 feet apart. From the time of planting out until the first crop is obtained is usually three years. When the plants begin to yield a crop, care should be taken to avoid late harvesting or removing crops too late in the season. Late cutting usually does damage to the plants, reducing the yield the following year.

In the table to follow will be found information relative to this sort of vegetable, and at this juncture it should be mentioned that the plants in all cases, in these beds, were set out during the month of September, 1915:—

ASPARAGUS—RESULTS OF TEST

Record No.	Variety	Inches apart in row	Year	Number of Plants	Date ready for use	Date First Cutting	Date Last Cutting	Number of Cuttings	Number bunches Marketable	Weight of Marketable Lb.	Oz.
0-38	Conover Colossal	12	1917	38	22-V	22-V	25-V	22	10	5	6
	" "	12	1918	38	16-V	20-V	29-VI	21	11	6	2
	" "	12	1919	38	26-V	27-V	18-VI	12	11	6	4
	" "	12	1920	38	13-V	13-V	21-VI	18	24	12	1
	" "	12	1921	38	3-V	5-V	17-VI	22	20	10	3
0-35	Columbian Mammoth White	12	1917	38	17-V	19-V	25-VI	25	15	7	15
	" "	12	1918	38	15-V	18-V	29-VI	22	25	13	4
	" "	12	1919	38	19-V	22-V	18-VI	14	21	10	8
	" "	12	1920	38	13-V	13-V	21-VI	19	29	12	11
	" "	12	1921	38	4-V	5-V	25-VI	22	19	9	8
0-49	Conover Colossal	18	1917	26	22-V	22-V	25-VI	22	5	2	11
	" "	18	1918	26	16-V	25-V	29-VI	20	3	6	9
	" "	18	1919	26	25-V	27-V	18-VI	21	10	4	15
	" "	18	1920	26	13-V	13-V	21-VI	19	19	9	5
	" "	18	1921	26	5-V	5-V	17-VI	22	16	7	14
0-46	Columbian Mammoth White	18	1917	26	17-V	19-V	25-VI	25	15	7	7
	" "	18	1918	26	14-V	18-V	29-VI	22	23	11	9
	" "	18	1919	26	21-V	23-V	18-VI	21	25	12	5
	" "	18	1920	26	13-V	13-V	21-VI	19	34	17	
	" "	18	1921	26	3-V	5-V	17-VI	22	28	14	1
0-60	Conover Colossal	24	1917	19	24-V	26-V	25-VI	22	7	3	15
	" "	24	1918	19	15-V	20-V	29-VI	20	14	6	14
	" "	24	1919	19	25-V	27-V	18-VI	21	13	6	9
	" "	24	1920	19	13-V	13-V	21-VI	19	29	14	10
	" "	24	1921	19	3-V	5-V	17-VI	21	14	7	1
0-57	Columbian Mammoth White	24	1917	19	15-V	19-V	20-VI	24	15	7	11
	" "	24	1918	19	15-V	18-V	29-VI	22	22	11	4
	" "	24	1919	19	19-V	22-V	18-VI	14	22	11	1
	" "	24	1920	19	13-V	13-V	21-VI	19	32	16	
	" "	24	1921	19	3-V	5-V	17-VI	22	27	13	10
0-71	Conover Colossal	36	1917	13	22-V	22-V	26-VI	12	6	3	0
	" "	36	1918	13	16-V	20-V	29-VI	21	11	5	11
	" "	36	1919	13	25-V	27-V	18-VI	13	11	5	9
	" "	36	1920	13	19-V	19-V	21-VI	17	13	6	9
	" "	36	1921	13	3-V	5-V	17-VI	22	13	6	12
0-68	Columbian Mammoth White	36	1917	13	18-V	19-V	25-VI	22	10	4	13
	" "	36	1918	13	15-V	18-V	29-VI	22	19	9	8
	" "	36	1919	13	23-V	27-V	18-VI	13	19	9	5
	" "	36	1920	13	13-V	13-V	21-VI	19	16	7	14
	" "	36	1921	13	3-V	5-V	17-VI	22	19	9	8

POLE BEANS

During the past season, twenty-eight varieties of pole beans were tested, and while several proved quite desirable, yet it is considered that there is room for material improvement with regard to the general qualities of many of these sorts. In fact some selection work has been started and will be continued. The results obtained from the two years' work carried on have been encouraging and should be productive of improvement on the original varieties. There is every reason to believe that the pole bean will gain in favour once the quality of the crop is improved. Some of the things aimed at are earliness, yield, quality and disease resistance.

In the following table will be found the results obtained in the one year test with the various sorts:—

POLE BEANS—RESULTS OF ONE-YEAR TESTS

Variety	Colour of Pods	Date of Planting	Number of Vines	Date of Harvesting	Yield of Ripened Seed		Yield of Ripened Seed from 25 vines	
					Lb.	Oz.	Lb.	Oz.
Barnett Pole	Light green	30-V	2	4-X		8	6	4
Earliest of All	Green	"	74	4-X	9	8	3	3
Phenomenal White Haricot	Dark green	"	73	13-IX	8	12	3	0
Scotia	"	"	115	22-IX	9	0	2	0
Noxall	Light green	"	100	1-X	7	12	1	15
0-1666 No. 1	Green	"	92	13-IX	7	0	1	14
Climbing French	Light green	"	61	4-X	4	8	1	13
Princess of Wales		"	83	4-X	6	0	1	12
0-1680 No. 3		"	143	28-IX	9	0	1	9
Hollandaise	Light green	"	121	13-IX	7	12	1	9
0-1667 No. 2	Green	"	95	4-X	4	0	1	8
Kentucky Wonder	Yellow	"	120	13-IX	6	12	1	6
Kentucky Wonder	"	"	46	13-IX	2	7	1	5
James 0-1672	Dark green	"	81	13-IX	4	1	1	4
McCoslan	"	"	144	13-IX	6	12	1	3
0-1690 Round Pod Kidney Wax	Light green	"	87	8-X	3	10	1	2
Canadian Asparagus	"	"	101	22-IX	3	4		13
Tender and True	"	"	89	4-X	2	8		11
Canadian Wonder	Green	"	32	4-X		14		11
Prize Winner	Dark green	"	40	4-X	1	0		10
0-1675 P.S.P.	Green	"	23	4-X		8		9
Mammoth White		"	67	4-X	1	2		7
The Marvel	Dark green	"	38	4-X		10		6
King of the Garden	"	"	78	8-X	1	4		6
Nonsuch Runner	"	"	77	8-X		12		4
Titan Runner	"	"	31	4-X		4		3
Scarlet Runner	"	"	102	8-X		12		3
White Czar	"	"	54	4-X		5		2

Nine varieties or strains of pole beans have been tested for two years, and it is remarkable the variation found in them. Some of the varieties or strains have shown a tendency towards a decrease in yield when grown the second year, while others under the same selection work have shown quite outstanding improvement.

POLE BEANS—TWO-YEAR TESTS

Record No.	Variety	Year Origin	Date of Planting	Colour of Pods	Date Ready for use	Date of Ripening	Yield per 50-ft. row Ripened Seed Lb.	Oz.
0-549	No. 3 Stringless Green Pod	1920 Com...	27-V	Dark green...	1 Vine	10-IX		4
0-1680	No. 3 Stringless Green Pod	1921 0-549...	30-V	" ...	12-VIII	18-IX	13	3
0-601	Hollandaise	1920 Com...	28-V	Dark green...	5-VIII	25-VIII	4	10
0-1684	"	1921 0-601...	30-V	" ...	5-VIII	7-IX	11	6
0-575	No. 1 Round Pod Kidney	1920 0-9991B	27-V	Green	26-VII	2-IX	4	15
0-1666	No. 1 Round Pod Kidney	1921 0-575...	30-V	"	28-VII	9-IX	10	3
0-885	White Bean	1920 Special.	7-VI	Dark green...	25-VIII	15-IX	7	8
0-1672	"	1921 0-885...	30-V	" ...	20-VIII	8-IX	5	15
0-577	No. 2 Round Pod Kidney	1920 0-9762..	27-V	Green	15-VIII	11-IX	4	8
0-1667	No. 2 Round Pod Kidney	1921 0-577...	30-V	"	15-VIII	12-IX	5	14
0-550	Round Pod Kidney...	1920 Com...	27-V	Light green...	1 Vine	23-VIII		4
0-1690	" " ...	1921 0-550...	30-V	" ...	.....	20-IX	5	5
0-600	Canadian Asparagus...	1920 Com...	28-V	Light green...	10-VIII	9-IX	3	1
0-1685	" " ...	1921 0-600...	30-V	" ...	12-VIII	15-IX	4	12
0-9809	No. 47 White	1919 Com...	9-VI	Dark green...	.....	21-IX..	1	9
0-621	No. 47 "	1920 0-9809..	28-V	" ...	10-VIII	12-IX	1	7
0-612	Scarlet Runner	1920 Com...	28-V	Dark green...	27-VIII	8-IX	4	8
0-1681	" "	1921 0-612...	30-V	" ...	28-VIII	25-IX	1	1

In the following table will be found the results of three years' selection work with two varieties of pole beans, and in both cases very remarkable improvement has been brought about in the way of increased yields. This was accomplished by continued selection of the most productive plants:—

POLE BEANS—THREE-YEAR TESTS

Record No.	Variety	Year	Origin of Seed	Date of Planting	Colour of Pods	Date Ready for use	Date of Ripening	Yield per 50-ft. row. Ripened Seed Lb.	Oz.
0-9808	No. 46 Noxall	1919	Com...	9-VI	Dark green...	20-VIII	21-IX	4	14
0-620	No. 46 "	1920	0-9808..	28-V	" ...	5-VIII	1-IX	2	3
0-1686	No. 46 "	1921	0-620..	30-V	" ...	6-VIII	25-IX	11	6
0-9816	No. 41 McCoslan	1919	Com..	9-VI	" ...	15-VIII	22-IX	1	12
0-619	No. 41 "	1920	0-9816..	28-V	" ...	5-VIII	1-IX	2	12
0-1691	No. 41 "	1921	0-619...	30-V	" ...	5-VIII	8-IX	9	14

CORN

The early varieties of sweet corn originated in the Horticultural Division and introduced some years ago continue to prove very popular, particularly in those parts of Canada where the warm season is relatively short. Both the Early Malcolm and the Sweet Squaw are very useful for the prairie provinces, but the Pickaninny, described in the Annual Report for last year, because of its extreme earliness and good quality is in great demand. This is a cross made at Ottawa in 1918 between a dwarf black corn obtained from Thos. A. Peters, Hampton, N.B., in 1916, and the Sweet Squaw.

The following interesting history of the origin of the dwarf black corn obtained from Mr. Peters is given in a letter received from Miss L. Annie Veazey, St. Stephen, N.B.:—

OLD OAKS, ST. STEPHEN, N.B., May 11, 1922.

