DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

DIVISION OF HORTICULTURE

REPORT

OF THE DOMINION HORTICULTURIST

W. T. MACOUN

FOR THE YEAR 1928

Chrysanthemum, Cathrine Motherwell, originated in the Division of Horticulture, Central Experimental Farm, Ottawa.

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REPORT OF THE DIVISION OF HORTICULTURE

W. T. MACOUN, DOMINION HORTICULTURIST

Following is the forty-second annual report of the Division of Horticulture, and the thirtieth presented by the present Chief of the Division since his appointment in 1898.

During the past forty-two years a large amount of useful information has been published in these reports, which, it is believed, has been of great value to those interested in fruits, vegetables, and ornamental plants, not only in Canada but in other countries as well.

Notwithstanding the many other agencies in Canada for disseminating information on horticultural matters, the correspondence continues to increase, and the calls on the time of members of the staff to give lectures, judge at exhibitions, write articles, and give advice is greater from year to year. The correspondence has risen from 247 letters received in 1889 to 11,079 received and 10,019 dispatched in 1928.

Bulletins published during the year were: Bulletin No. 60, New Series, Annual Flowers, reprint; Circular No. 63, How to Make and Use Hotbeds and Cold Frames; Pamphlet No. 96, New Series, Nitrogen, Phosphoric Acid and Potash Starvation at Different Stages of the Growth of Fragaria; and Bulletin No. 107, New Series, Standard Descriptions of Vegetables—Peas.

As in the past, it has been the faithful work of all the members of the staff which has made it possible to carry on, satisfactorily, the many projects in the Division of Horticulture, and has enabled those who have prepared this report to do so.

The part of the report under the head of Pomology, with the exception of the Descriptions of Apples of Northern Spy Parentage, has been prepared jointly by Mr. M. B. Davis, B.S.A., Chief Assistant, and Mr. H. Hill, B.S.A., M.Sc., Assistant in Research; that part relating to Vegetables by Mr. T. F. Ritchie, Assistant in Vegetable Gardening. Miss I. Preston, Specialist in Ornamental Horticulture, has prepared the part concerning New Varieties of Ornamental Plants Originated in the Division of Horticulture. The remainder of the report has been prepared by the Dominion Horticulturist.

THE SEASON

The successful cultivation of plants depends so much on the weather and certain climatic conditions throughout the year that it is always of interest to record the character of the season, and it is hoped the following notes will be of interest.

At the beginning of the year 1928 there was little snow on the ground at Ottawa, only three or four inches on the level, and, fortunately, there was no very severe cold while there was so little. By the end of January there were about twenty-two inches of snow on the land. It was below zero on fourteen days in January, the lowest being -20° F. on the 30th. There were no long spells of cold weather.

While there were a few very cold days in February, it was moderately cold to mild on the whole, the temperature rising above freezing on six days, and it was considerably above zero on seventeen days during the month. It was below zero on eleven days. The three coldest days of the month and of the winter were –25° F. on the 3rd, –25° F. on the 6th, and –23° F. on the 26th. By the end of February there were but fifteen inches of snow on the ground.

March was a mild month, the temperature rising above zero on sixteen days. It was below zero on five days. The lowest temperature was –10° F. on the 6th, and the highest 49° F. on the 24th. At the end of the month nearly all the ground was still covered with snow.

April was a mild month, the temperature being above zero on every day. The highest temperature was 72° F. on the 7th, and the lowest 13° F. above on the 15th. By the 7th the fields were bare, and by the 12th it was possible to dig, although a severe frost on the 16th froze the ground again for a short time. Taking the 12th as the date when the frost was out enough to dig, the average date for being able to dig for the past thirty-one years is April 11.

The month of May was moderately warm. The temperature rose to 81° F. on the 5th and 6th. The lowest temperature was 29° F. on the 13th. The last spring frost occurred on the 14th, when the temperature was 31° F. The spring was still very late at this date, and continued so throughout the month.

June was moderately warm. The highest temperature was 84° F. on the 13th, but there was no long spell of hot weather. There was a heavy rainfall of 6·16 inches of rain in June, of which 3·14 inches fell in five and one-half hours on the 28th. On June 6 notes were made that blooming of trees and shrubs was still much later than the average, that apple trees were still in full bloom; that lilacs were in full bloom; and that Darwin tulips were about at their best.

July was a rather warm month, the temperature being above 80° F. on ten days, the highest being 88° F. on the 8th. There were 4·84 inches of rain during the month. A very severe windstorm or hurricane on the early evening of the 9th uprooted and broke down many trees on the Experimental Farm and in the city.

August was also rather warm with the temperature 80° F. and above on fifteen days. The highest was 88° F. on the 16th. There was a good rainfall in this month also, the precipitation being 4·08 inches.

The month of September was moderately warm to cool with the nights rather cool, not favourable to the ripening of grapes. The highest temperature was 76° F. on the 8th, and the lowest 29° F. on the 29th, when the first autumn frost occurred. There was again a good precipitation of 4·35 inches rain during September.

October was a cool month with the exception of a few days. The highest temperature was 78° F. on the 12th, and the lowest 18° F. on the 30th. The first really killing frost of the autumn was on the 8th, when it was 28° F. Before this, many of the flowers were still in good bloom, and it was really not until the 30th that a still heavier frost closed the season of bloom. There was a rainfall this month of 5·89 inches, there being many rains during the month.

The autumn continued relatively open during November, which was a mild month on the whole, the temperature rising above freezing on twenty-three days. The highest temperature was 63° F. on the 15th, and the lowest 11° F. on the 26th. There were snow flurries during the 20th and a snowstorm on the night of the 21st-22nd. Winter may be said to have set in on the 23rd. The average date for winter setting in for the past thirty-one years is November 26.

December was a mild month. It was below zero twice only during the month, namely, on the 9th and 10th, when it was –12° F. and –15° F. respectively. It was above freezing on fifteen days, the highest being 40° F. on Christmas Day. By the end of the month there was very little snow, the land being bare in places.

POMOLOGY

The season of 1928 was a fairly good one for most fruits at Ottawa. While the spring was late, conditions became better as the season advanced. Small fruits were good, and apples, while only a medium crop, were of good quality. Plums, however, were poor on the whole, the wet autumn making conditions unfavourable for this fruit. Grapes, again, did not ripen well, the late spring and relatively cool summer and autumn being against this.

A new field of some thirty acres was made available for experimental work with fruits and vegetables, and a large part of this was utilized for new plantations. To offset this, between eight and nine acres of land west of the poultry buildings, planted to fruit trees and bushes, was given over to the Poultry Division.

SOME OF THE BEST VARIETIES OF APPLES OF NORTHERN SPY PARENTAGE ORIGINATED IN THE HORTICULTURAL DIVISION, OTTAWA

The Northern Spy, like the McIntosh, has proven to be a good parent in the breeding work in the Horticultural Division, Ottawa, and a number of the trees with Northern Spy as one parent have been so promising for some part of Canada that they have been named from time to time. After several years of fruiting the following varieties are considered the best. The season at Ottawa is a little too short for some of these to reach perfection there, but it is believed they will find a place where the growing season is longer. Most of those described below have a distinct Northern Spy-like flavour. Some of them bear much younger than Northern Spy, and it is hoped that those which were a long time in coming into fruiting as seedling trees will fruit much sooner as grafted trees. This has turned out to be the case already in some instances. It is believed that the trees of most of these are hardier than Northern Spy. These varieties give apples of the Northern Spy type from September until May.

ASCOT

The Ascot apple is an open pollinated seedling of the Northern Spy. Seed of the Northern Spy was saved in the Horticultural Division of the Central Experimental Farm, Ottawa, in 1898, and sown there in the autumn of that year. The seed germinated in the following spring, and the young trees were set out in the orchard in the spring of 1903. One of these trees fruited for the first time in 1912, and a description of it, under the name of Ascot, was published in the Annual Report, 1913, page 222.

Following is a detailed description of the fruit:—

Ascot.—Size above medium to large; form oblate conic to roundish, slightly ribbed; cavity deep to medium depth and width, russeted; stem medium length to long, slender to moderately stout; basin deep, narrow to medium width, abrupt, smooth; calyx closed or open; colour yellow well washed with crimson; predominant colour crimson; seeds medium size to above, acute; dots obscure or few, white, distinct; bloom thin, bluish; skin moderately thick, moderately tough; flavour subacid, pleasant, good; core medium, open; flesh yellowish with traces of red, crisp, tender, juicy; quality good; season November to mid-February or later.

A good dessert apple. Resembles Northern Spy a little in outward appearance, particularly in colour and about the basin, and considerably in flesh and flavour.

BINGO

The Bingo apple is an open pollinated seedling of the Northern Spy. It originated in the Horticultural Division, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in the spring of 1902. One of these trees fruited for the first time in 1910, and a description of it, under the name of Bingo, was published in the Annual Report, 1911, page 110.

Following is a detailed description of the fruit:—

Bingo.—Size above medium to large; form roundish conical to oblate conic; cavity deep, narrow to medium, russeted; stem short to medium, stout; basin narrow to medium width, abrupt, deep, slightly wrinkled; calyx partly open; colour pale greenish yellow washed and splashed with crimson with darker splashes; predominant colour crimson; seeds medium size, acute to acuminate; dots few, white, distinct; skin thick, tough; flesh yellowish with traces of red, tender, moderately juicy, rather coarse; core small; flavour subacid, sprightly, spicy, pleasant; quality good; season December to late winter.

Resembles Northern Spy considerably in outward appearance, flesh, and flavour, but not quite juicy enough.

CURRIE

The Currie apple is an open pollinated seedling of the Northern Spy. Seed of the Northern Spy was saved and sown in the Horticultural Division, Central Experimental Farm, Ottawa, in the autumn of 1903. It germinated in the following spring and the young trees were set out in the orchard in 1906. The tree, afterwards named Currie, fruited for the first time in 1916, and a description of it, under that name, was given in the Annual Report, 1920-21, page 5.

Following is a detailed description of the fruit:—

Currie.—Size large; form roundish conical to oblong conical; cavity deep, open; stem medium length, moderately stout; basin medium depth to deep, open, wrinkled; calyx open; colour yellow, thinly washed and splashed with carmine approaching orange red; predominant colour carmine approaching orange red; seeds above medium, broad, acuminate and obtuse; dots few, white, distinct; skin moderately thick, moderately tender; flesh yellowish, tender, melting, moderately juicy; core medium; flavour subacid, pleasant, spicy; quality good; season October to January or later.

A nice dessert apple. Has a slight resemblance to Northern Spy in colour of skin and shape, and is suggestive of Sops of Wine in flavour. Not quite as good as Galton.

ELMER

The Elmer apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved, and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Elmer, fruited for the first time in 1911, and a description of it, under that name, was published in the Annual Report, 1912, page 92.