Mr. W. T. MACOUN,

DEAR SIR,—Mr. Slayton, a proprietor of an iron foundry in Calais, Me., (opposite St. Stephen, N.B., the two places being like one community), originated this corn from Black Mexican crossed with something dwarf (it is not known by any one whom I can find just what the dwarf corn was). The seed has been passed about among a few families who are interested in gardening for at least forty years. It is from two to three weeks earlier than any variety which we can ever obtain from the rural seed stores or dealers. This is a hard climate in which to raise corn. You have tested it and you know its wonderful flavour and how the kernels separate from the cob. Many people from the corn regions who have eaten it in my house have told me that they had tasted nothing to equal it. One of its chief characteristics here, owing to its being so long acclimated, is its hardiness in the spring—its endurance of late frosts.

Most cordially,

(Sgd.) L. ANNIE VEAZEY.

VARIETY TEST OF CORN

In connection with this test, thirty-five varieties and strains were compared. This comparison was for the purpose of finding the sorts possessing earliness, yield and good quality, and, from the results obtained, it is quite evident that there is a very great degree of variability quite noticeable within certain varieties procured from different sources.

As will be noticed in the table to follow, some of the varieties were very early and gave fairly satisfactory yields, features quite sufficient to recommend these sorts for regions where extreme earliness is desired. However, the quality of Golden Bantam has not been equalled by any other variety tested so far.

In connection with the Central Experimental Farm strains, such as Early Malcolm, Sweet Squaw and Pickaninny, there is every reason to believe that these new sorts will come more into favour in the near future, because, as will be noticed, these varieties all are among the earliest, and may be considered as possessing quality in sufficient degree to recommend them for quite general growing. Although Pickaninny, has not reached a degree of perfection so that it can really be considered of commercial value, as in the case of the former two sorts, yet with continued selection, very shortly Pickaninny will be especially valuable. Even at the present time there is quite a large demand for this corn by people living in regions where the season for corn is extremely short.

TABLE CORN—GROWN IN HILLS THREE BY THREE FEET APART

Record No.	Variety	Origin	Planted	No. of Stalks	Ready for use	No. of Ears	Average per stalk
1422	Early July	Com.	19–V	58	23–VII	146	2·51
1432	Early Corn No. 1	Special	"	56	22–VII	131	2·34
1398	Malakoff	Com.	"	38	23–VII	75	1·97
1406	Black Mexican	"	"	46	14–VIII	81	1·76
1421	Early June	"	"	48	22–VII	84	1·75
1405	Sweet Squaw	O–622–26	"	53	23–VII	89	1·68
1402	Assiniboine	Com.	"	50	18–VII	82	1·64
1425	Nuetta Sweet	"	"	58	22–VII	95	1·63
1433	Early Corn No. 2	Special	"	47	18–VII	72	1·53
1424	Pickaninny A	O–871–76	"	57	18–VII	83	1·43
1434	Yellow Corn	Special	"	58	19–VII	80	1·38
1396	Stowell Evergreen	Com.	"	50	15–VIII	67	1·34
1413	Yellow Corn	Special	"	49	18–VII	65	1·32
1426	Indian Sweet	Com.	"	58	23–VII	77	1·32
1397	Early Malcolm	846–58	"	45	23–VII	59	1·31
1429	Metropolitan	Com.	"	51	1–VIII	66	1·29
1399	Early Malcolm No. 3	Lennoxville	"	43	23–VII	55	1·28
1435	Pickaninny 54–20	O–876	"	49	18–VII	62	1·26
1400	Improved Early Dakota	Com.	"	44	23–VII	55	1·25
1411	Golden Bantam	Special	"	60	27–VII	75	1·25
1420	Early Mayflower	Com.	"	52	23–VII	65	1·25
1404	Sweet Otta	O–886–9	"	52	23–VII	64	1·23
1412	Early Dixon	Special	"	54	21–VII	66	1·22
1418	Extra Early Cory	Com.	"	58	26–VII	69	1·19
1403	Sweet Kloochman	O–896	"	53	21–VII	63	1·19
1419	Early Fordhook	Com.	"	51	26–VII	58	1·13
1401	Whipple Early	"	"	51	27–VII	57	1·11
1414	McLaren Flint	Special	"	53	22–VII	59	1·11
1423	Extra Early Adams	Com.	"	44	24–VII	47	1·07
1417	Country Gentleman	"	"	55	16–VIII	58	1·05
1407	Evergreen Bantam	"	"	53	14–VIII	54	1·01
1410	Golden Bantam	"	"	58	27–VII	56	0·96
1408	Golden Giant	"	"	18	14–VIII	16	0·90
1427	Golden Rod	"	"	49	1–VIII	42	0·85
1428	Pocahontas	"	"	53	1–VIII	37	0·70

CUCUMBER EXPERIMENT IN GREENHOUSE, 1921

The cucumber is one of the most profitable greenhouse crops, hence it is important that experiments be conducted in order to learn which varieties are most suited to greenhouse conditions, and to obtain, if possible, other and better varieties by breeding. In 1921, an experiment was made with the varieties Davis Perfect, Rennie XXX, Vaughan, Deltus, and two strains of Hescrow, all claimed to be good forcing varieties, the last-named being developed at the Experimental Station, Vineland, Ont., and having the great merit of setting fruit freely without artificial pollination. In the following experiment, therefore, all varieties except Hescrow were cross-pollinated by hand, the Hescrow being left unfertilized, and, as there were no bees in the house nor other insects to pollinate the flowers, the fruit set on the Hescrow was unfertilized and seedless. Besides the objects of comparing varieties specially recommended for forcing, and those pollinated with those without pollination, there was a third object, namely, to learn the yield from a house of cucumbers grown commercially and the cost and profit as far as could be reckoned.

How the Experiment was Conducted.—The vegetable house was used for this experiment. The soil was rotted sod and manure. The temperature was 80° in the daytime and 65° at night.

The varieties were:— Hescrow 61-8-15. Hescrow 86-1-1. Rennie XXX. Davis Perfect. Vaughan. Deltus.

Date of sowing seed, February 23, 1921.

Planted in vegetable house, March 26, 1921.

In the bed the plants were 3 feet 9 inches apart either way, and on the bench they were 3 feet apart.

Number of plants of each variety or strain set out in house:—

Hescrow 61-8-15	16
Hescrow 81-1-1	16
Davis Perfect	15
Rennie XXX	17
Deltus	11
Vaughan	11
Number of plants in house	86

Date when fruit of each variety was ready for use:—

Hescrow 61-8-15	May 6, 1921.
Hescrow 81-1-1	May 9, 1921.
Davis Perfect	May 6, 1921.
Rennie XXX	May 6, 1921.
Deltus	May 6, 1921.
Vaughan	May 6, 1921.

The last picking from each variety was on the 2nd of August.

YIELD OF EACH VARIETY FOR FIRST TWO WEEKS FROM ALL PLANTS, EXCEPT DUPLICATES

Variety	Number of Marketable Fruits	Weight of Marketable Fruits		Weight of Unmarketable Fruits		Average Yield of Marketable Fruits per plant for first two weeks
		lb.	oz.	lb.	oz.	lb.
11 Vaughan	62	51	9	.....		4·68
17 Rennie XXX	100	76	3	.....		4·48
11 Deltus	66	49	1	.....		4·46
15 Davis Perfect	71	48	5	1	2	3·22
16 Hescrow 61-8-15	61	44	7	1	4	2·77
16 Hescrow 86-1-1	21	17	11	.....		1·10

YIELD OF EACH VARIETY FOR FIRST THREE WEEKS FROM ALL PLANTS, EXCEPT DUPLICATES

Variety	Number of Marketable Fruits	Weight of Marketable Fruits		Weight of Unmarketable Fruits		Average Yield of Marketable Fruits per plant for first three weeks
		lb.	oz.	lb.	oz.	lb.
11 Vaughan	109	96	3	.....		8·74
17 Rennie XXX	188	131	0	.....		7·70
11 Deltus	105	71	13	.....		6·52
15 Davis Perfect	141	91	11	2	0	6·11
16 Hescrow 61-8-15	95	80	15	1	8	5·05
16 Hescrow 86-1-1	71	49	7	.....		3·08

YIELD OF ALL PLANTS OF EACH VARIETY FROM BEGINNING TO END OF CROP

Variety	Number of Marketable Fruits	Weight of Marketable Fruits		Weight of Unmarket-Fruits		Average Yield of Marketable Fruits per plant
		lb.	oz.	lb.	oz.	lb.
11 Vaughan	457	530	0	24	12	48·18
11 Deltus	634	491	11	8	13	44·69
17 Rennie XXX	1,077	758	2	25	9	44·59
15 Davis Perfect	837	611	13	22	6	40·78
16 Hescrow 61-8-15	716	576	1	21	1	36·00
16 Hescrow 86-1-1	704	492	6	14	7	30·77
Total	4,425	3,460	1	117	0	

Time Spent on Various Operations and Cost of Labour:—

Preparing bed, 9½ hrs. at 40c	$ 3 80
Sowing seed, 2 hrs. at 40c	80
Final planting, 6 hrs. at 40c	2 40
Pollination, 34 hrs. at 40c	13 60
Watering, 156½ hrs. at 40c	62 60
Tying, 7 hrs. at 40c	2 80
Harvesting, 66½ hrs. at 40c	26 70
Cutting down vines, 10 hrs. at 40c	4 00
291½ hrs. at 40c	$116 70
Receipts:	
Sale of 368½ dozen cucumbers at $1.75 per dozen	$645 31
Expenditure:	
291½ hours labour at 40c	116 70
Net profit over labour	$528 61

GARDEN PEAS

A comparison test of fifty-five commercial varieties and strains of peas was made last season with a view of determining the yielding power of each sort. Many of these were found to be quite productive while others produced comparatively poor yields. To the market gardener, or in fact any gardener, the importance of a good-yielding strain cannot be over-estimated. It has been found that by careful selection, a great deal of improvement can be brought about in the way of increased yield.

In the accompanying table will be found the results obtained and it is interesting to note the great variation in the yield of certain varieties and strains obtained from different sources:—

COMPARISON OF GARDEN PEAS

Record Number	Variety	Date of Sowing seed	Date ready for use	Character of Vines as to height	Date of Ripening	Yield per 50 ft. row ripened seed	
						lb.	oz.
0–1088	Richard Seddon	28-IV	29-VI	Dwarf	12-VII	5	15
0–1091	Manifold	"	28-VI	"	9-VII	5	0
0–1089	Sherwood	"	30-VI	Dwarf-medium	8-VII	5	0
0–1058	Pioneer	"	27-VI	Dwarf	9-VII	4	12
0–1056	Marvellous	"	26-VI	"	9-VII	4	4
0–1105	Western Beauty	"	27-VI	Dwarf-medium	9-VII	4	2
0–1062	Little Marvel	"	24-VI	Dwarf	9-VII	3	12
0–1060	Little Marvel	"	24-VI	"	9-VII	3	8
0–1059	Blue Bantam	"	27-VI	"	8-VII	3	8
0–1090	Eldorado	"	27-VI	"	9-VII	3	8

COMPARISON OF GARDEN PEAS—*Concluded*

Record No.	Variety	Date of Sowing seed	Date ready for use	Character of Vines as to Height	Date of Ripening	Yield per 50 ft. row ripened seed	
						lb.	oz.
0–1061	Little Marvel	"	24–VI	"	9–VII	3	3
0–1063	Little Marvel	"	24–VI	"	9–VII	3	2
0–1087	President Wilson	"	27–VI	Dwarf–medium	12–VII	3	2
0–1057	Pioneer	"	27–VI	Dwarf	9–VII	3	0
0–1100	Eight Weeks	"	23–VI	"	4–VII	2	14
0–1106	Danby Stratagem	"	4–VII	Dwarf–medium	16–VII	2	14
0–1145	Progress	"	25–VI	"	7–VII	2	4
0–1065	Dwarf S. 2360	"	26–VI	Dwarf	9–VII	1	14
0–1086	No. 1, Fort William Plant Breeding Station	"	19–VI	Medium–tall	2–VII	5	1
0–1118	Homesteader	"	1–VII	Medium	10–VII	4	13
0–1095	Earliest of All, Fort William Plant Breeding Station	"	19–VI	Medium–tall	2–VII	4	9
0–1101	Reliance	"	6–VII	Medium	14–VII	4	9
0–1066	Gradus	"	23–VI	Medium–tall	8–VII	4	6
0–1103	Alaska	"	20–VI	" "	6–VII	4	2
0–1083	Supreme	"	1–VII	Medium	14–VII	4	1
0–1125	Gradus	"	26–VI	Medium–tall	9–VII	4	1
0–1142	American Wonder, Plant Breeding Station	"	24–VI	Medium	7–VII	3	15
0–1113	Thomas Laxton	"	22–VI	Medium–tall	6–VII	3	13
0–1108	Sutton Excelsior	"	30–VI	Medium	9–VII	3	12
0–1085	Perfection	"	6–VII	"	14–VII	3	8
0–1107	Heroine	"	6–VII	"	16–VII	3	7
0–1112	Potlach	"	6–VII	Medium–tall	16–VII	3	7
0–1084	Peerless	"	5–VII	Medium	14–VII	3	2
0–1072–8	Thomas Laxton	"	25–VI	Medium–tall	5–VII	3	0
0–1102	Laxtonian	"	27–VI	Medium	10–VII	3	0
0–1109	Juno	"	6–VII	Medium–tall	16–VII	2	14
0–1140	Gradus, Plant Breeding Station	"	25–VI	" "	8–VII	2	14
0–1055	May Queen	"	22–VI	" "	6–VII	2	9
0–1111	Morning Star	"	23–VI	Tall	6–VII	6	9
0–1099	Admiral Beatty	"	1–VII	"	12–VII	6	0
0–1093	Pilot	"	27–VI	"	10–VII	5	10
0–1110	Telephone	"	5–VII	"	14–VII	5	5
0–1138	Folger	"	1–VII	"	14–VII	5	2
0–1081	Champion of England	"	3–VII	"	15–VII	5	1
0–1141	Laurentian	"	17–VII	"	3–VII	4	9
0–1092	Amateur Pride	"	1–VII	"	12–VII	4	7
0–1082	Champion of England	"	3–VII	"	15–VII	4	2
0–1097	Admiral Beatty	"	1–VII	"	12–VII	3	12
0–1098	Admiral Beatty	"	1–VII	"	12–VII	3	8
0–1070–1	Danby Stratagem	"	23–VI	"	14–VII	3	3
0–1097	World Record	"	24–VI	"	9–VII	3	2
0–1143	Early Morn	"	23–VI	"	5–VII	3	2
0–1104	Quite Content	"	2–VII	"	12–VII	3	0
0–1122	Gregory Surprise	"	22–VI	"	6–VII	2	14
0–1119	Super Peas V.C	"	1–VII	"	12–VII	0	14

Five-year average. Results recorded in ripened seed.

By comparing the varieties of peas grown for a number of years, an idea can be obtained of the average relative value of each. In fact, this is the only fair comparison upon which to base a criticism.

In the following table will be found the dates relative to four medium tall, and two dwarf, well-known sorts. These may be considered as very good standard varieties in the commercial field. The yields were obtained in all cases from 30 feet of row:—

GARDEN PEAS—FIVE-YEAR TESTS

Record No.	Variety	Year	Planted	Ripe	Weight 1 row–30 ft.		Five Years Average 1 row–30 ft.	
					Lb.	Oz.	Lb.	Oz.
0–7840	McLean Advancer	1917	8–V	2–VIII	1	15	–	–
0–8927	" "	1918	8–V	2–VIII		13	–	–
0–9388	" "	1919	13–V	17–VII	2	0	–	–
0–167	" "	1920	13–V	27–VII	2	3	–	–
0–1068	" "	1921	28–IV	19–VII	2	10	1	14
0–7834	English Wonder	1917	8–V	31–VII	2	5	–	–
0–8929	" "	1918	8–V	31–VII	1	5	–	–
0–9391	" "	1919	13–V	15–VII	1	11	–	–
0–174	" "	1920	13–V	25–VII	1	6	–	–
0–1114	" "	1921	28–IV	10–VII	1	11	1	11
0–7830	American Wonder	1917	8–V	29–VII	1	12	–	–
0–8919	" "	1918	7–V	25–VII	1	12	–	–
0–9395	" "	1919	13–V	12–VII	1	12	–	–
0–161	" "	1920	13–V	27–VII	1	6	–	–
0–1133	" "	1921	28–IV	10–VII	1	14	1	9
0–7817	Gradus	1917	8–V	28–VII	1	0	–	–
0–8936	"	1918	8–V	3–VIII	1	3	–	–
0–9394	"	1919	13–V	26–VII	1	12	–	–
0–156	"	1920	12–V	25–VII	1	3	–	–
0–1125	"	1921	28–IV	9–VII	2	7	1	–
0–7817	Thomas Laxton	1917	8–V	28–VII	1	1	–	–
0–8939	" "	1918	8–V	24–VII		14	–	–
0–9392	" "	1919	21–V	10–VII	1	3	–	–
0–159	" "	1920	21–V	20–VII	1	3	–	–
0–1113	" "	1921	28–IV	6–VII	2	5	1	5
0–7816	Gregory Surprise	1917	8–V	24–VII	1	9	–	–
0–8923	" "	1918	8–V	18–VII		13	–	–
0–9397	" "	1919	13–V	10–VII	1	1	–	–
0–190	" "	1920	13–V	20–VII	1	2	–	–
0–1122	" "	1921	28–IV	6–VII	1	11	1	4

It is important to notice that in regard to the yielding ability of any of these varieties, the length of season from sowing to ready-for-use bears quite an influence upon the yield. In the case of the very early varieties, the yield is noticeably smaller when compared with the yields of the later maturing sorts.

The foregoing table discloses quite clearly the fact that there must be room for some improvement. To this end selection work was commenced with thirteen varieties during the season of 1920. Single plants were selected which showed earliness, vigour and heavy yield. During the season of 1921, this seed was sown and produced some improvement on the general stock from which it had been selected.

In the following table will be found the strains with the respective yields:—

GARDEN PEAS—YIELD FROM SELECTED STRAINS

Record No.	Variety	Date of Sowing seed	Date ready for use	Date of ripening	Character of plants as to height	Yield of ripened seed per 50 ft. row	
						Lb.	Oz.
0–1134	American Wonder (A)	28–IV	27–VI	10–VII	Dwarf	5	9
0–1116	Gradus (A) (Small Pod)	"	30–VI	12–VII	Medium-tall	5	7
0–1128	McLean Advancer	"	29–VI	12–VII	" "	4	14
0–1080	English Wonder	"	27–VI	9–VII	Dwarf	4	9
0–1068–9	McLean Advancer	"	28–VI	12–VII	Medium-tall	4	7
0–1117	Impudence	"	25–VI	8–VII	" "	4	8
0–1115	Gradus (B) (Long Pod)	"	24–VI	8–VII	" "	4	6
0–1135	American Wonder (B)	"	27–VI	9–VII	Dwarf	4	6
0–1121	English Wonder	"	28–VI	9–VII	"	4	1
0–1120	" "	"	28–VI	9–VII	"	4	
0–1054	" " (A)	"	27–VI	9–VII	"	3	
0–1064	Impudence	"	25–VI	8–VII	"	3	5
0–1114	English Wonder	"	28–VI	10–VII	"	2	13

Still another method of increasing the productiveness of the pea was tried, namely by crossing two varieties, and the results have been most gratifying as can be seen by the following tabulation:—

GARDEN PEAS—CROSSING TESTS

Record No.	Variety	Date of Sowing seed	Date ready for use	Date of ripening	Character of plants as to height	Yield of ripened seed per 50 ft. row	
						Lb.	Oz.
0–1136	Gradus x American Wonder	28–IV	28–VI	11–VII	Tall	6	13
0–1126	Gradus x English Wonder	"	27–VI	9–VII	Dwarf-medium	6	5
0–1137	Gregory Surprise x American Wonder	"	27–VI	11–VII	Medium	6	2
0–1123	Gregory Surprise x English Wonder	"	27–VI	9–VII	Medium-tall	6	0
0–1124	English Wonder x Gregory Surprise	"	28–VI	9–VII	" "	5	6
0–1131	McLean Advancer x Gregory Surprise	"	28–VI	9–VII	Medium	5	4
0–1129	Gradus x McLean Advancer	"	28–VI	12–VII	Dwarf	5	1
0–1132	McLean Advancer x Gradus	"	28–VI	9–VII	Medium	4	11
0–1130	Gregory Surprise x McLean Advancer	"	26–VI	9–VII	Medium-long	4	6
0–1127	English Wonder x Gradus	"	28–VI	9–VII	Dwarf	3	11

ORNAMENTAL GARDENING

That part of horticulture which relates to ornamental gardening has, for many years, received much attention in the Horticultural Division because it is believed that beautiful home surroundings and a love for flowers, trees, and shrubs will do much to make the young people have a greater fondness for the country and for the home where they were born.

During the past thirty-four years a great amount of information has been published in the annual reports and in bulletins on ornamental plants compiled from the results of experiments conducted at the Central Farm. The lists of best varieties have been found particularly useful to horticulturists.

In this report further information and other lists are given.

ROSES

The rose garden at the Central Experimental Farm is always of great interest to visitors because of the large number of varieties under test there and the great profusion of bloom, especially in June and July. Comparisons are made of the relative value of the different sorts in regard to hardiness, length of blooming season, form and colour of flower, fragrance, and other characteristics of interest to rose growers.