Following is a detailed description of the fruit:—

Elmer.—Size, medium; form roundish, slightly ribbed; cavity deep, narrow, russeted at base; stem slender to moderately stout, medium length to long; basin deep, medium width, slightly wrinkled; calyx partly open or open; colour

greenish yellow well washed and splashed with deep rather dull crimson; predominant colour deep crimson; seeds medium size, acute; dots obscure; bloom pinkish, medium; skin moderately thick, moderately tough; flesh yellowish, crisp, tender, juicy; core medium size, open; flavour subacid, pleasant, sprightly; quality good; season January to late winter.

Looks and tastes considerably like Northern Spy. Flesh is much like Spy. Not quite large enough for best market size, but a good dessert apple.

EMILIA

The Emilia apple is an open pollinated seedling of Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Emilia, fruited for the first time in 1914, and a description of it, under that name, was published in the Annual Report, 1915, page 595.

Following is a detailed description of the fruit:—

Emilia.—Size medium to above medium; form roundish conical; cavity deep, medium width, russeted; stem medium to short, stout to moderately stout; basin medium to deep, medium width, wrinkled; calyx partly open or closed; colour greenish yellow washed and splashed with crimson; predominant colour crimson; seeds medium size, acute; dots moderately numerous, white, distinct; skin thick, moderately tough; flesh dull white, crisp, juicy, tender; core medium size to small; flavour briskly subacid, pleasant; quality good to very good; season December probably to April..

One of the best of the Northern Spy seedlings. Thought to be almost equal to Spy in quality. Resembles Northern Spy very much in colour of skin, shape, flesh, and flavour, but original tree was so long in coming into bearing that it remains to be seen if grafted trees will bear sooner than Northern Spy.

GALTON

The Galton apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1903. It germinated in the following spring, and the young trees were set out in the orchard in 1906. The tree, afterwards named Galton, fruited for the first time in 1912, and a description of it, under that name, was published in the Annual Report, 1915, page 595.

Following is a detailed description of the fruit:—

Galton.—Size above medium; form oblate to roundish, slightly ribbed; cavity deep, medium width; stem medium length, slender to moderately stout; basin deep, abrupt, medium width, almost smooth; calyx closed or partly open; colour yellow washed with deep orange red approaching crimson; predominant colour deep orange red approaching crimson; seeds medium size, broad, obtuse and acute; dots few, pale yellow, distinct; skin moderately thick, tough; flesh yellowish, sometimes with traces of red near basin, crisp, tender, juicy; core medium size, open; flavour subacid, aromatic, spicy, pleasant; quality good to very good; season late September to late December.

Attractive in appearance. No marked resemblance to Northern Spy. Colour of skin and flavour somewhat like Sops of Wine. A good autumn variety.

GLENTON

The Glenton apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved, and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Glenton, fruited for the first time in 1909, and a description of it, under that name, was published in the Annual Report, 1911, page 111.

Following is a detailed description of the fruit:—

Glenton.—Size above medium to large; form roundish to oblate conic, ribbed; cavity deep, open, russeted at base; stem medium length to short, stout to moderately stout; basin deep, medium width, wrinkled; calyx closed; colour yellow well washed, almost covered, with deep rather dull crimson; predominant colour deep rather dull crimson; seeds medium, acute; dots small, moderately numerous, pale yellow, distinct; skin moderately thick, moderately tender, somewhat oily; flesh yellowish with traces of red, a little coarse, tender, moderately juicy; core medium, somewhat open; flavour subacid, pleasant; quality good; season October to late November.

Resembles Northern Spy a little in outward appearance, character of flesh, and flavour, but flavour is more like Sops of Wine.

LIPTON

The Lipton apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Lipton, fruited for the first time in 1914, and a description of it, under that name, was published in the Annual Report 1915, page 595.

Following is a detailed description of the fruit:—

Lipton.—Size medium; form roundish to oblate conical, ribbed; cavity deep, open, russeted; stem short to medium stout to moderately stout; basin deep, medium width, wrinkled; calyx partly open or open, sometimes closed; colour yellow well washed and splashed with crimson; predominant colour crimson; seeds medium size, acute; dots moderately numerous, yellow, distinct; skin moderately thick, moderately tough; flesh yellow with traces of red, crisp, tender, juicy; core medium; flavour subacid, pleasant; quality good; season late September probably to February.

Outward appearance, flesh and flavour much like Northern Spy.

NESTOR

The Nestor apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1904. The tree, afterwards named Nestor, fruited for the first time in 1912, and a description of it, under that name, was published in the Annual Report, 1912, page 93.

Following is a detailed description of the fruit:—

Nestor.—Size medium to large; form roundish conic, slightly ribbed; cavity deep, open, heavily russeted; stem medium length, moderately stout, basin deep, open, wrinkled; calyx open or partly open; colour yellow washed and

splashed with crimson; predominant colour crimson; seeds above medium, acuminate; dots obscure or few, yellow and distinct; skin moderately thick, tender; flesh, yellowish, crisp, tender, juicy; core small, open; flavour briskly subacid, pleasant; quality good; season November to January or later.

Resembles Northern Spy considerably in outward appearance, flesh, and flavour.

NIOBE

The Niobe apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Niobe, fruited for the first time in 1909, and a description of it, under that name, was published in the Annual Report, 1911, page 111.

Following is a detailed description of the fruit:—

Niobe.—Size above medium; form roundish, regular or slightly ribbed, conical; cavity deep, medium width; stem medium to long, slender to moderately stout; basin deep, medium width, smooth to slightly wrinkled; calyx partly open; colour greenish yellow washed and splashed with rather dull crimson; predominant colour rather dull crimson; seeds above medium, acuminate; dots few, white, indistinct; bloom thin, pinkish; skin moderately thick, tough; flesh yellowish, crisp, tender, melting, rather coarse, moderately juicy; core medium, open; flavour mildly subacid, pleasant, sprightly; quality good to very good; season December to late winter.

Resembles Northern Spy a little in outward appearance and the Delicious in flavour. Requires a rather long season for best development of colour.

ROSALIE

The Rosalie apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1901. The tree, afterwards named Rosalie, fruited for the first time in 1908, and a description of it, under that name, was published in the Annual Report, 1911, page 112.

Following is a detailed description of the fruit:—

Rosalie.—Size above medium to large; form roundish to oblate, slightly ribbed; cavity very deep, open, russeted; stem short to medium length, moderately stout to stout; basin deep, abrupt, medium width, wrinkled; calyx closed; colour yellow thinly splashed and washed with dull carmine; predominant colour dull carmine; seeds above medium size, acute to acuminate, many seeds; dots obscure; bloom thin, pinkish; skin moderately thick, tender; flesh, white, crisp, tender, juicy to moderately juicy; core medium size, open; flavour subacid, sprightly, pleasant, spicy; quality good; season late November to late February.

Somewhat like Northern Spy in character of flesh and flavour, but not in outward appearance. Not quite high enough in colour.

SANDOW

The Sandow apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the

orchard in 1902. The tree, afterwards named Sandow, fruited for the first time in 1911, and a description of it, under that name, was published in the Annual Report, 1912, page 94.

Following is a detailed description of the fruit:—

Sandow.—Size above medium; form roundish, ribbed; cavity deep, open; stem short to medium, slender to moderately stout; basin deep, medium width, nearly smooth; calyx closed; colour yellow well washed with deep crimson; predominant colour deep crimson, somewhat dull; seeds medium size, acute; dots very few, small, white, distinct; skin moderately thick, tender; flesh yellowish, crisp, tender, juicy; core medium size, open; flavour pleasant, sprightly, Spy-like; quality good; season December to late winter.

A good dessert apple. Resembles Northern Spy somewhat in outward appearance and in character of flesh and flavour. Is particularly promising as a winter apple for New Brunswick.

SPARTA

The Sparta apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1901. The tree, afterwards named Sparta, fruited for the first time in 1912, and a description of it, under that name, was published in the Annual Report, 1914, page 495.

Following is a detailed description of the fruit:—

Sparta.—Size medium to large; form roundish; cavity open, deep, russeted; stem short to medium, moderately stout; basin deep, open, nearly smooth; calyx open; colour greenish yellow washed and splashed with crimson; predominant colour crimson; seeds medium size, acute; dots very few, white, indistinct; skin moderately thick, tender; flesh yellowish, crisp, juicy; core medium, open; flavour briskly subacid, pleasant; quality good; season December to late winter.

A good dessert apple. Resembles Northern Spy somewhat in flesh and flavour.

SPIANA

The Spiana apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa. Ont. Seed of the Northern Spy was saved and sown in the autumn of 1900. It germinated in the following spring, and the young trees were set out in the orchard in 1903. The tree, afterwards named Spiana, fruited for the first time in 1919, and a description of it, under that name, was published in the Annual Report, 1925, page 8. This tree was a long time coming into bearing.

Following is a detailed description of the fruit:—

Spiana.—Size above medium to large; form roundish to oblate, slightly ribbed; cavity deep, open, russeted; stem short to medium, stout; basin deep, open, slightly wrinkled; calyx open; colour greenish yellow washed and splashed with deep orange red approaching crimson; predominant colour deep orange red; seeds below medium to small size, acute; dots moderately numerous, pale yellow, indistinct; skin moderately thick, tender; flesh dull white or yellowish, firm, crisp, tender, juicy; core medium size, open; flavour subacid, sprightly, pleasant, not high; quality good; season December to April.

A good dessert apple. Attractive in appearance. Colour of skin, character of flesh, and flavour considerably like Northern Spy.

SPIKEE

The Spikee apple is a cross between Northern Spy and Milwaukee, made in the Horticultural Division, Central Experimental Farm, Ottawa, in 1904, the seed being sown in the autumn of that year. The young trees from this cross were planted in the orchard in 1907, and the tree, which was afterwards named Spikee, fruited for the first time in 1920, and a description of it was published, under that name, in the Annual Report, 1926, page 7.

Following is a detailed description of the fruit:—

Spikee.—Size large; form oblate to roundish, regular; cavity deep, medium width to open, russeted; stem short to medium, stout; basin open, medium depth, nearly smooth; calyx open; colour greenish yellow washed with dull red; predominant colour dull red or 50 per cent of each; seeds medium size to below, acute and acuminate; dots obscure; skin moderately thick, tender; flesh yellow, crisp, tender, juicy; core medium; flavour mildly subacid, pleasant; quality good; season probably November to late February.

A nice dessert apple, though not as attractive in appearance as some others. No marked resemblance to either parent.

SPIMORE

The Spimore apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1901. It germinated in the following spring, and the young trees were set out in the orchard in 1904. The tree, afterwards named Spimore, fruited for the first time in 1915, and a description of it, under that name, was published in the Annual Report, 1923, page 5.

Following is a detailed description of the fruit:—

Spimore.—Size above medium to medium; form oblate conic; cavity medium width, deep; stem short, slender to moderately stout; basin deep, open, wrinkled; calyx open; colour pale yellow washed with rather dull crimson; predominant colour rather dull crimson; seeds medium size, acute; dots moderately numerous, brownish or yellow, distinct; skin moderately thick, moderately tender; flesh yellowish with traces of red, crisp, juicy; core medium size to small, open; flavour briskly subacid, sprightly, pleasant; quality good; season December probably to March.

Resembles Northern Spy considerably in flesh and flavour. Not quite sufficiently attractive in appearance.

SPIRETTA

The Spiretta apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1899. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Spiretta, fruited for the first time in 1916, and a description of it, under that name, was published in the Annual Report, 1923, page 5.

Following is a detailed description of the fruit:—

Spiretta.—Size above medium to medium; form oblate to roundish conic, almost regular; cavity deep, open, russeted; stem short to medium, moderately stout to stout; basin deep, medium width to open, abrupt, nearly smooth; calyx partly open; colour pale greenish yellow well washed and splashed with crimson; predominant colour crimson; seeds medium size, acute; dots few, white, distinct;

Bloom medium, bluish; skin moderately thick, tough; flesh dull white, firm, crisp, moderately juicy to juicy; core small; flavour subacid, pleasant; quality good; season probably late December to April.

A good dessert apple. Resembles Northern Spy considerably in colour of skin and in flavour.

SPIRO

The Spiro apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1901. It germinated in the following spring, and the young trees were set out in the orchard in 1904. The tree, afterwards named Spiro, fruited for the first time in 1914, and a description of it, under that name, was published in the Annual Report, 1920-21, page 6.

Following is a detailed description of the fruit:—

Spiro.—Size medium; form oblate to roundish; cavity deep, medium width, russeted; stem short to medium, moderately stout to slender; basin deep, abrupt, medium width to open, slightly wrinkled; calyx open; colour greenish yellow well washed and splashed with deep crimson; predominant colour deep crimson; seeds medium size, acute; dots few, yellow, distinct; skin thick, tough; flesh yellowish, crisp, tender, juicy; core medium size, open; flavour subacid, sprightly, pleasant; quality good; season November probably to March or later.

Resembles Northern Spy considerably in flesh and flavour.

SPIWELL

The Spiwell apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1902. The tree, afterwards named Spiwell, fruited for the first time in 1921, and a description of it, under that name, was published in the Annual Report, 1927, page 12. The original tree was injured in the winter of 1917-18, which accounts, in part, for its being so late in coming into bearing.

Following is a detailed description of the fruit:—

Spiwell.—Size above medium; form oblate to roundish; cavity deep, open; stem short to medium, stout; basin deep, medium width, abrupt, smooth; calyx open or closed; colour yellow washed and splashed with carmine; predominant colour carmine; seeds medium size, acute; dots moderately numerous, pale yellow, distinct; skin moderately thick, tough; flesh dull white, crisp, tender, juicy; core medium to small, open; flavour subacid, pleasant; quality good; season probably November to January or later.

Attractive in appearance. Resembles Northern Spy very much in outward appearance, in flavour, and somewhat in character of flesh.

SPIZA

The Spiza apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1903. It germinated in the following spring, and the young trees were set out in the orchard in 1906. The tree, afterwards named Spiza, fruited for the first time in 1916, and a description of it, under that name, was published in the Annual Report, 1922, page 8.

Following is a detailed description of the fruit:—

Spiza.—Size medium to large; form roundish; cavity narrow, deep, russeted; stem medium length, moderately stout to slender; basin deep, narrow to medium

width, abrupt, wrinkled; calyx partly open; colour pale greenish yellow thinly washed and splashed with carmine approaching crimson; predominant colour carmine approaching crimson; seeds above medium, acute; dots obscure or few, yellow, distinct; skin moderately thick, moderately tough; flesh yellowish, crisp, tender, juicy; core above medium size, open; flavour briskly subacid, not high but pleasant; quality good; season November to March.

Flesh considerably like Northern Spy. Flavour a little like Northern Spy. Shape and colour considerably like Northern Spy.

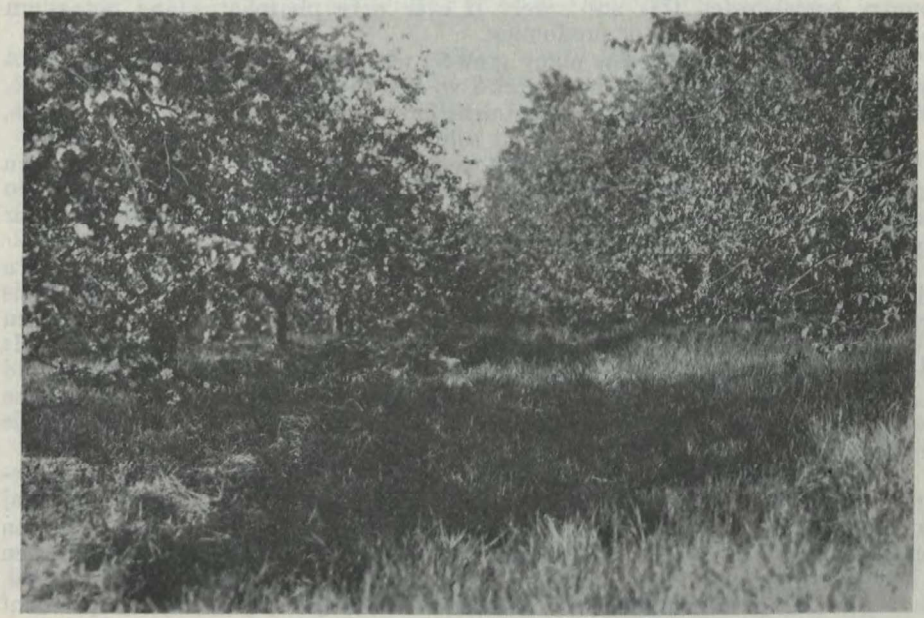
THURSO

The Thurso apple is an open pollinated seedling of the Northern Spy. It originated in the Division of Horticulture, Central Experimental Farm, Ottawa, Ont. Seed of the Northern Spy was saved and sown in the autumn of 1898. It germinated in the following spring, and the young trees were set out in the orchard in 1901. The tree, afterwards named Thurso, fruited for the first time in 1909, and a description of it, under that name, was published in the Annual Report, 1908, page 103:—

Following is a detailed description of the fruit:—

Thurso.—Size medium to above medium; form roundish to oblate, slightly angular; cavity medium depth and width to deep, russeted; stem medium length, slender to moderately stout; basin medium depth and width to deep, nearly smooth; calyx closed or partly open; colour pale greenish yellow washed and splashed with attractive red or crimson; predominant colour crimson; dots few, small, pale, indistinct; seeds below medium, acute; bloom thin, bluish; skin thick, tough; flesh yellowish with traces of red, firm, crisp, juicy; core above medium, open; flavour subacid, sprightly, pleasant; quality good; season October to late December.

Looks, tastes, and smells somewhat like Northern Spy.



Apple orchard at Abbotsford, Que., in which sod mulch experiments are in progress.

FERTILIZERS FOR APPLE ORCHARDS

The question of fertilizers for apple orchards has been receiving considerable attention in the Horticultural Division during the past five years. An attempt has been made to approach the problem from two angles, first from a study of the behaviour of apple trees and other plants in pure sand cultures under control conditions of nutrition, and, secondly, from a study of the behaviour of trees under field conditions when grown under different fertilizer treatments. From the first we have obtained information of a fundamental nature, from the second, information as to the practical value of the application of these fundamentals to field conditions.

As this article is intended for the grower it would seem advisable to review the fertilizer situation generally and to approach the question with a clear understanding of the limitations of experimental results.

A brief survey of fertilizer recommendations and treatments generally given to orchards prior to 1914 reveals the fact that either manure was used or that complete fertilizers, containing about four per cent nitrogen, eight per cent phosphoric acid and four per cent potash, were largely used. Variations from these were either in the form of basic slag alone or a combination of some phosphatic fertilizer and a potassic fertilizer. Rarely, if ever, were nitrogenous fertilizers used in larger amounts or even alone. Such practice must have resulted in the comparative accumulation of the mineral elements of the soil and the comparative depletion of the available nitrogen. This was a general condition, with variation of course among individual orchards. In addition, in many orchards which had never been fed, nitrogen was of course also in deficiency and probably the most limiting factor. During the war, potash becoming unavailable, growers learned that they could get along for a time without this element of plant food. Then about 1919 there began the general use of nitrogen only, applied to orchards in early spring. The practical results were, of course, almost miraculous and there became a widespread belief that nitrogen was the only element of plant food necessary for orchard purposes. Experimental results from all over the country corroborated this and rarely if ever were phosphorus and potassium found to increase growth or production.

During the last few years many growers who formerly had derived excellent results from nitrogen alone have failed to get the same measure of response. Whether this is due to fertilizer treatment only or to other factors is, of course, a debatable question difficult of final solution.

Briefly, the situation prior to 1914, in most orchards, was deficient nitrogen and comparative excess of mineral elements. After 1920 the situation changed to satisfactory nitrogen conditions with increasing accumulation of nitrogen year by year and a gradual decrease of mineral elements.

We are now in a position to discuss and appreciate the significance of a piece of work performed in this division and reported in its 1927 report. This work with strawberries in sand cultures showed briefly that a balance between nitrogen and the mineral elements was very essential in plant nutrition. It showed further that, while excess minerals up to a very high concentration did not result in any increase in yield, it did not produce any ill effects. On the other hand slight excess of nitrogen resulted in reduced yields and noticeable injury.

The value of maintaining the available mineral supply is, therefore, important and as the nitrogen content of the soil increases so should the mineral content increase. This points to the possibility of overdoing the nitrogen applications when made alone. Just how long it is possibile to apply nitrogen alone to an orchard depends upon (1) the rate of application, (2) the soil, and (3) the past treatment of the soil. No single experiment or piece of research can answer this question, but it can be pointed out that there is a

danger of overdoing the continuous use of nitrogen only. It should be further borne in mind that the more nitrogen applied the greater the drain on the mineral resources of the soil. Every pound of nitrogen used in plant nutrition requires a certain amount of phosphorus, potash and other minerals.

As pointed out earlier in this article few experiments during the last decade have shown results from phosphorus and potash, but very recently some evidence seems to be filtering through here and there to show slight benefits from phosphorus at least.

This division has been conducting some field experiments at Abbotsford, P.Q., on a sod mulch orchard of mature trees which, previous to our treatment, had not received much in the way of fertilizers.

While it is yet too early to judge by the results of yields, growth results and girth increases serve as a good indicator of the response of the trees to the different treatments. To date there has been a distinct increase in girth on the plots receiving all three elements of plant food, as compared with those receiving nitrogen only. As girth increase has been shown to be indicative of and closely linked with the ultimate bearing possibilities of the tree, these complete fertilizer plots should eventually distinctly outyield the nitrogen-only plots.