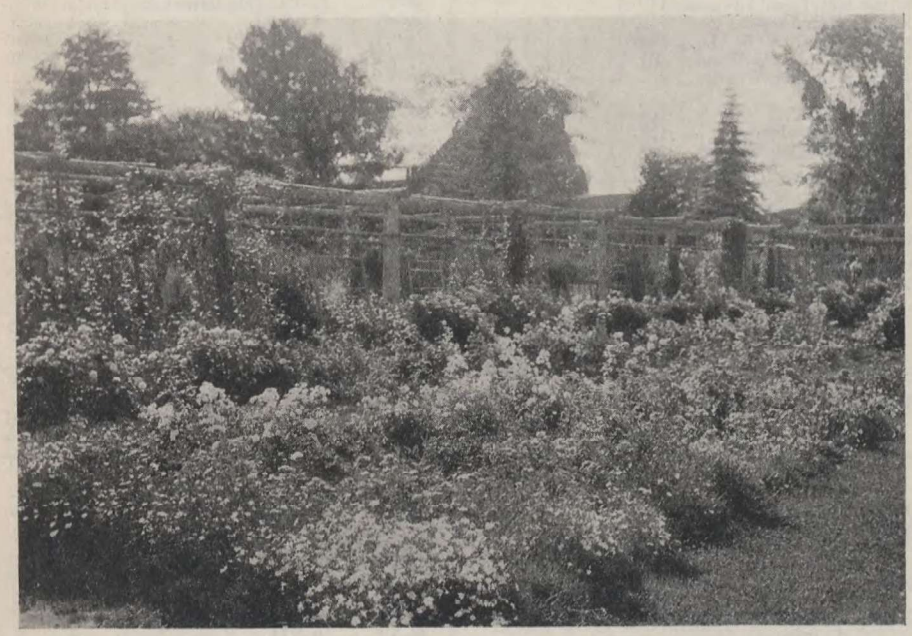


Photo by Frank T. Shutt.

Pergola and Herbaceous Border.—Central Experimental Farm, Ottawa, Ont.

In the following lists will be found the names, with descriptions, of those varieties found most useful or promising in the different groups:—

GOOD HYBRID TEA ROSES FOR THE GARDEN AND LIST OF PROMISING NEWER VARIETIES

There are now many named varieties of Hybrid Tea roses, and a great number of new sorts are introduced each year. There is a large collection at Ottawa and many additional varieties have been tested which have winter-killed. The following list contains the names of those which have proven the most satisfactory. None is absolutely hardy, but, by covering with soil each year, most of them give fairly good satisfaction from year to year, though they are not very permanent and most of them will have to be renewed from time to time in the colder districts.

Following the list of varieties more thoroughly tested is one of the newer varieties of greatest promise:—

GOOD HYBRID TEA ROSES FOR THE GARDEN

Avoca	Rich crimson, fragrant
Betty	Coppery rose, shaded yellow, fragrant
British Queen	Creamy white
Capt. Christy	Delicate flesh colour, deeper in centre
Caroline Testout	Bright warm pink
Dean Hole	Pale silvery rose
Duchess of Wellington	Deep saffron yellow, outside petals orange
Dr. O'Donel Browne	Carmine rose, fragrant
Etoile de France	Velvety crimson, fragrant
Gustav Grunerwald	Carmine pink with yellow base
G. C. Waud	Glowing orange, vermilion
Gruss an Teplitz	Bright crimson, fragrant, very free flowering
Jonkheer J. L. Mock	Deep rose
Killarney	Flesh suffused pale pink, fragrant
La France	Silvery rose, fragrant
Lady Pirrie	Delicate coppery pink
Lieutenant Chaure	Rich crimson, fragrant
Melody	Saffron with primrose border
Mme. Abel Chatenay	Salmon pink
Mme. Melanie Soupert	Pale sunset yellow
Mme. Ravary	Pale orange with deeper centre
Mme. Leon Pain	Silvery flesh, yellow in centre
Mrs. Aaron Ward	Deep yellow, edges of petals white
Mrs. Wakefield Christie-Miller	Soft blush, outside petals deep rose
Pharisaer	Rosy white, shaded pale salmon
Prince de Bulgarie	Blush pink to deep amber
Richmond	Bright light crimson
Simplicity	Pure white, semi-double
W. E. Lippiatt	Velvety crimson
William Shean	Creamy pink

NEWER HYBRID TEA ROSES

Aladdin	Coppery yellow
Emma Wright	Orange
Gorgeous	Orange flushed reddish copper
K. of K.	Scarlet crimson, semi-double
King George V	Deep crimson
La Champagne	Peach, centre chamois
Los Angeles	Coral pink
Lady Maureen Stewart	Scarlet crimson
Marjorie Bulkley	Pale flesh pink, tinted orange
Margaret Dickson Hamill	Straw colour
Mme. Jules Bouche	White centre, shaded pink
Mrs. Arthur Johnson	Orange yellow
Mrs. Henry Morse	Bright rose
Victory (McGredy)	Dark red

GOOD HYBRID PERPETUAL ROSES

Although the Hybrid Tea roses have, to a large extent, displaced the Hybrid Perpetuals in the milder parts of Canada, yet, because of their greater hardiness, the latter are particularly valuable where the temperatures fall low in winter, although without protection they will not for long withstand severe cold.

Following is a list of varieties which have done best at Ottawa:—

A. K. Williams	Bright crimson, very fragrant
Baroness Rothschild	Light pink, very large
Captain Hayward	Light scarlet crimson, fragrant
Charles Lefebvre	Velvety crimson, fragrant
Frau Karl Druschki	Pure white
General Jacqueminot	Scarlet crimson, fragrant
Hugh Dickson	Brilliant crimson, fragrant
Margaret Dickson	White with pale flesh centre
Mrs. John Laing	Soft pink, free bloomer, fragrant
Paul Neyron	Deep rose, very large flowers
Prince Camille de Rohan	Dark crimson, free bloomer, fragrant
Ulrich Brunner	Cherry red, fragrant

PERNETIANA ROSES

The Pernetiana roses or Austrian Hybrids, have become very popular because of their, until recently, uncommon colours, especially in orange and yellow shades.

The following are among the best and most promising:—

Constance	Bright golden and canary yellow
Gottfried Keller	Deep yellow, suffused pink
Mme. Edouard Herriot	Coral red, shaded yellow and rose
Mrs. Farmer	Indian yellow, reverse of petals apricot
Isobel	Orange scarlet, single
Willowmere	Shrimp pink

RUGOSA HYBRID ROSES

Some of the hardiest cultivated roses are among the Japanese or Rugosa Hybrids. These are crosses between the Wild Japanese Rose, *Rosa rugosa,* and other species and varieties. The foliage of most of these hybrids is glossy and attractive in appearance and very free of insects and disease. The flowers are usually either single or semi-double. The fruit or "hips" of most varieties is large and attractive in appearance, so that these roses are particularly ornamental. Following are the best of those tested at Ottawa.

In addition to those in the following list may be mentioned the Agnes rose originated at the Central Experimental Farm and being propagated for introduction:—

Agnes.—Rosa rugosa x Persian Yellow. Habit of plant, texture and colour of leaves resemble *R. rugosa.* The flower is double and pale amber in colour. The form of the bud is good, but the fully opened flower is not so. It is fragrant and blooms early. This is quite distinct from any other Rugosa Hybrid tested.

Rosa rugosa alba	Pure white, single
" " *rubra*	Rose, single
Blanc double de Coubert	Pure white, semi-double
Conrad F. Meyer	Silvery rose, double
F. J. Grootendorst	Bright red, small, double
Mme. Georges Bruant	White, semi-double
Mrs. Anthony Waterer	Deep crimson, semi-double
Rose à parfum de l'Hay	Brilliant red, very fragrant
Rose apples	Pale carmine rose
Roseraie de l'Hay	Dark red, double
Souvenir de Philemon Cochet	Pure white, double

POLYANTHA POMPON ROSES

Some of the most valuable additions to the list of roses are among the Polyantha Pompons. These dwarf varieties bloom continuously from the beginning of the rose season to late in the autumn and are very valuable as border plants in the rose garden. Because of their dwarf compact habit they are easy to protect for winter and hence are particularly desirable.

Aennchen Muller	Bright pink
Cecile Brunner	Blush white, shaded pale rose
Eblouissant	Brilliant deep red
Echo	Pale pink, semi-double, large flowers
Etoile Luisante	Carmine and coral pink
George Elger	Yellow
Jessie	Brilliant red
Katherine Zeimet	White
La Marne	Salmon pink, semi-double
Mrs. W. H. Cutbush	Pale pink
Rodhatte	Clear cherry red, single large flowers
Yvonne Rabier	White

CLIMBING ROSES—LIST OF HARDIEST AND BEST

There is a great need for hardier climbing roses for the colder parts of Canada, and in the breeding work under way in the Horticultural Division combinations of the hardiest climbing varieties available with very hardy wild species have been

made in the hope of obtaining hardier climbing sorts. In the meantime, the following list of varieties, which have proven most satisfactory at Ottawa, will prove useful to intending planters:—

American Pillar	Rose pink, large, single
Christine Wright	Carmine pink, large, double
Crimson Rambler	Bright crimson, double
Dorothy Perkins	Shell pink, small, double
Euphrosyne	Blush pink, small, semi-double
Evangeline	White, tipped pink, large, single, fragrant
Hiawatha	Deep crimson, single
Leontine Gervais	Salmon and rose
Mrs. F. W. Flight	Pink with white centre, semi-double
Paul's Scarlet Climber	Vivid scarlet, semi-double
Source d'Or	Yellow
Tausendchon	Pink. flushed rose, large, semi-double.

GLADIOLUS CULTURE AND LIST OF BEST VARIETIES

The gladiolus is one of the most popular flowers in Canada and deservedly so, as it needs very little care except at planting and digging time. The corms, as obtained from the seedsmen, should be planted from four to six inches deep and about three inches apart, in a sunny position in the garden. The exact date of planting varies according to the locality; when the frost is out of the ground and the soil has dried being the proper time. Sandy loam, well fertilized the previous year, is the ideal soil, but gladioli will do well on heavier soils. In a very light, poor soil they would probably fail in a hot, dry season.

Plant about the middle of May, cultivate constantly to keep down weeds and to keep the surface soil loose. During very dry weather a thorough soaking with water once a week is very beneficial. When cutting the blooms leave at least two sets of leaves on the plant, so that the corm will make its full growth and so be in good condition for growing next year. As the leaves show signs of ripening, or, as generally happens in the colder sections of the country, when the leaves are cut down by frost, dig up the plants and lay in boxes in a frost-proof, but cool, shed for several days. When dry enough to break off easily, remove the stem, old bulbs and cormels from the new corm. Store the latter in paper bags or boxes in a dry place away from frost and fire heat (a vegetable cellar is a suitable place) until planting time comes again. The cormels can be stored in paper bags, but a better method is to keep them in boxes covered with dry sand or soil for the winter. In spring sow these in a row in a corner of the garden and the bulblets will increase in size year by year and probably a few will bloom the second year. There are hundreds of varieties of gladiolus and new ones are put on the market each year by Canadian, American, and European growers, so that to make a list of all the good ones is impossible. The Primulinus hybrids, which are becoming more popular every season, are quite distinct in appearance from the large-growing varieties, having smaller blooms and spikes and generally showing traces of the hooded petals of the primulinus species. The yellow colour of the species, combining with the reds and pinks of the older varieties, produce many delicate shades of apricot and salmon, which make them very effective for home decoration.