In addition to the sand culture work with strawberries and the field work with apples, we have grown apple trees in different solutions under sand cultures for a number of years and from all this work have derived the following formula for an orchard fertilizer, which we feel meets the needs more fully than either the old 4-8-4 mixture or the single element policy. This mixture consists as follows: 4 pounds nitrate of soda, or the equivalent, 2 pounds acid phosphate or its equivalent, and 1 pound muriate of potash or its equivalent. This works out to about a 9-5-7 mixture. The rate of application would depend upon the age of the tree, but for fully grown trees, planted not more than sixty to the acre, about eight to ten pounds of the above mixture per tree should prove sufficient. Smaller trees or closer planting would have to be handled in proportion to the above.

THE GRASS MULCH SYSTEM OF ORCHARDING

There has been considerable interest shown this past year in the success which has attended our demonstration orchard at Abbotsford, on which a grass mulch has been used. A short article on the merits of the grass mulch and its application would seem timely.

This system of orchard management appears adapted to most of the orchard sections of Eastern Canada. It offers a somewhat cheaper method of maintenance than the clean cultivation and cover crop system and is particularly superior on stony or rough land. It also provides a good system for the development of fruit colour and when sufficient mulch is provided this method appears quite equal, if not superior, to the dust mulch or clean cultivation for moisture control.

It is lacking in one essential, namely, nitrate nitrogen when compared with the clean cultivation system. This latter system offers an opportunity for the warming up and the aeration of the soil in early spring, with a resultant rapid increase in the nitrate nitrogen content of the soil. This particular form of nitrogen is especially valuable for fruit trees so that to overcome this deficiency on the part of the grass mulch it is imperative that quickly available forms of nitrogen be supplied, such as nitrate of soda or sulphate of ammonia.

The grass mulch system must not be confused with the sod orchard where no attempt is made to control moisture by maintaining a proper mulch. Orchards now in sod can be quickly changed over to the mulch system by the simple addition of old hay, straw, or similar material, at the rate of about 100 pounds per

tree, spread out as far as the drip of the branches. It will probably be necessary to repeat this mulch application for two or three years, after which the grass cuttings from between the rows should be sufficient to maintain a satisfactory mulch, with possibly occasional additions of foreign material. The space between the rows of trees beyond the drip of the branches may be left in sod and cut two or three times during the growing season, the cuttings being raked up and thrown under the trees. In this way mulch maintenance is considerably cheapened without any apparent loss in efficiency. The importance of maintaining a proper mulch has been amply demonstrated at our Abbotsford orchard, where there has been a distinct difference in favour of the mulched area as compared with the sod. The trees in the mulch area have been swung from biennial to annual bearing, while the trees under sod are still producing crops only every other year. Foliage, colour and size of fruit are far superior on the mulch area than on the non-mulch area.

TIME OF NITROGEN APPLICATION TO APPLE TREES

Project H-588B

Although it has been the general practice to advocate the application of nitrogenous fertilizer early in the spring, when soil nitrification and nitrates in the soil are low, the recommendation has been based more on theory than on conclusive evidence that this is the optimum time. It may be possible to send a tree into winter with enough stored food, including proteins, to carry it through this critical period.

Nitrogenous fertilizers applied early in the spring are, of necessity, of a quickly available form and if not taken up by the tree considerable quantities leach away. It is doubtful whether the tree is able at this particular stage to make use of quantities greater than required for its immediate use. It is at this period drawing upon its reserves of stored food and it would be reasonable to consider that there does not exist a surplus of uncombined carbohydrates with which a surplus of nitrates might combine to form stored proteins later to be employed for promoting growth.

Since fruit buds for the succeeding year's crop are initiated early in the summer it is essential that rapid growth be promoted at this time to provide for the accumulation of carbohydrates. We must also consider that late applications of nitrogen might keep the trees growing too late, which, apart from winter injury, might result in a low accumulation of food including proteins.

The following series of applications were employed with stock trees in pot sand cultures in order to secure some evidence along these lines:—

Series I received a full nutrient solution throughout the entire season.

Series II received a full nutrient solution from the opening of spring until blossoms were in the pink (May 28). The pots were thoroughly washed through until no trace of nitrogen existed in the wash water and from then on were fed only with solution minus nitrogen.

Series III received full nutrient solution from the opening of spring until the trees were in full bloom (June 4), then were treated as in Series II.

Series IV received full nutrient solution until the calyx closed (June 13), then were treated as in Series II.

Series V received full nutrient solution until July 15, then were treated as in Series II.

Series VI received full nutrient solution until September 1, then were treated as in Series II.

In addition to the above, there was a contemporary series in which nitrogen was limited in the earlier part of the season.

In Series VII nitrogen was left out of the nutrient solution until the blossoms were in the pink stage (May 28), then supplied for the balance of the season.

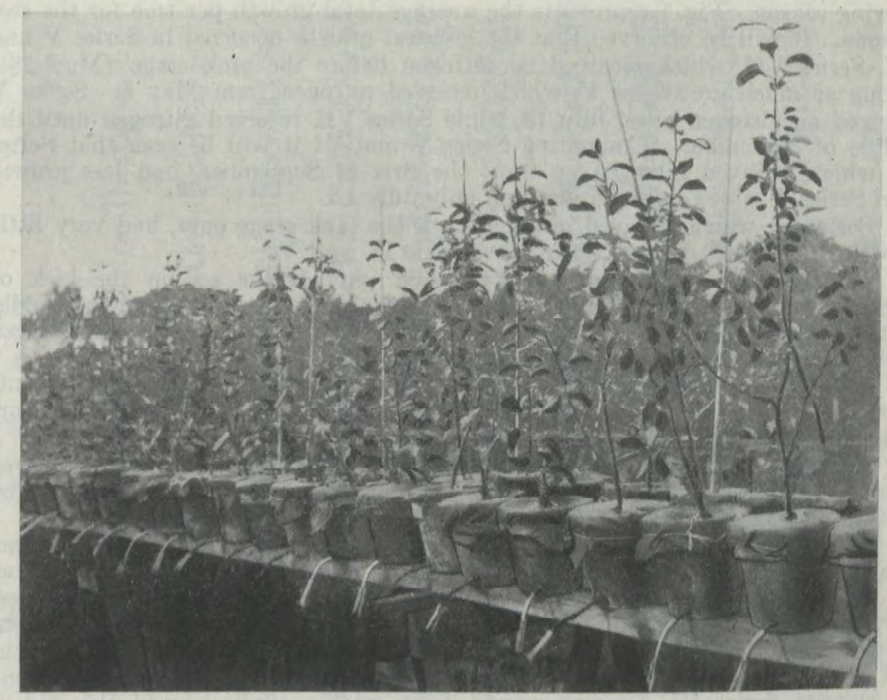
In Series VIII nitrogen was left out of the nutrient solution until full bloom (June 4), then supplied for the balance of the season.

In Series IX nitrogen was left out of the nutrient solution until the calyx closed (June 13), then supplied for the balance of the season.

In Series X nitrogen was left out of the nutrient solution until July 15, then supplied for the balance of the season.

In Series XI nitrogen was left out of the nutrient solution until September 1, then supplied for the balance of the season.

The trees employed for this experiment were Doucin and broad-leaf Paradise stock obtained from East Malling Research Station, Kent, England. The trees were potted in ground sandstone in 8-inch pots. The pots were dipped in paraffin and each pot was fitted with a tarpaulin cover to check drying out and also to keep out rain, etc. Provision was made for draining and leaching out of the pots by the insertion of a tube in the side of the pot close to the bottom, to which a suction pump could be attached. An attempt was made to keep the moisture content uniform by the application of solution. No attempt was made to supply the same quantity of solution to each pot, it being considered that by keeping the moisture content uniform the salt concentration inside the pot would also be uniform.



Some of the pots in the nutrition studies, Horticultural Division, Central Experimental Farm, Ottawa.

Solution Formulae

A three-salt solution was employed. Stock solutions were made up as follows:—

135·07 grams of monopotassium phosphate in 1000 cc. of water.
119·42 grams of magnesium sulphate in 1000 cc. of water.
163·6 grams of calcium nitrate in 1000 cc. of water.
73·8 grams of calcium hydroxide in 1000 cc. of water.

Full Nutrient Solution

Amount of stock solution employed in 1000 cc. of water:—

Monopotassium phosphate=7·14 cc.
Magnesium sulphate=5·00 cc.
Calcium nitrate=18·30 cc.

Lacking nitrogen Solution

Amount of stock solution employed in 1000 cc. of water:—

Monopotassium phosphate=7·14 cc.
Magnesium sulphate=5·00 cc.
Calcium hydroxide=18·02 cc.

Growth and Girth Measurements

Growth and girth measurements were taken for two years during the growing season. Fig. 1 represents the average total growth per tree for the two seasons. It will be observed that the greatest growth occurred in Series V and VII, Series VII, which received no nitrogen before the pink stage (May 28), having as much growth as V, which received nitrogen from May 5. Series V received no nitrogen after July 15, while Series VII received nitrogen until the middle of September. Comparing Series V and VI it will be seen that Series VI, which received nitrogen up until the first of September, had less growth than Series V which received nitrogen only July 15.

Series II, which received nitrogen until the pink stage only, had very little growth, the growth increasing in Series III, IV and V.

In the series lacking nitrogen the first part of the season the lack of nitrogen did not make itself felt until after the pink stage, the growth rapidly decreasing in Series VIII, IX and X. Series XI, which received no nitrogen until September 1, showed the lowest total growth.