The following is a list of good varieties:—

America	Lavender pink
Anna Eberius	Dark velvety red purple
Baron J. Hulot	Dark velvety blue purple
Bertrex	White
Byron L. Smith	Pale orchid colour
Challenger	Rich red, self.
Crimson Glow	Deep scarlet
Dawn	Coral pink
Electra	Cochineal red, yellow throat blotched scarlet
Evelyn Kirtland	Rose pink with red blotch
Faust	Crimson red, throat white, mottled red
Glory of Holland	White
Glory of Noordwijk	Cream yellow
Golden Measure	Deep yellow

List of good varieties—*Concluded.*

Halley	Salmon pink, early
Herada	Brilliant mauve
Ida Van	Deep salmon red
Intensity	Maroon
La Luna	Cream with dark red blotch
Liebesfeuer	Brilliant scarlet
Le Maréchal Foch	Lavender pink, early
Loveliness	Cream, tinted sulfrano pink
Mary Pickford	White
Madame Monnet Sulley	White with dark blotch
Mona Lisa	Pink
Mrs. Dr. Norton	Cream, tips of petals pink
Mrs. Frank Pendleton	Rose pink, blood red blotch
Mrs. Francis King	Flame scarlet
Mrs. Mary Stearns Burke	Canary overlaid apricot
Myrtle	Rose pink, throat primrose
Niagara	Cream yellow, edges often flecked with pink
Panama	Pink
Peace	White, with lavender in throat
Pink Perfection	Apple blossom pink
Prince of Wales	Pale salmon pink
Purple Glory	Deep maroon red, ruffled
Rose Glory	Rose, ruffled
Schwaben	Yellow with mauve lines on throat
War	Deep blood red
White Giant	Large, pure white
Wilbrink	Soft pink, early

Primulinus Hybrids

Alice Tiplady	Orange saffron
Golden Crown	Deep yellow
Linton	Salmon rose, edges deeper
Maiden's Blush	Blush rose
Myra	Deep salmon, yellow throat
Reine Victoria	Cherry rose, cream throat
Shell Pink	Rose pink, light throat

DARWIN TULIPS

The Darwin tulip has become very popular in recent years because of the great vigour and height of the plant, the shapely flowers and the rich colour of its blooms. Many varieties of which some are very similar in appearance have been tested at the Central Experimental Farm. There is such a difference in individual taste that it is difficult to give a list of best varieties that would be so considered by most specialists in this beautiful flower, but the following are all very good and will make an excellent beginning to any collection. The colours under which the different varieties are grouped are those used by the Tulip Nomenclature Committee of the Royal Horticultural Society. Some of the less pleasing shades are not represented here:—

Scarlet-vermilion—
Isis,
Whistler,
City of Haarlem.

Cochineal-red—
Farncombe Sanders,
Prof. Rauwenhof,
Madame de Beynat.

Cerise—
Pride of Haarlem.

Rose—
Roi d'Island,
Princess Elizabeth,
Baronne de la Tonnaye.

Pale rose—
Psyche,
Suson,
Flamingo.

Salmon pink—
Clara Butt.

Crimson maroon—
King Harold,
Millet.

Purple-black—
Zulu,
La Tulipe Noire.

Rosy purple—
Violet Queen,
Mrs. Potter Palmer.

Lilac—
Melicette,
Rev. H. Ewbank.

Lilac, with a lighter edge—
Electra.

Blush—
Margaret (Gretchen),
Zephyr.

Some of those succeeding best when forced in the greenhouse are: Isis, Prof. Rauwenhof, Farncombe Sanders, Roi d'Island, Wm. Pitt, Psyche, Clara Butt, Harry Veitch, Faust, La Tulipe Noire, Rev. H. Ewbank, Wm. Copeland, Margaret (Gretchen).

When forced they should be well rooted in the cellar, and not forced until rather late in the winter for best results.

CHRYSANTHEMUMS IN GREENHOUSE

The greenhouses in the Horticultural Division are limited in extent, and it is not possible to carry on all the experiments with flowers, vegetables and fruits which it is desired to undertake. But the endeavour is made to use what space there is to the best advantage. During the summer months, when there are few crops that can

Darwin Tulips. Forced in Greenhouses.—Central Experimental Farm, Ottawa, Ont. Photo by Frank T. Shutt.

be grown inside to advantage considerable space is devoted to the chrysanthemum, one of the most important florist's flowers and one of the most popular with the public. During the past four years many varieties have been tested for comparison from the commercial, exhibition, and decorative standpoints. Following will be found a list of those which have been tried with notes in regard to them, and after this general list are lists of the varieties considered best in the different sections. This list should prove very valuable to intending growers of chrysanthemums or to those not yet familiar with the best sorts:—

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowers	Florets and form of flowers	Substance of flower	Value	General Notes.
A. S Baldwin	1920-21	Commercial	Bush	Medium	Double		Fine shade of yellow		Fair	xxx	A variety of the highest grade, Gives all perfect flowers, Good foliage.
Acto	1919	Pompon	Bush	Medium	Double	2½	Deep rose pink, running white to centre.	True pompon	Very good	xxx	A good type of pompon. Four flowers to a stem.
Adele Griswold	1920	Commercial	Bush	Medium	Double		Bright pink	Large flowers	Very good	xxx	One of the largest flowered varieties.
Aesthetic	1919-20	Commercial	Bush	Medium	Double	3½	Very bright chrome yellow, under parts of petals much paler.		Good	xxx	Flowers make beautiful effect. Makes a magnificient disbudded bush.
Alex Rowbottom	1919	Single	Bush	Medium	Single	3½	Rosy crimson, white centre, yellow disc.	Cineraria form	Very good	xxx	Numerous flowers on each stem, very free bloomer. Good commercial variety.
Algonac	1919	Commercial	Bush	Medium	Double	3½	White	Heavy clusters	Good	xx	Rather soft for a commercial variety.
Antigone	1919-20	Commercial	Bush	Medium	Double	5	Pure White	Broad twisted petals, heavy clusters	Fair	xxx	A rather soft variety, but of great beauty. A free bloomer
Artisan	1919-20	Exhibition	Single stem	Medium	Double	7	White	Reflexed quilled	Good	xxx	Flowers not large enough.
Ares	1919-20	Single	Bush	Medium	Single	4	Crimson, with yellow zone round a deeper yellow disc.		Very good	xxx	Three flowers to a stem. A remarkably fine crimson.
Autocrat	1919	Commercial	Bush	Late	Double	5	Pure white		Good	xxx	Four on a stem. A splendid late commercial variety, very beautiful flowers.
Baby Doll	1920	Pompon	Bush	Medium	Double	½	Sulphur yellow	True pompon	Good	xxx	A good pompon.
Barney	1919-20	Japanese Anemone	Bush	Medium	Anemone		Very pale yellow tinted with pink, deeper color towards centre.	True anemone	Good		A very fine showy plant.
Betsy Ross	1919	Commercial	Bush	Medium	Double	4½	Very opaque white	Reflexed	Good	xxx	A very good commercial white of fine form.
Billy Burke	1921	Pompon	Bush	Late			Golden bronze	True pompon			Needs another years' trial.

Bob Pulling	1919-20	*Exhibition*	*Single stem*		Double	8	Bright primrose	Reflexed	Good	xxx	A good exhibition variety.
Bol d'Or	1919-20	Exhibition	Single stem	Medium	Double	8	Very pale yellow	Incurved	Good	xxx	A beautiful variety as a bush also.
Bright Eyes	1920-21	Pompon	Bush	Medium	Double	¾	Light pink, yeilow eye	Clusters	Good	xxx	Very attractive pompon.
Brightness	1919-20	Single	Bush	Medium	Single	3½	Brilliant red and yellow bronze with pale yellow eye and deeper yellow disc	Three on a stem	Very good	xxx	A remarkably handsome commercial variety.
Bronze Molly	1921	Single	Bush	Late	Single		Bronze				Needs another trial
Buena	1919-20	Pompon	Bush	Medium	Double	¾	Golden bronze	Clustering	Good	xx	True pompon. A good variety.
C. H. Totty	1920	Exhibition	Single stem	Medium	Double	8	Chestnut red	Reflexed	Very good	xxx	A very good variety.
Caledonia	1919-20	Single	Bush	Medium	Single	3½	Rosy pink, white eye, yellow disc.	Slightly reflexed	Good	xxx	A fine early commercial sort. Four flowers on a stem.
Calumet	1919	Exhibition	Single stem	Medium	Double	8	Light bronze	Incurved	Good	xxx	A good exhibition variety
Captain Cook	1919-20	Pompon	Bush	Medium	Double	2	Lilac	True pompon	Good	xxx	A good pompon. Five flowers in a cluster.
Cecilia Hutchings	1919	Single	Bush	Medium	Single	3	Rosy Lilac, yellow disc	Four whorls	Good	xxx	A good decorative, commercial sort.
Ceddie White	1919-20	Single	Bush	Medium	Single	3½	Rather rich red with a brilliant yellow disc half way up petals	Four whorls	Good	xxx	One of the most strikingly handsome varieties.
Chieftain	1919-20	Commercial	Bush	Medium	Double	4	Rosy pink, very bright.	Incurved	Good	xxx	One of the best pinks. Four flowers to a stem.
Chrysolora	1919-20	Commercial	Bush	Medium	Double	4½	Brilliant canary yellow.	Entirely reflexed.	Very good	xxx	A striking commercial variety. splendid colour.
Colonel Appleton	1919-20	Commercial	Bush	Medium	Double	6	Light chrome yellow	Reflexed	Good	xxx	One of the very best yellows for commercial use. Long stout stems.
Cometo	1919	Pompon	Bush	Medium	Double	2	Bright rosy Lilac	True pompon	Very good	xxx	A fine pink variety. Flowers in heavy clusters.
Crimson Tangle	1919-20	Feathery or Spider	Bush	Medium	Single	3	Crimson tangle	Spidery or thread-like.	Good		A striking variety
December Gem	1920	Commercial	Bush	Late	Double	4	White, suffused with pink	Slightly incurved	Good	xxx	First class late commercial variety. Four flowers on a stem.
Diana	1919-20	Pompon	Bush	Medium	Double	2½	Fine dead white	True pompon	Good	xxx	An extra fine white pompon.

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA —*Continued*

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowers	Florets and form of flowers	Substance of flower	Value	General Notes.
Dorothy Dann	1919-20	Single	Bush	Medium	Single	2½	Salmon bronze	Graceful form	Very good	xxx	A fine decorative single Three flowers on a stem.
Dorothy Dineen	1919	Single	Bush	Novelty	Single	2	White suffused with rose pink.	Quilled petals	Good		A very small single. Four flowers on a stem.
Dorothy Gish	1921	Pompon	Bush	Medium	Double		Pure white				Needs another trial.
Dr. Thos. Pool	1919-20	Pompon	Bush		Double	2	Pale rosy pink		Good	xxx	A good early pompon. Five on a stem.
Early Kitchener	1920-21	Commercial	Exhibition		Double	8	Amaranth with a silvery reverse.	Large flowers	Very good	xxx	Stem, foliage and flowers all very large. A fine variety.
Early Snow	1919-20	Commercial	Bush	Early	Double	3	Pure white		Very good	xxx	A splendid commercial variety Flowers four on a stem, and very solid white.
Elberon	1919-20	Exhibition	Single stem.		Double	8	Pearl pink	Incurved	Good	xxx	Good either as a commercial or for exhibition.
Ethel	1919-20	Single	Bush	Medium	Single	2½	Purest white with bright orange disc.		Very good	xxx	One of the very best of the singles. Splendid for cut flowers. Four on a stem.
Fatouma	1919-20	Exhibition	Single stem.	Medium	Double	8	Yellow buff	Incurved	Good	xxx	Good exhibition variety, having a unique colour.
Felix	1919-20	Single	Bush	Medium	Single	2	Crimson, disc yellow, quills flesh coloured towards centre.	Quilled petals	Poor		Only of value for decorative purposes.
Fire Bird	1919	Pompon	Bush	Early	Double	2	Red		Good		Good early commercial sort. Four flowers to a stem.
Flamingo	1920	Commercial	Bush	Medium	Double		Rich crimson	Beautifully reflexed.	Good	xxx	Good commercial or exhibition variety.
Florence Howlett	1919-20	Commercial	Bush	Medium	Double	2½	Pinkish bronze		Good	xxx	Good pale bronze commercial sort.
Francis Joliffe	1919-20	Exhibition	Single stem.	Medium	Double	9	Yellow streaked with red.	Reflexed	Good	xxx	A first class exhibition variety
Frank Wilcox	1920	Pompon	Bush	Medium	Pompon	1	Bronze yelllow		Good	xxx	Splendid bronze variety, with four flowers to a stem.