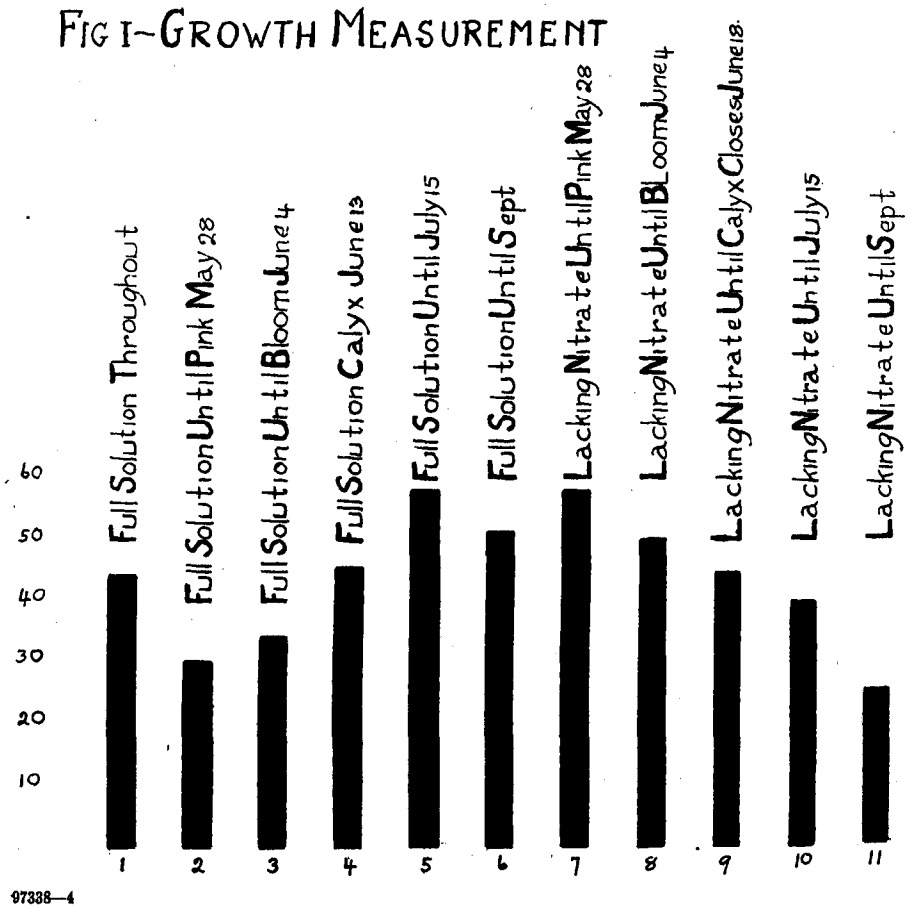
Somewhat similar comparisons may be drawn from girth measurements as shown in Fig. II, except that the lacking of nitrogen in the spring appears to have had no deleterious effect until a somewhat later period.

In taking growth measurements throughout the season it was observed that the greatest growth occurred at different periods in the different series, acccording to the treatment they were receiving.

In Series I the growth was steady throughout. In Series II growth practically ceased the middle of July; Series III, growth decreased from the end of July, with some growth until the end of August; Series IV, the greatest growth took place from the middle of June to the middle of July, with some growth from then until the end of August; Series V, steady growth until the end of August; Series VI, steady growth from middle of June until the end of August; Series VII, steady growth from middle of June until the end of August; Series VIII, growth continued strong from the middle of June until

the middle of August; Series IX, greatest amount of growth from the middle of July to the middle of August; Series X, very little growth from the middle of June until the middle of July, increasing from then until September; Series XI, growth slow throughout.

General observations on vigour, colour of foliage, etc., bore out the results obtained from growth measurements. Throughout the season Series II evidenced nitrogen starvation by a yellowing or yellow bronzing of the leaves and an evident lack of vigour. Leaves dropped early in the autumn; terminal buds formed early. Series III, IV and V, while exhibiting these symptons to some extent, were somewhat more vigorous, with better coloured foliage. Series VI, VII, VIII and IX possessed good coloured foliage with good vigour throughout the season; trees held their leaves longer and terminal buds not formed as soon as previous series. During the second season Series X exhibited good healthy appearance until about the beginning of August, when the foliage began to assume a somewhat yellowish appearance indicative of nitrogen starvation. Series XI showed signs of nitrogen starvation throughout. Foliage was of a light green colour, growth slender, terminal buds formed early. After the application of nitrogen in September the foliage somewhat improved in colour, but no new growth was made.



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Summary

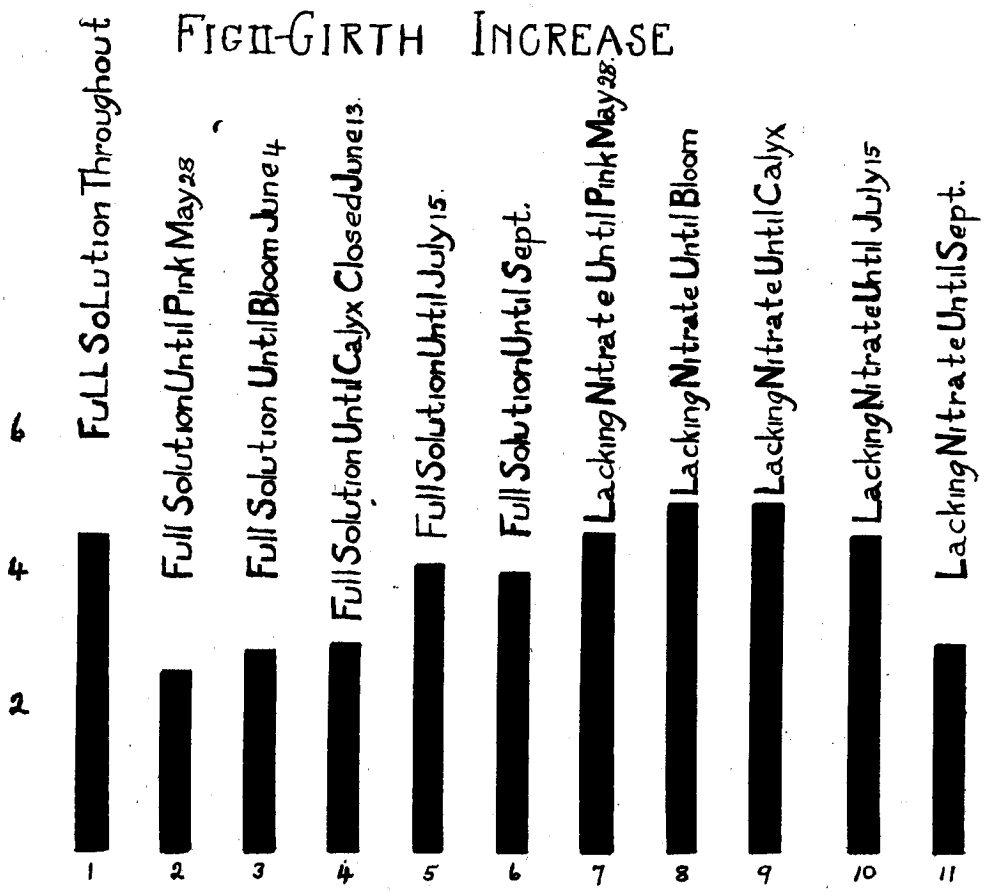
As this is but a progress report we make no attempt to draw any conclusions from the reported evidence. The measurements tabulated merely indicate:—

(1) That very early applications of nitrogen in the spring, before the pink stage, exercise very little influence in promoting growth.

(2) The critical period for the application of nitrogen for promoting maximum growth appears to be from about the middle of June to the middle of July.

3. Applications of nitrogen after September 1 have little effect in promoting growth.

(4) The time that growth occurs during the season coincides with the time of application of nitrogen.



VALUE OF DIFFERENT STRAWBERRY VARIETIES AS PARENTS

During the past ten years a large number of different varieties of strawberries have been used as parents in the hybridizing work. The results from thirty-seven of these varieties, involving one hundred and fifty-three combinations, have been analyzed and presented below. This information gives some idea of the value of these varieties as parents. In many cases a combination did not give any progeny which were worthy of trial in the regular test rows. It might be well at this junction to explain briefly the process of analysis in use at this Station.

The young seedlings or hybrids are grown in individual hills and permitted to fruit. An examination is made of them at this time and only those which show some merit are retained; the balance are immediately discarded and thrown away. Those retained are then propagated and grown in fifteen-foot test rows, at which time they are again gone over carefully and further discarding takes place. Those which pass through the second test are then passed on to thirty-foot rows where a still stricter elimination generally results in the great majority getting on the discard list. Those, however, which reach the thirty-foot rows, or, in other words, survive two elimination tests, are really berries of considerable merit and the percentage of progeny which any combination can place in this class is a fair measure of the value of that particular cross as a possible progenitor of future commercial sorts.

Table No. 1 below shows the percentage of progeny from each cross which survived to the thirty-foot test rows, and it is of interest to note the difference in the value of these combinations. The outstanding combinations have been briefly as follows:—

Easy Picker x Wm. Belt.
F. Mexico 55516 x Jessie.
Ettersburg 84 x Jessie.
Portia x Etters 512.
Portia x F. Mexico 54976.
Late Cross selfed.
Jessie x Santiago de Chile.
Nor J. x Parson Beauty .
Delecto x Cassandra.
Euresko x Cassandra.
Nor J. x Cassandra.

On the other hand some very disappointing combinations were obtained. Those which were particularly so, due almost entirely to a large amount of sterility among the progeny are listed below:—

Wm. Belt x Etters 512.
Beaderarena x Wm. Belt.
Portia x Jessie.

TABLE I—PERCENTAGE OF PROGENY FROM EACH CROSS WHICH SURVIVED TO THE THIRTY-FOOT TEST ROWS

—	Bederwood	Burrell	Euresko	Cassandra	Cook	Francesca	Giant	Ettersburg 84	Santiago de Chile	Jucunda	White Sugar	Mele	New Globe	Parson Beauty	Paxton	Nor J.	Pocomoke	Senator Dunlap	South Dakota	Valeria	Ettersburg 86	Euresko	Magoon	Open Pollinated	Ettersburg 512	Delecto	Wm. Belt	Jessie	Mexico 55516	Excelsior	Mexico 54976	Late Cross
Bederwood	0						0			0		0	0				5·5			0												
Bisel						0				0		0	0	0																		
Beaderarena														5·5			0										0	0				
Burrell						0								0				0	0													
F. Mexico 54976																											0					0
Jessie									39·13																			10·3		0		
Easy Picker																											36·5	10·8				
Cook	0									0		0		0			3·6															
F. Mexico 55516																												24·5	7·1			
Francesca	0	0								0			0	0			0	0	0	0												
Giant	0						0					0					0															
Greenville						0				5·3		0		0			0			3·3												
Ettersburg 84				0																							0	33				
Wm. Belt			8·3						13·65		3·8										5·1				0	14·7						
Jucunda												0		2·1																		
Delecto				46·5										2·8													0					
White Sugar											0																9·5	16·7				
Ettersburg														12·5													0					
Mele												0					0															
Santiago de Chile									4·1																		0	13·6				
New Globe	2·1						0			0		0	0	5·5			7·5															
Ettersburg 86				0																	0	7·1			0							
Parson Beauty	0	0			0	25	0	0		0		0		·73	0	0	0	0	0			0			0	0						
Parxton															0																	
Portia	0	0			4·2	0	0		11·73	0		0	0	2·7			0	5·9	0	2·4					19·3			0·86	19·4			100
Pocomoke													0																			
Cassandra																					0	7·1			0							
Senator Dunlap																			0													
South Dakota		0				0								0				0														
Late Cross																											2·9	0				29·4
Valeria										0		0	0	0			5·			1·7												
Ettersburg 512				5·3																					0			0				
Nor J				16·7										29·2													2·6	16·7				
Excelsior																												10·4				
Willard									14·8												0		6·9							3·6		
Magoon																						0										
Euresko			0	0																							21·7	0				

NITROGEN, PHOSPHORUS AND POTASH STARVATION AT DIFFERENT STAGES OF THE GROWTH OF FRAGARIA.

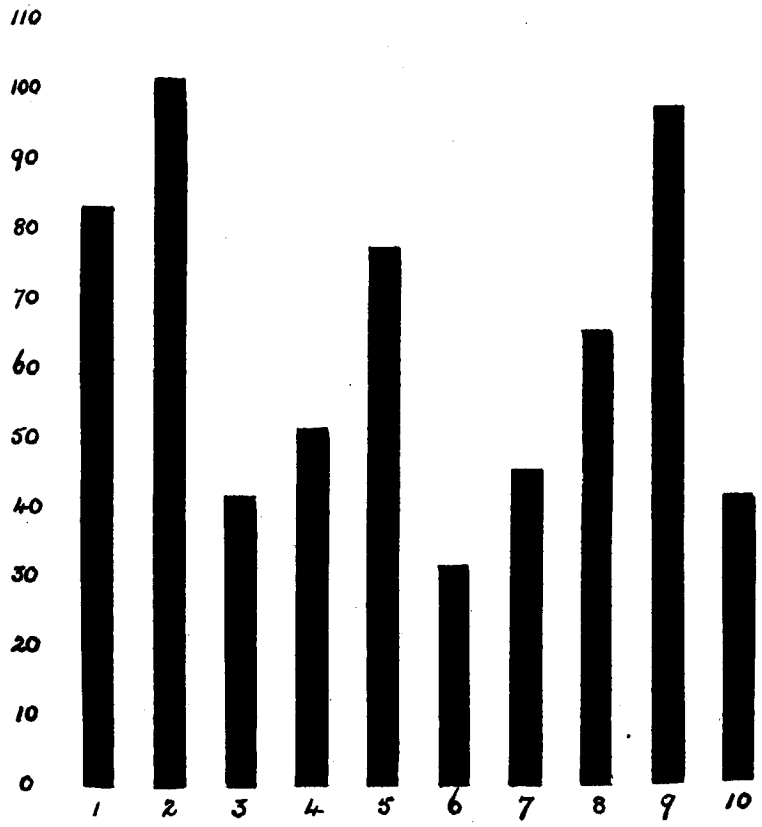
(Revision of the 1926 Experiment)

Project H-428

In Pamphlet No. 96 we reported on this project as started in 1926. After the fruiting season of 1927 the ten series in each group (nitrogen, phosphorus and potash groups) were revised and feedings on the revised basis continued for another year.

Following is an outline of the treatment which each series in each group received from the start of the project in 1926 until its final completion in 1928. The outline for the nitrogen group only is given, the other groups being the same by substituting either potash or phosphorus as the limiting factor.

PROJECT H 428
FIG III–REVISION OF 1926 EXP
POTASH GROUP



Series I: No nitrogen during 1926 and until August 1, 1927; from then on full solution.

Series II: No nitrogen during 1926 and until May 7, 1927; from then on full solution.

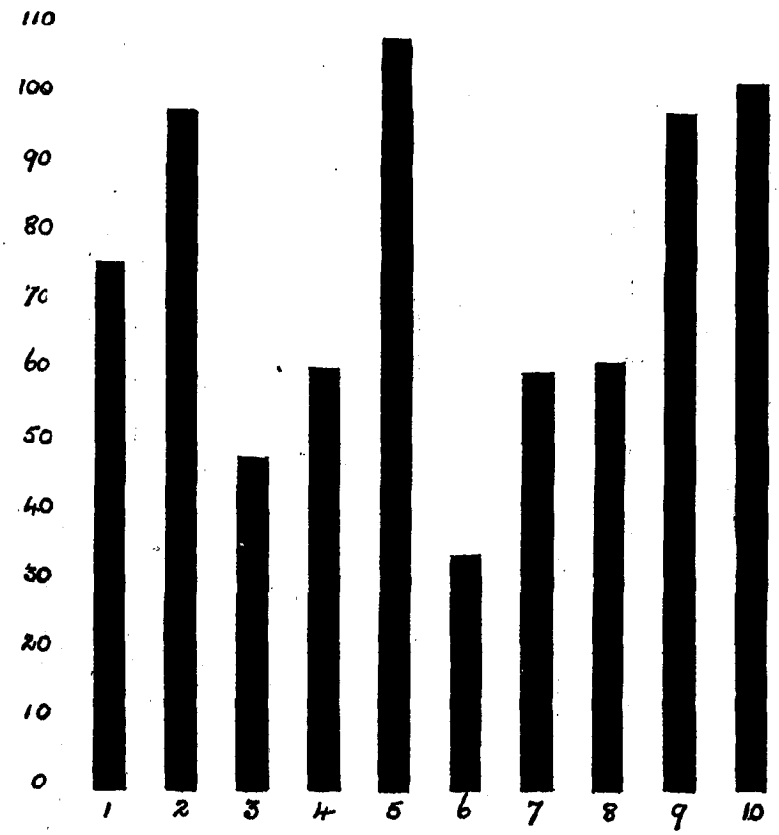
Series III: No nitrogen during 1926 and until June 6, 1927; from then on full solution until August, 1927. No nitrogen until May 3, 1928.

Series IV: No nitrogen during 1926 and until June 20, 1927; from then on full solution until September, 1927, and from then on no nitrogen until May 3, 1928.

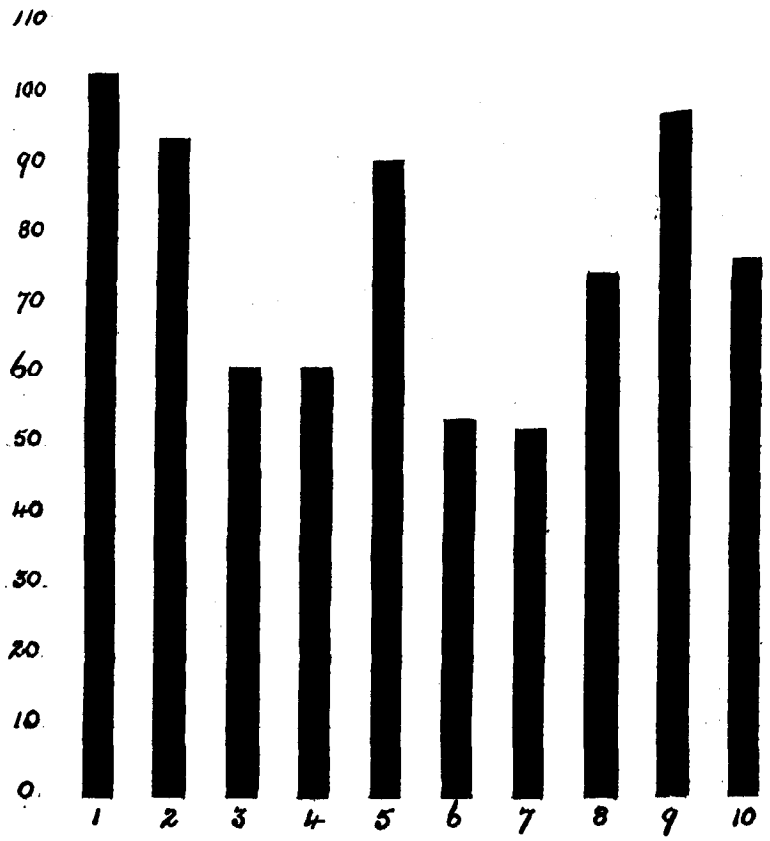
Series V: Nitrogen deficiency until August, 1927; from then on full solution.

Series VI: Nitrogen deficiency until June 6, 1927; full solution until August, then no nitrogen until May 16, 1928.

PROJECT H 428
FIG IV—REVISION OF 1926 EXP
PHOSPHORUS GROUP



PROJECT H 428
FIG V—REVISION OF 1926 EXP
NITROGEN GROUP



Series VII: Nitrogen deficiency until May 2, 1927; full solution until September, 1927, and from then on no nitrogen until May 16, 1928.

Series VIII: Nitrogen deficiency until June 20, 1927; full solution from then until September 15, 1927, and from then no nitrogen until May 16, 1928.

Series IX: Full solution throughout.

Series X: Nitrogen excess until August 27, 1927; no nitrogen from then until May 26, 1928.

Figures III, IV and V portray the yields from the series of each group during 1928.

The data are primarily of value in offering further evidence of the critical period of fruit bud formation and corroboration of the previous work, as well as the contemporary experiment reported elsewhere in these pages. In addition

it reveals the rapidity of recovery of the starved series. For instance, Series I, starved for nitrogen until August 1, 1927, recovered from its starved appearance in two weeks. The phosphorus starved series, however, took longer to recover and still showed signs of phosphorus deficiency at the end of one month. This held true of the potash series to a less extent. The graphs show that the nitrogen starved series (I) revived in time to produce as many fruit buds as a full nutrient series, while the same series in the phosphorus and potash groups did not exhibit quite as complete a recovery. Series III, IV, VI and VII by their low yields offer the corroboration of all previous and contemporary conclusions as to the importance of the fall feedings.

In Series X we have some idea of the carry over effect of the accumulation of the three elements. These Series had received excess of the element in question and in all series, except potash, this appeared to be stored either in the sand or in the plant to such an extent as to result in almost normal production despite the withdrawal of these elements from August, 1927 to the third feeding in 1928. Another interpretation of this might be that the toxicity of potash is greater than that of nitrogen or phosphorus. It is evident, however, that there is considerable room for investigation of seasonal applications of these elements with regard to the internal economy of the plant.

NITROGEN, POTASH AND PHOSPHORUS STARVATION OF STRAWBERRY PLANTS AT DIFFERENT SEASONS OF PLANT GROWTH

Project H-428—1927 Experiment

In the 1927 Report of the Division of Horticulture data were published on the effect of starving strawbery plants for different periods for the elements nitrogen, phosphorus and potash. The full results of this experiment were later published as Pamphlet No. 96, with three colour plates showing the foliage colours developed by the different groups.

Since the completion of that experiment a duplicate set of experiments has been run, in which the starvation periods were extended to make a group of series as outlined below, the nitrogen group only being given as exemplary of the other two.

Series I received a full nutrient solution throughout the life of the experiment.

Series II received full nutrient solution for a period of two weeks after potting (September 7 and 14); from then on it received nutrient solution minus nitrogen.

Series III received a full nutrient solution for a period of one month after potting (September 7 to September 29); from then on it received a full nutrient solution minus nitrogen.

Series IV received a full nutrient solution for a period of six weeks after potting (September 7 to October 13); from then on it received a full nutrient solution minus nitrogen.

Series V received a full nutrient solution for a period of two months after potting (September 7 to October 26); from then on it received a full nutrient solution minus nitrogen.

Series VI received a full nutrient solution for a period extending from time of potting to late fall (September 7 to November 5); from May 3, next year, received a full nutrient solution minus nitrogen.

Series VII received a full nutrient solution from the time of potting until the late fall; in the spring received a full nutrient solution minus nitrogen from April 27.

Series VIII received a full nutrient solution from the time of potting until bloom (May 31); from then on received a full nutrient solution minus nitrogen.