Garza	1919–20	Japanese Anemone	Bush	Medium	Anemone	3	White with yellow centre.	Anemone type	Good	xxx	A good pot plant. Very fine bloomer.
Gaston Quinceaux	1919	Commercial	Bush	Medium	Double	4	Rich crimson		Good	xxx	A good commercial sort.
General Bitters	1919	Single	Bush	Medium	Single	2	White suffused with pink, yellow disc.	Short straight petals.	Medium		Of comparatively little value
Gertrude Peers	1919–20	Exhibition	Single stem.	Medium	Double	7	Light crimson	Reflexed	Good	xxx	A good exhibition variety.
Glenarty	1921	Exhibition	Single stem.	Medium	Double	8	Chamois buff			xxx	Promising.
Glorisna	1919–20	Single	Bush	Medium	Single	3	Bronze		Very good	xxx	A fine commercial decorative variety.
Godfrey's Eclipse	1919–20	Commercial	Bush	Medium	Double	4	Rich chrome yellow	Incurved	Very good	xxx	An exceptionally good commercial variety. Four flowers on a stem.
Godfrey's Perfection	1919–20	Single Anemone.	Bush	Medium	Single	3½	Purest white, yellow disc, showing anemone petals.	Anemone type	Good	xxx	A very beautiful variety, especially valuable for post.
Golden Climax	1919–20	Pompon	Bush	Medium	Double	1¾	Brilliant deep yellow	True pompon	Good	xxx	A splendid pompon, slightly warmer in colour than Klondike.
Golden Eagle	1919–20	Commercial	Bush	Late	Double	4¾	Rich chrome yellow		Good	xxx	An exceptionally fine flower, especially when disbudded. Fine shade of yellow. Five on a stem.
Golden Elberon	1920–21	Exhibition	Single stem.	Medium	Double	7		Incurved		xxx	A good exhibition variety.
Golden M. Martha	1919–20	Pompon	Bush	Medium	Pompon	2½	Brilliant yellow	Pompon	Good	xxx	Not quite as good as some others.
Golden Mensa	1919–20	Single	Bush	Medium	Single	3½	Bright pale yellow		Good	xxx	One of the best commercial varieties. Three flowers on a stem.
Golden Star	1919–20	Single	Bush	Medium	Single	2½	Brilliant orange all over.		Good	xxx	Its fine yellow colour is its chief value. Five flowers to a stem.
Gorgeous	1919	Commercial	Bush	Medium	Double	5	Brilliant yellow	Loose form	Good	xxx	A good commercial variety. Six flowers on a stem.
Graf von Fleming	1920	Japanese anemone	Bush	Medium	Single		Pale lavender	Very narrow and refined.	Very good	xxx	One of the most attractive varieties.
Grant B. Schley	1919–20	Single	Bush	Late	Single	4	Bright yellow bronze	Fully reflexed	Very good	xxx	A fine bronze commercial variety. Very late.
H. Marie Totty	1919–20	Single	Bush	Medium	Single	3½	Bright crimson petals, yellow eye, deeper yellow disc, yellow reverse to petals.		Very good	xxx	A very attractive variety. Four flowers on a stem.

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA
—Continued

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowers	Florets and form of flowers	Substance of flower	Value	General Notes.
Harry E. Converse....	1919–20	Exhibition....	Single stem.	Medium....	Double...	6	Bronze.....	Incurved.....	Good.....	xxx	A good exhibition variety.
Helen V. Evans.....	1919–20	Single.....	Bush.....	Medium....	Single.....	3	Beautiful shell pink, yellow disc.	.....	Very good..	xxx	A lovely decorative pink. Three flowers to a stem, four whorls.
Helene Frick.....	1920	Commercial..	Bush.....	Medium....	Double...	3	Rosy pink.....	.....	Good.....	xx	Good late commercial sort. Three flowers to a stem.
Highland.....	1919–20	Decorative...	Bush.....	Early.....	Double...	2½	Pure white with deep yellow disc.	Twisted petals..	Good.....	xx	Very early, but stems are rather weak.
Hilda Canning.....	1919–20	Pompon.....	Bush.....	Medium....	Double...	1	Rich bronze.....	Pompon.....	Good.....	xxx	A very fine pompon.
Hilda Wells.....	1919–20	Single.....	Bush.....	Medium....	Single.....	2	Red terra cotta, yellow eye, deep yellow disc, very bright.	.....	Good.....	xxx	A fine commercial decorative sort. Five flowers on a stem, three whorls.
Hortos Tolsanus.....	1919–20	Commercial..	Bush.....	Medium....	Double...	4	Brilliant yellow bronze	Slightly reflex..	Good.....	xxx	One of the very best commercial bronzes. Very brilliant in colour.
Howard (Gould).....	1919	Commercial..	Bush.....	Medium....	Double...	4	Rich golden bronze...	Slightly reflexed.	Good.....	.....	A first class commercial bronze
Ida.....	1919–20	Pompon.....	Bush.....	Medium....	Pompon..	2	Rich chrome yellow..	Pompon.....	Good.....	xxx	An extra early pompon of good quality. Five flowers on a stem.
Irene.....	1919–20	Single.....	Bush.....	Medium....	Single....	3½	Pure white, bright yellow disc.	.....	Good.....	xxx	A first class commercial sort. Four on a stem. Three whorls.
Irene Craig.....	1919–20	Single.....	Bush.....	Medium....	Single.....	2½	Pure white, yellow disc.	Slightly reflexed.	Medium....	xx	A good early commercial sort. Three whorls.
Irma.....	1919	Commercial..	Bush.....	Medium....	Double...	3½	White.....	Loose form.....	Medium....	xx	Poor keeping sort.
Ivy.....	1919–20	Pompon.....	Bush.....	Medium....	Double...	2½	Deep rose pink.....	Pompon.....	Good.....	xxx	A fair type of pompon. Five flowers to a stem.
J. R. Booth.....	1920–21	Exhibition....	Single stem.	Medium....	Double...	8	Lemon yellow.....	Reflexed.....	Good.....	xxx	Similar in shape to Nag-ir-Roc of which it is a sport originated in the Horticultural Division, Ottawa.

Jas. Fraser	1919-20	Exhibition	Single stem.	Medium	Double	8	Brilliant crome yellow.	Fully reflexed	Good	xxx	A very fine exhibition variety.
Jessie Curtis	1919-20	Single	Bush	Medium	Single	2½	Bright red, yellow disc.		Good	xxx	A very bright decorative variety. Very small flowers, distinct in colour.
John	1919-20	Pompon	Bush	Medium	Double	2	White, with very bright yellow disc.	Pompon	Good	xxx	A good white pompon. Heavy clusters.
Josephine	1919-20	Single	Bush	Medium	Single	4	Light chrome yellow, deep yellow disc.		Good	xxx	Lovely decorative variety; three on a stem; three whorls
Katewood	1919-20	Single	Bush	Medium	Single	3½	White, suffused with pink, deep yellow disc.		Very good	xxx	A good commercial single. Good colour. Four on a stem.
Kathleen May	1919-20	Semi-double	Bush	Medium	Semi-double	3	Light crimson yellow disc.	Slightly incurved.	Very good	xxx	A splendid commercial variety of attractive colour. Flowers in large clusters. Five in a cluster.
Kitty Bourne	1919-20	Single	Bush	Medium	Single	2½	Bright warm yellow, deep yellow disc.		Very good	xxx	A good commercial variety. Six on a stem. Four whorls.
King of the Plumes	1919-20	Feathery	Bush	Late	Double	4	Brilliaut orange yellow.		Very good	xxx	A distinct variety of fine colour. Three flowers on a stem.
Kitty Connel	1919-20	Single	Bush	Medium	Single	3	Dull rose with faint white eye and yellow disc.		Good	xxx	A good single. Very free bloomer. Flowers in clusters of six. Two whorls.
Klondike	1919	Pompon	Bush	Medium	Double	1½	Rich golden yellow	Pompon	Very good	xxx	One of the most beautiful pompons. Six flowers on a stem.
Lady Carmichael	1919-20	Exhibition	Single stem.	Medium	Double	8	White	Reflexed twisted.	Good	xxx	A very fine exhibition variety.
Lady Hopetoun	1919-20	Exhibition	Single stem.	Medium	Double	8	Soft rose pink	Reflexed	Good	xxx	Rather weak in the stem, but a fine coloured exhibition variety.
Lady Rose	1919-20	Single	Bush	Medium	Single	3½	Bright reddish pink, yellow disc.		Good	xxx	A good commercial variety of distinct colour.
Leilah	1919-20	Pompon	Bush	Medium	Double	2½	Pale rose lilac	Pompon	Good	xxx	Very early and has good lasting qualities. Four on a stem.
Liberty Bond	1919-20	Commercial	Bush	Medium	Double	4	White	Slightly reflexed.	Very good	xxx	A good early commercial variety.
Lilac Caprice	1919-20	Decorative	Bush	Medium	Double	4	Lilac turning white towards centre of flowers.		Good	.....	Very showy type. Three to a stem.
Lillia	1919-20	Anemone Pompon.	Bush	Medium	Double	2½	White with anemone centre, pale yellow.	Large anemone centre.	Very good	xxx	One of the most beautiful pompons. Four in a cluster.