Series IX received a full nutrient solution minus nitrogen throughout the entire experiment.

Series X received a full nutrient solution minus nitrogen for a period of two weeks after potting; from then on received a full nutrient solution.

Series XI received a full nutrient solution minus nitrogen for a period of one month after potting; from then on received a full nutrient solution.

Series XII received a full nutrient solution minus nitrogen for a period of six weeks after potting; from then on received a full nutrient solution.

Series XIII received a full nutrient solution minus nitrogen for a period of two months after potting; from then on received a full nutrient solution.

Series XIV received a full nutrient solution minus nitrogen from potting until snow disappeared in spring; from then on received a full nutrient solution.

Series XV received a full nutrient solution, minus nitrogen, from potting until growth commenced in spring; from then on received full nutrient solution.

Series XVI received a full nutrient solution minus nitrogen from potting until bloom; from then on received a full nutrient solution.

Plants for this experiment were obtained by plunging 2-inch pots, filled with the pure sand used in all our work, in the field. As soon as the young runner plants were sufficiently rooted to be severed from the parent this was done and the lot taken to the feeding frames and repotted to 6-inch pots.

Applications of nutrient solutions were made in accordance with the information given in Pamphlet No. 96 of this Division.

Figures VI. VII and VIII portray graphically the number of bloom produced by the Series of each group. These results corroborate our previous finding to a marked extent and, in addition, give further information on the extension of the starvation periods.

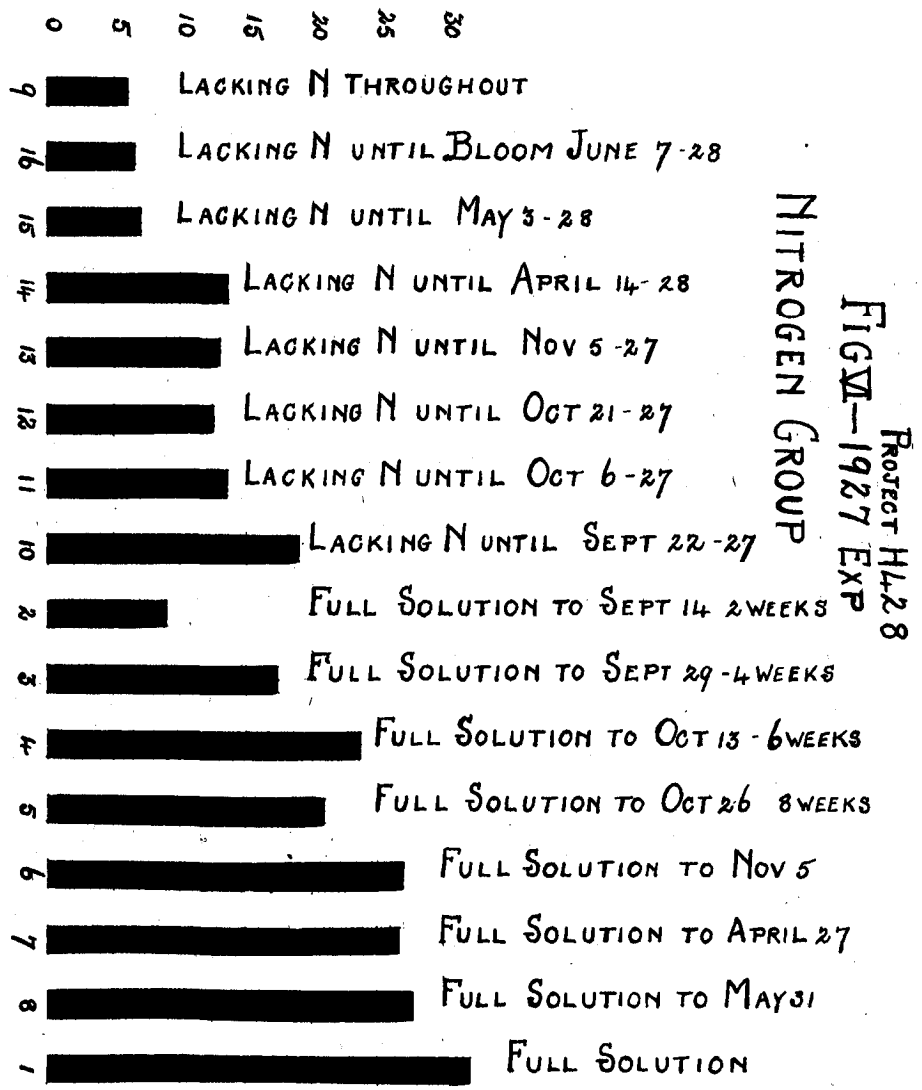
It will be noted that the yields of the series where nitrogen, phosphorus or potash was limiting throughout are much lower than reported in our previous work. This is due to the fact that the plants were severed from the parent a little earlier and subjected to starvation for a longer period. In addition the full nutrient series showed higher yields than formerly, due to their longer subjection to the full nutrient solution.

A closer examination of the graphs reveals further that the plants are more responsive to a spring correction of nitrogen starvation than they are to a spring correction of phosphorus or potash starvation. This is evidenced by an examination of the series numbered XIV. There is a distinct rise in the curve of the nitrogen group at this point, whilst the curve of the other groups remains horizontal until X is reached, when a very sharp rise in all groups is experienced. At this point the starvation factor was corrected by September 22 and that this should result in such a marked increase corroborates our past results with fruit bud formation as reported in Pamphlet No. 96, and later the cytological results as reported in Bulletin No. 110. It is further very interesting to note that a correction of nitrogen starvation on October 6 had no more effect on fruit bud formation than by delaying the correction until April 14. Evidently the month of September is a very critical period in the history of the plant. The curves would also suggest that the plants were not as rapidly responsive to potash correction as to either phosphorus or nitrogen, and that a date earlier than September 22 would have been advisable for potash starvation correction.

The sharp drop in all groups from X to II is further evidence of the critical period being around mid-September.

In all series there is a sharp rise at III, due to the extension of the full solution period. In the nitrogen and phosphorus group this rise continues to I,

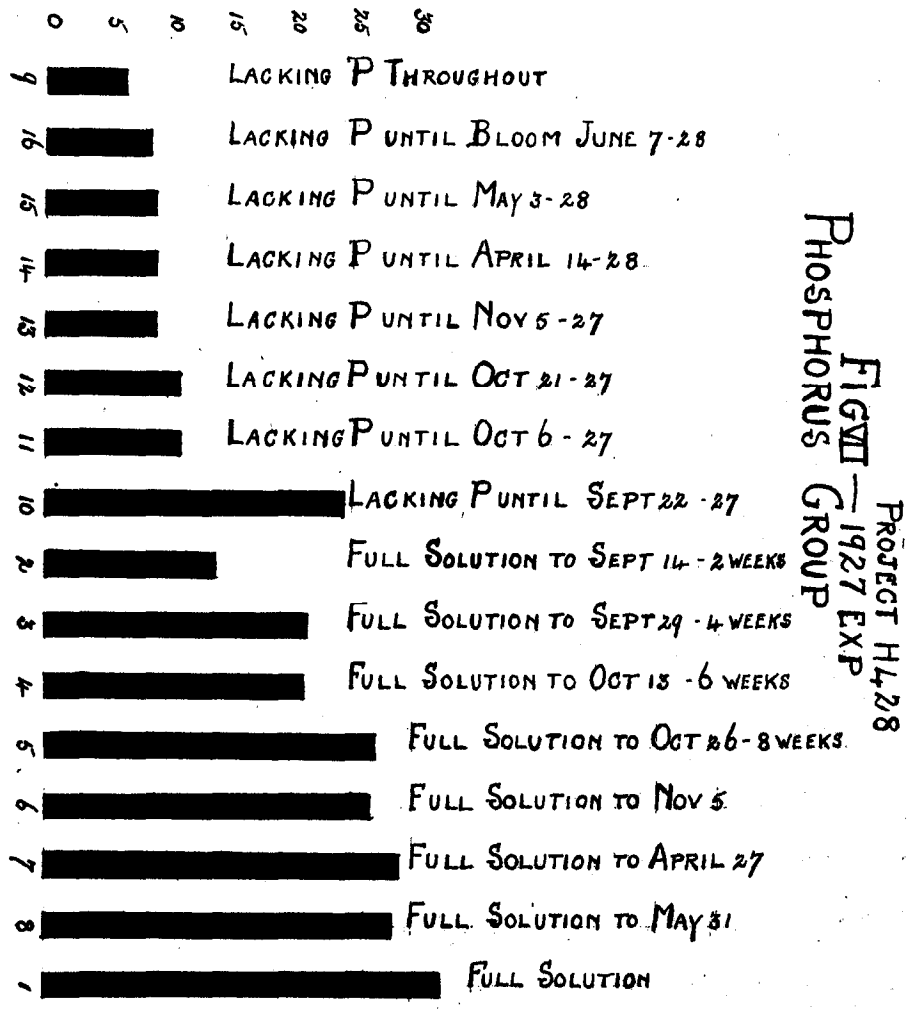
while in the potash group it rises sharply at V and drops from V to VI. Whether this is suggestive of a critical period for potash feeding or not is not known. It is being checked further. From the results at hand, however, continuation of water soluble potash after late October would appear to be of little avail and possibly its withdrawal during November would be of distinct benefit. If this is so, while withdrawal under field conditions would be impossible, the same end could possibly be accomplished by a continuance of the other elements which might possibly, by a shifting of the nutrient ratio, amount to the same thing. This is merely a suggestion and, until we have investigated further, should be left as such.



FOLIAGE TINTS

The foliage tints exhibited by the series lacking and deficient for extended periods for each of the three elements were in close harmony with those reported in Pamphlet No. 96. A survey of the notes on this phase might prove interesting.