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA
—Continued

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowers	Florets and form of flower	Substance of flower	Value	General Notes
Lily Neville	1919-20	Single	Bush	Medium	Single	3	Pure white with yel low disc.	Partly reflexed	Very good	.....	A good commercial variety of the Mensa type. Three on a stem.
Little Tot	1920	Pompon	Bush	Medium	Double	¾	Pinky white	True pompon	Medium	xxx	Fine pompon. One of the smallest.
Lord Hopetoun	1919	Exhibition	Single stem.	Medium	Double	6	Light crimson showing gold on reverse of petals.	Reflexed	Good	xxx	Good colour. A good variety.
Louisa Pockett	1919-20	Exhibition	Single stem.	Medium	Double	8	Pure white	Incurved	Good	xxx	A first class, strong-growing exhibition variety.
Loyalty	1919-20	Pompon	Bush	Medium	Double	2½	Faintest shade of pink, white centre.	Pompon form	Very good	xxx	A beautiful pompon, and very early. Four on a stem.
Margaret	1919-20	Single	Bush	Medium	Single	4	White, yellow disc	Cactus form and slightly reflexed.	Medium	.....	A good decorative variety. Flowers three on a stem; three whorls.
Margaret Clark	1921	Pompon	Bush	Medium	Double	-	Rose pink	.....	.....	.....	Needs another trial.
Margaret Lunn	1919-20	Single	Bush	Medium	Single	3½	Opening buff but turning white.	Very open petals	Good	xxx	A fine decorative single. Three flowers on a stem.
Marietta	1919-20	Single	Bush	Medium	Single	3	Crimson terra cotta, yellow disc.	.....	Good	xxx	A fine single with flower showing a few anemone petals in centre.
Mary Pickford	1921	Pompon	Bush	.....	Double	-	White	.....	.....	.....	Needs another year's trial.
Mary Richardson	1919-20	Single	Bush	Medium	Single	2½	Deep flesh pink	True single	Good	xxx	A good commercial of a somewhat novel colour. Four on a stem; four whorls.
Mary Walcot	1919-20	Pompon	Bush	Medium	Double	2	Primrose buff	True pompon	Good	xxx	A fine early pompon.
Mayor Weaver	1919	Commercial	Bush	Late	Double	3½	White suffused with rose.	Incurved	Good	xxx	Very fine late commercial variety.
Meteor	1919-20	Anemone Pompon.	Bush	Early	Double	2	Pale primrose, deeper yellow centre.	.....	Very good	xxx	A very good type. Five on a stem.
Meudon	1919-20	Exhibition	Single stem.	Medium	Double	9	Lilac pink, very soft colour.	Fully reflexed	Good	xxx	A first class exhibition variety of fine colour.

Midnight Sun	1919	Commercial	Bush	Early	Double	4	Bright pale yellow	Incurved	Good	xxx	A handsome commercial variety of more than average beauty.
Mildred Presby	1919–20	Single	Bush	Medium	Single	4½	Beautiful solid pink, with large yellow disc.		Very good	xxx	One of the finest commercial varieties. Three on a stem.
Millicent Piper	1919–20	Single	Bush	Medium	Single	3	White, yellow disc		Good	xxx	A first class single variety of the Mensa type. Three on a stem.
Minnie Bailey	1919	Commercial	Bush	Late	Double	5	Very bright pink		Good	xxx	A good late commercial. Three on a stem.
Mizpah	1919	Single	Bush	Medium	Single	2	Amaranth	True single	Good		Good commercial variety, early and free flowering.
Miss F. Collier	1919–20	Commercial	Bush	Early	Double	3	Very solid White		Good	xxx	A splendid commercial variety; would be good if disbudded, as flowers of good form: five on a stem.
Miss Ruth Bergen	1919	Single	Bush	Medium	Single	4	Deep rosy lilac, white eye, yellow disc.	Reflexed	Good	xxx	Very good single of attractive appearance; four on a stem; three whorls.
Mrs. Baer	1919–20	Commercial	Bush	Late	Double	4½	Very brilliant deep yellow.		Very good	xxx	One of the very finest late yellows; three on a stem.
Mrs. Butterfield	1919	Commercial	Bush	Medium	Double	3½	White		Good	xxx	A good dwarf commercial; three on a stem.
Mrs. David Lloyd-George.	1921	Exhibition	Single stem.	Medium	Double		Brilliant crimson				Needs another year's trial.
Mrs. E. Kershaw	1921	Exhibition	Single stem.		Double		Bronze				Needs another year's trial.
Mrs. Filkins	1919–20	Single	Bush	Late	Single	4	Bright rich yellow	Spidery form	Good		A striking and novel variety.
Mrs. G. C. Kelly	1919–20	Exhibition	Single stem.	Medium	Double	8	Pale crimson, pink on reverse of petals.	Incurved	Good	xxx	A good exhibition variety.
Mrs. G. L. Wigg	1919–20	Exhibition	Single stem.	Medium	Double	10	Bright but deep yellow.		Very good	xxx	A monster exhibition flower of very striking appearance.
Mrs. Gilbert Drabble	1919–20	Exhibition	Single stem.	Medium	Double	10	Ivory white, very solid colour.	Reflexed	Very good	xxx	A first class exhibition bloom.
Mrs. H. S. Firestone	1921	Exhibition	Single stem		Double	8	Pink				Needs another year's trial.
Mrs. J. Gibson	1920	Exhibition	Single stem.	Medium	Double	8	Light pink, shading to deeper; lines on ends petals.	Reflexed			A good exhibition variety.
Mrs. Jeffries	1921	Exhibition	Single stem.	Medium	Double		Old rose				Needs another year's trial.

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA
—Continued

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowers	Florets and form of flowers	Substance of flower	Value	General Notes.
Mrs. Loo Thompson...	1919-20	Single.....	Bush.....	Medium....	Single.....	3½	Pale primrose, deep yellow disc.	.....	Very good..	.....	A very attratcive single of lovely colour; Mensa type; four on a stem.
Mrs. Mickle.....	1919-20	Single.....	Bush.....	Medium....	Single.....	2½	Purest white.....	.....	Good	xxx	An exceptionally fine decorative single; four on a stem; three whorls.
Mrs. Middleton.....	1919-20	Single.....	Bush.....	Medium....	Single.....	2¾	Deep primrose.....	Slightly reflexed.	Good.....	xxx	A good commercial, but of small type; four on a stem.
Mrs. Nellie Klevis.....	1919-20	Pompon.....	Bush.....	Medium....	Double...	2	Rose pink, shading to white in centre.	....	Good.....	xxx	Good commercial showy pompon: four on a stem.
Mrs. O. H. Kahn.....	1919-20	Commercial..	Bush.....	Late.....	Double...	4	Bright red and yellow bronze.	Incurved.....	Very good..	xxx	A very beautiful commercial sort; colour is especially striking.
Mrs. Paul Moore.....	1919	.....	Bush.....	.....	Double...	.....	.....	.....	.....	.....	Another year's trial.
Mrs. R. C. Pulling.....	1919-20	Exhibition....	Single stem.	Medium....	Double...	9	Very brilliant yellow.	Reflexed.....	Good.....	xxx	A first class exhibition or commercial sort.
Mrs. Roberts.....	1919-20	Single.....	Bush.....	Medium....	Single.....	3	Pale rose pink, yellow disc.	Close form.....	Good.....	.....	Of fair commercial value; stems somewhat short.
Mrs. Ruth Twombeg..	1921	Exhibition....	Single stem.	Medium....	Double...		Bronze.....	.....	.....	.....	Needs another year's trial.
Mrs. Swinburne.....	1919-20	Commercial..	Bush.....	Late.....	Double...	5	Creamy white, yellow towards centre.	.....	Good.....	xxx	Splendid late commercial variety.
Mrs. U. P. Hedrick....	1919-20	Single.....	Bush.....	Early.....	Single.....	4	Rather brigbt amaranth, yellow disc.	Twisted petals..	Medium....	.....	Good early commercial variety; four on a stem; three whorls.
Mrs. Wm. Duckham...	1919-20	Commercial..	Bush.....	Late.....	Double...	5	Bright rose pink.....	.....	Very good..	xxx	Very fine commercial variety; six on a stem.
Mrs. Wm. H. Waite....	1919	Single.....	Bush.....	Medium....	Single.....	4	Lovely shade of palest rose pink on opening, turning wbite with age.	Cactus form....	Very good..	xxx	Very lovely flower of refined appearance; heavy clusters; four whorls.
Mrs. Wm. Walker.....	1919-20	Commercial..	Bush.....	Late.....	Double...	5	Very pale yellow.....	Reflexed.....	Good.....	xxx	Has fair commercial qualities; four on a stem.

Mrs. Wiltshire	1919	.....	Bush	Medium	Double	3½	Very brilliant and striking yellow.	Incurved	Good	xxx	Good commercial variety, with a remarkable colour.
M. Loiseau Rousseau	1919-20	Exhibition	Single stem.	Medium	Double	8	Deep rose pink	Reflexed	Good	xxx	A fine exhibition variety.
Mount Greenwood	1919-20	Commercial	Bush	Medium	Double	4	Pale rose pink	Reflexed	Very good	xxx	A splendid commercial variety of exceptional beauty of colouring; large clusters.
Nag-ir-roc	1919-20	Exhibition	Single stem.	Medium	Double	4	Golden bronze	Reflexed	Very good	xxx	First class either as an exhibition or commercial variety.
Naomah	1919-20	Exhibition	Single stem.	Medium	Double	7	Pure white	Incurved	Good	xxx	Good as a commercial bush.
Nellie Brown	1919	Pompon	Bush	Medium	Double	2½	Pure white, very solid	Pompon form	Good	xxx	Fine white pompon.
Nerissa	1920	Exhibition	Single stem.	Medium	Double	8	Bright rosy mauve	.....	Good	.....	Fine form, stiff upright growth rigid stem.
November Pearl	1919-20	Pompon	Bush	Medium	Double	2	Pearl white	.....	Good	.....	Beautiful flower, but had rather weak stems.
O. H. Broomhead	1919-20	Commercial	Bush	Medium	Double	5	Rose pink, showing lighter shade of pink under petals towards centre.	Reflexed	Good	xxx	Good commercial variety.
Oconto	1919-20	Commercial	Bush	Medium	Double	3½	Creamy white, very dense.	.....	Very good	xxx	Good early commercial variety.
October Herald	1919-20	Commercial	Bush	Medium	Double	4½	Golden yellow bronze, strong colours.	Reflexed twisted petals	Very good	xxx	An extra fine commercial of striking colour.
October Queen	1919-20	Commercial	Bush	Medium	Double	4	Purest white	twisted petals	Good	xxx	Very free bloom, suggestive of a mass of snow.
Odessa	1919-20	Exhibition	Single stem.	Medium	Double	8	Bright yellow	Incurved	Good	xxx	Very fine and reliable, tall yellow exhibition sort.
Old Rose	1919-20	Japanese anemone.	Bush	Medium	Double	3½	Pale warm buff with pale yellow anemone centre.	Anemone	Good	xxx	Very good anemone flowered variety, four on a stem.
Orange Queen	1921	Commercial	Bush	Medium	Double	.....	Orange	.....	.....	.....	Needs another year's trial.
Ouray	1919-20	Pompon	Bush	Medium	Double	1½	Red bronze, dark and rich.	Pompon	Good	xxx	Good pompon; four on a stem.
Pacific Supreme	1919-20	Commercial	Bush	Medium	Double	4	Pale rose pink	.....	Good	xxx	Good early commercial variety: three on a stem.
Peter Marcel	1919	Commercial	Bush	Medium	Double	4½	White streaked with deep purple, not very definite.	Slightly incurved	Good	xx	Good commercial but of indefinite colour.
Phillip Pieri	1921	Exhibition	Single stem.	Medium	Double	.....	Chestnut bronze	.....	.....	.....	Needs another year's trial.

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA
—Continued

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowers	Florets and form of flowers	Substance of flower	Value	General Notes.
Pigmy	1920	Pompon	Bush	Medium	Double	2			Very good	xxx	Very good commercial variety. Very robust plant.
Polly Duncan	1919	Single	Bush	Medium	Single	2½		Upright petals	Medium	xx	Rather poor variety; three on a stem.
Polly Rose	1919	Commercial	Bush	Early	Double	4	White	Slightly incurved.	Good		Good early variety
Pomona	1919–20	Anemone	Bush	Medium	Double	2½	White with very pale yellow centre.	True anemone	Good	xxx	Beautiful commercial variety.
Portia	1919–20	Single	Bush	Medium	Single	4½	Yellow suffused with bright crimson.	Cactus form	Good	xxx	Beautiful decorative variety; three on a stem.
President J. Everitt	1919–20	Exhibition	Single stem	Medium	Double	6	Chamois buff	Incurved	Good	xxx	Not good enough.
Purity	1919–20	Commercial	Bush	Medium	Double	4½	Snow white	Incurved	Very good	xxx	Splendid commercial white.
Queen Margaret	1919–20	Japanese anemone.	Bush	Medium	Double	3½	Delicate pearl pink	True anemone	Good	xxx	Very fine anemone; four on a stem.
Queen Mary	1919	Exhibition	Single stem.	Medium	Double						Discarded for being too early for exhibition.
Ramapo	1919–20	Exhibition	Single stem.	Medium	Double		Yellow	Incurved	Good	xxx	Grown as a bush in 1920. Too small for exhibition. Good commercial variety.
Rose Fay	1921	Exhibition	Single stem.	Medium	Double		Rose pink			xxx	Needs another year's trial
Rose Perfection	1920–21	Commercial	Bush	Early	Double	3			Very good		Extra fine pink; very good for decoration.
Savannah	1919–20	Anemone pompon.	Bush	Medium	Double	1¼	Brilliant golden yellow		Very good	xxx	One of the very best pompons. Extra fine colour. Five on a stem
Sea Shell	1919–20	Single	Bush	Early	Single	4½	Shell pink, yellow disc.	Cactus form	Good	xxx	Good commercial variety; nice colour. Four on a stem.
Sir E. Letchworth	1921	Exhibition	Single stem.	Medium	Double	9	Deep rose pink				Needs another year's trial
Smith Imperial	1919–20	Commercial	Bush	Medium	Double	3	Creamy white; very solid in colour.	Reflexed	Good	xxx	Good commercial variety. Very rugged type. Four on a stem.

Solomon's Gold	1919-20	Commercial	Bush	Medium	Double	5	Brilliant chrome yellow.	Reflexed	Good	xxx	Very good commercial sort of fine colour. Three on a stem
Sun Glow	1919-20	Commercial	Bush	Medium	Double	4	Rich, glowing yellow	Reflexed twisted petals.	Very good.	xxx	Very fine yellow
Susquehanna	1919	Pompon	Bush	Medium	Double	1½	Rich full yellow		Good	xxx	Fine example of this type. Four on a stem. Cut-leaved
Sylvia Slade	1919-20	Single	Bush	Medium	Single	3	Purple rose with pure white ring around yellow disc.	Cineraria type	Good	xxx	Magnificient commercial variety of wonderfully good appearance. Two in a whorl; heavy clusters.
Thank sgiving Queen	1919-20	Commercial	Bush	Late	Double	5	Creamy white		Good	xxx	Very fine late commercial sort; free bloom in heavy clusters.
Thelma	1919	Pompon	Bush	Early	Double	2¼	Buff centre, dull crimson outer petals	Pompon	Good	xxx	Fairly good pompon. Five on stem.
Tiger	1919	Commercial	Bush	Medium	Double	4½	Very pale chrome yellow.	Incurved	Verygood	xxx	Very Handsome yellow. Five bold flowers; four on a stem.
Timothy Eaton	1919-20	Commercial	Bush	Late	Double	5	White	Japanese incurved.	Good	xxx	First class commercial,especially for disbudding.
Titania	1919-20	Exhibition	Single stem.	Medium	Double	9	White	Incurved	Good	xxx	Promising exhibition sort.
Uvalda	1919-20	Pompon	Bush	Early	Double	2½	White	Pompon	Good	xxx	Very early, good white pompon.
Venetta	1919	Commercial	Bush	Late	Double	5	Ivory white	Incurved	Very good	xxx	Magnificent late commercial sort of beautiful colours. Four on a stem.
Vermont	1919-20	Commercial	Bush	Medium	Double	4	Lilac pink		Good	xxx	Fine variety. Made a good exhibition sort in 1920 as a single stem.
Victory	1919	Commercial	Bush	Medium	Double	5	Ivory white	Incurved	Good	xxx	One of the finest commercials. Four to a stem.
Vivian Cook	1919-20	Single	Bush	Medium	Single	3	Very brilliant pale yellow, dark orange disc.		Good	xxx	Good commercial variety of lovely colour.
W. H. Stevens	1919	Commercial	Bush	Medium	Double	5	Brilliant chrome yellow.		Good	xxx	Good commercial variety. Three on a stem.
War Bride	1919-20	Pompon	Bush	Early	Donble	2	Crimson	Pompon form	Good	xxx	Fine coloured pompon. Five on a stem.
Wells Late Pink	1919-20	Commercial	Bush	Medium	Douhle	5	Beautiful soft pink	Loose form	Good	xxx	Beautiful commercial variety. Three on a stem.
White Chieftain	1919-20	Commercial	Bush	Medium		4	White	Incurved in form	Good	xxx	One of the best commercial varieties; clusters.

LIST OF CHRYSANTHEMUMS TESTED IN THE GREENHOUSES OF THE HORTICULTURAL DIVISION, OTTAWA
—Concluded

Name	When described	Section	Grown as bush or single stem	Season early medium late	Single Double	Diameter of flower inches	Colour of flowe.s	Florets and form of flowe.s	Substance of flower	Value	General Notes
White Lillian Doty....	1919–20	Pompon.....	Bush.....	Early.....	Double...	2½	White.....	Pompon form...	Good.....	xxx	Good early pompon; clusters.
White Mensa.....	1919–20	Single.....	Bush.....	Medium....	Single.....	4	Pure white, yellow disc.	Slightly reflexed	Very good..	xxx	Magnificent commercial variety; three to a stem; three whorls.
White Midget.....	1919–20	Pompon.....	Bush.....	Medium....	Double...	¼	White.....	.....	Very good..	xxx	Good variety of pompon; clusters.
William H. Waite.....	1919–20	Exhibition....	Bush.....	Medium....	Double...	.....	Reddish bronze.....	Reflexed.....	Good.....	xxx	Grown as disbudded bush, but is of exhibition size.
Wm. Mense.....	1919–20	Exhibition....	Single stem.	Medium....	Double...	9	Magenta.....	Reflexed.....	Good.....	xxx	Beautiful exhibition flower.
Wm. Rigby.....	1919–20	Exhibition....	Single stem.	Medium....	Double...	9	Brilliant chrome.....	Reflexed.....	Good.....	xxx	First class exhibition sort.
Wm. Turner.....	1919–20	Exhibition....	Single stem.	Medium....	Double...	8	Pure white.....	Incurved.....	Good.....	xxx	First class commercial exhibition sort.....
Xmas gold.....	1919–20	Pompon.....	Bush.....	Late.....	Double...	1	Deep brilliant orange	True pompon....	Very good..	xxx	Really good late pompon; heavy clusters to a stem.
Yellow Turner.....	1919–20	Exhibition....	Single stem.	Medium....	Double...	8	Palest possible yellow	Incurved.....	Good.....	xxx	Very fine exhibition sort.....
Yondota.....	1919–20	Single.....	Bush.....	Medium....	Single.....	4	Pale rose pink, yellow disc.	Slightly incurved.	Good.....	xx	Stems weak at neck; four on a stem; six whorls
Yvonne.....	1919	Single.....	Bush.....	Medium....	Single.....	3	Pale salmon bronze....	.....	Good.....	xxx	Fine decorative single. Very free bloomer.
Zenobia.....	1919	Pompon.....	Bush.....	Early.....	Double...	1½	Deep lemon yellow....	.....	Good.....	xxx	Good yellow pompon; heavy clusters.

CHRYSANTHEMUMS

Best Exhibition Varieties

White—
Mrs. Gilbert Drabble,
William Turner,
Louisa Pockett,
Mrs. Chas. Johnson.

Yellow—
J. R. Booth,
Mrs. R. C. Pulling,
William Rigby,
Yellow Turner,
Corp. J. Fred Piper.

Pink—
Mrs. J. Gibson,
Meudon,
M. L. Rousseau,
Elberon,

Pink—*Con.*
Mrs. J. Leslie Davis,
Sir E. Letchworth.

Bronze—
Nag-ir-roc,
W. H. Waite,
Glenarty,
Sgt. W. E. Young,
Harry E. Converse.

Red—
C. H. Totty.
Gertrude Peers.

Buff—
Cheyenne,
Mrs. W. S. Firestone.

Best Commercial Bush Varieties

White—
Early Snow,
Liberty Bond,
Betsy Ross.

Yellow—
Chrysolora,
Godfrey Eclipse,
Golden Eagle.

Pink—
Chieftain,
Rose Perfection,
Mount Greenwood,
Mrs. Wm. Duckham.

Bronze—
Hortos Tolsanus,
Howard Gold.

Best Single Varieties

Bronze—
Gloriana,
Grant B. Schley,
Bronze Molly.

White—
White Mensa,
Mrs. Mickle,
Lily Neville,
Ethel.

Yellow—
Golden Mensa.

Pink—
Mildred Presby,
Caledonia.

Primrose—
Mrs. Loo Thompson.

Crimson—
H. Marie Totty.

Best Anemone Flowered Varieties

White, Pale Yellow Centre—
Pomona.

Pale Lavender—
Graaf von Fleming.

White—
Godfrey Perfection.

White, Yellow Centre—
Garza.

Buff—
Old Rose.

Bronze—
Barney.

Pink—
Queen Margaret.

Best Pompon Varieties

White—
White Lillian Dotty,
Diana,
John.

Yellow—
Zenobia,
Klondike,
Xmas. Gold,
Golden Climax.

Bronze—
Hilda Canning,
Frank Wilcox.

Pink—
Bright Eyes,
Acto.

Lilac—
Captain Cook.

NEW EXHIBITION VARIETY OF CHRYSANTHEMUM ORIGINATED IN THE HORTICULTURAL DIVISION.

When the chrysanthemums were in bloom in the greenhouses of the Horticultural Division in the autumn of 1919, Mr. Jas. McKee, Greenhouse Specialist, observed a sport among the fine lot of Nag-ir-roc growing that year. The flower of one plant was quite distinct in colour from Nag-ir-roc, though resembling it in other respects and in the appearance of the plant itself. This was named J. R. Booth in the autumn of 1920 in honour of one of the most noted men of Ottawa, Mr. J. R. Booth. A brief description of this new variety will be found in the list of chrysanthemums tested. It is an Exhibition variety, the flower growing eight to nine inches in diameter when the plant is trained to a single stem. The flower is double with reflexed petals, and is of an attractive lemon yellow colour. It is considered a valuable addition to the list of good exhibition varieties.