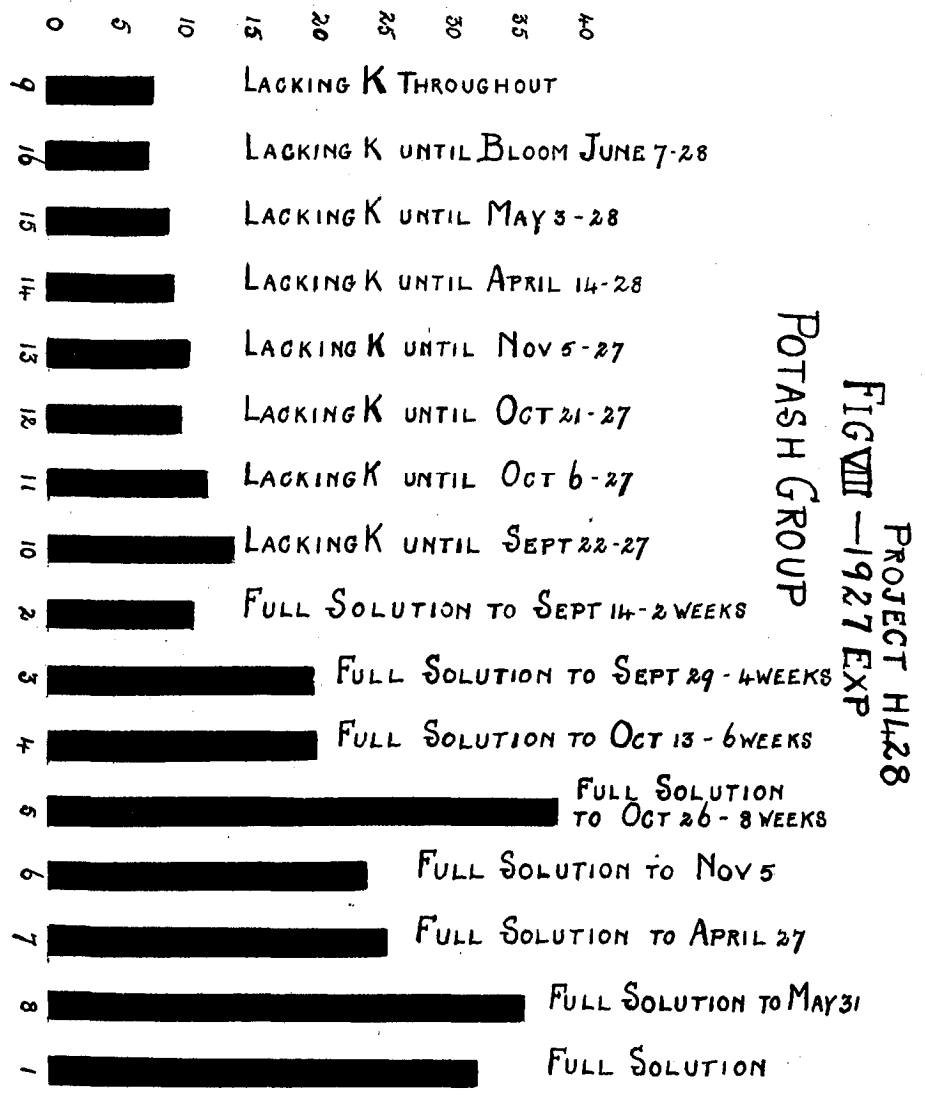
The nitrogen group: By October 18 of the first year the nitrogen starvation series were exhibiting marked signs of nitrogen deficiency, the accumulated nitrogen supply of the plants from the parent having been long since exhausted.



PHOSPHORUS GROUP — FIG VII — 1927 EXP PROJECT H428

The series where nitrogen had been the limiting factor for one month only also exhibited signs of deficiency by the yellow foliage. During the following year (first fruiting season) the nitrogen-limiting series exhibited the red tints by early June and also in the series where nitrogen had only been supplied for two weeks, one month, etc., namely, Series II, III, IV, V and even VI to a slight extent.

In the phosphorus group the starvation series, IX to XVI, showed lack of sheen on foliage by October of the first year and by late May of the fruiting year. Series I, II, III, IV and V exhibited shortened petioles, while II and III exhibited, in addition, the purple bronzing colour. Nine, the total starvation series, exhibited this bronzing to a marked extent with less purpling.



In the potash group the starvation series, IX and XI to XVI, exhibited a dull, dark green by early October, with the purpling appearing shortly after. In the following year Series II and III showed distinct purpling by late May, while IX of course exhibited the purpling to a marked degree.

In all cases the starvation series, XI to XVI, had recovered by the fruiting season, as they had been for some time in receipt of a full nutrient solution.

It is interesting to note that these colours are the same as we previously reported. As other investigators have reported no purpling with potash deficiency, but rather a browning and yellowing, we might point out that only in a few instances have we noted this. On a few plants in Series XI to XVI, during the fall of the first year, a few leaves exhibited a slight yellow on the margin, later turning to brown, or scorch. The distinct purple, however, under our conditions, appears sooner or later on the potash deficient series.

INFLUENCE OF PHOSPHORUS ON SET

In previous publications we have referred to the influence of phosphorus on the set of the bloom. This has again been amply demonstrated in the above groups. The withdrawal of nitrogen during the flowering season resulted in a set of 54 per cent. The withdrawal of phosphorus for the same season resulted in a set of only 20 per cent, while the withdrawal of potash for the same period resulted in a set of 38 per cent. The effect of phosphorus and potash on the set of the blossoms appears to be more profound than that of nitrogen.

VEGETABLE GARDENING

The season of 1928 was rather hectic so far as the vegetable garden work was concerned. Difficulty was experienced in getting the seeding and planting done, due to unfavourable weather and soil conditions. Reference to the remarks concerning the weather in the opening pages of this report will give a very good idea of the temperature and rainfall.

LINES OF WORK

During this year the plant breeding and selection work was continued with a considerable number of strains of the various varieties of vegetables. Bean, beet, cabbage, carrot, celery, corn, eggplant, lettuce, onion, parsnip, pea, pumpkin, squash and tomato, constituting the kinds that were given chief attention for the purpose of obtaining early maturity and hardiness, coupled with quality, productivity and suitability for various purposes. In addition to the above lines, variety and cultural test work was carried on as usual, which produces information concerning the performance of the various standard varieties thus enabling a check up on so called originations or introductions of recent origin. The cultural work is of value regarding methods of growing the different crops.

The production of Foundation Seed and Elite Stock Seed, in connection with the program of the Canadian Seed Growers' Association is being carried on as well. The varieties assigned to this Experimental Farm are as follows:—

Beans, Bush	Round Pod Kidney Wax.
Beet	Detroit Dark Red.
Carrot	Chantenay.
Corn	Pickaninny.
Cucumber	Davis Perfect.
Lettuce	Grand Rapids.
Onion	Yellow Globe Danvers.
	Red Wethersfield.
Parsnip	Hollow Crown.
Squash	Warty Hubbard.
Tomato	Earliana.
	Livingston Globe.

Since Foundation Seed constitutes the breeders purest grade or seed that is traceable to one plant, it is not advisable to produce this material in a large quantity owing to the danger of careless methods being employed. Therefore there will never be a quantity of such material available nor can seed growers get this grade of seed as such. To obtain the progeny of these stock plants Elite stock seed must be grown under the supervision of the plant breeder, and in such limited areas that only the purest seed will be available to those desiring the progeny of Elite stock seed for further seed growing. Elite stock seed will never be grown in sufficient quantity to become a commercial commodity.

The idea is for the Elite Stock seed to be available for the use of seed growers from which to grow the best of Registered seed which grade will be known in commerce. Very good progress has been made with all the varieties assigned to the Horticultural Division.

For the benefit of those that are interested in the production of pure seed, pamphlets have been prepared dealing with the subject and the prescribed methods. This literature should be obtained before a grower embarks upon an extensive program, so that the rules may be understood and the proper methods employed, thus entitling the grower to the proper recognition for the grades of seed produced.

TOMATO BREEDING

Breeding tomatoes for early maturity, desirable shape and good quality coupled with mild acidity has been continued. The Alacrity variety has been used in a great many combinations with varying results. In most cases hybrids are obtained that are quite early but the Alacrity character or Earliana type of fruit is difficult to eliminate and as a rule the early segregations that produce desirable sized fruit have been mostly of this type. Where Alacrity has been crossed with Bonny Best some very promising material has been obtained, but the smooth, rounded types of fruits run on the small size. However, it has been possible to obtain earliness and quite satisfactory yield. Further selection will in all likelihood give the desired size.

The Alacrity x Bonny Best cross known as Abb has been tested by some of the growers and Dominion Experimental Stations and quite favourable reports have been received from a number of them.

The variety known as Herald which is the result of a cross between Alacrity and Hipper has been doing very well both at Ottawa and several of the Branch Farms. At the Harrow Experimental Station last season, Herald yielded the best of any of the early maturing varieties.

The Livingston Globe x Bonny Best cross produced a very fine large, red fruited variety, slightly later than Bonny Best. The fruits are very firm and solid, and are mild sub acid. The skins do not crack or split easily.

The Alacrity x Earlibell cross has proved to be a good early yielder. The fruits are slightly under size but very smooth.

The following table will give a fair idea of how these cross bred varieties performed:—

PERFORMANCE OF CROSS BRED VARIETIES OF TOMATOES

Record number	Variety	Average weight of fruits in	Yield from five plants one stem on stakes	
			First two weeks	First month
		oz.	lb. oz.	lb. oz.
0-3249	Abb 28·1	4·6	5 13	14 9
0-3250	" 8·1	4·0	4 8	17 8
0-3251	" 19·1	3·9	3 9	12 0
0-3253	Livingston Globe x Bonny Best 33·1	3·2	3 10	12 2
0-3252	" " " 33·1	3·9	2 15	11 7
0-3240	Herald 53·1	3·2	2 9	11 12
0-3239	Alacrity Earlibell	3·8	2 6	11 12
0-3244	Alacrity 1.8.1-13.1	3·6	2 4	11 3

Egg plant (Black Nagasaki x Black Beauty)—hybrid plants showing fruit developed.

EGGPLANT

The breeding work with eggplants was continued this year, using the progeny of the Black Beauty x Nagasaki F2 plants as mentioned in the report for the year of 1927, the object being to get an early maturing Black Beauty type of

eggplant that can be relied upon to produce more marketable fruit than can normally be produced per plant from the Black Beauty variety under Ottawa conditions.

In the progeny tests last season it was found that three segregations proved quite satisfactory, in that fruit of desirable size was obtained from the hybrids. The fruits varied in shape considerably and also in colour but the majority of the plants produced more than one fruit that was quite attractive, besides many of these fruits ripened completely on the plants in the field, thus rendering it possible to save a quantity of seed.

In comparison with Black Beauty it was found that only a few of the Black Beauty plants fruited, the most of which were very inmature, with only a small percentage of fruits developed to marketable size, and in no case were any of the fruits developed sufficiently to obtain any seed. Therefore, it is quite evident that the hybrids possessed earliness not to be found in the progeny of the Black Beauty variety.

The Nagasaki being extremely dwarf in habit and early maturing produced an abundant crop of small sized, dark purple fruits. None of the fruits were of a desirable size. It was found that almost the entire crop had ripened on the plants in the field.

The seed was sown in the greenhouse March 21 and the plants set in the field June 12. All the varieties were handled in a similar manner thus giving a fair comparison of the hybrid with the parents.

Egg plant—Black Beauty and Black Nagasaki. These plants are representative of the parents of the early maturing large fruited hybrids.

In the following tabulation will be found data with reference to this work:—

RESULTS OF BREEDING WORK WITH EGGPLANTS.

Variety or segregation	Number of plants	Number of fruits	Average weight of the fruits	Weight of total crop	Weight of the largest fruit
			oz.	lb. oz.	lb. oz.
Black Beauty	18	12	3·7	2 13	1 12
Nagasaki	18	54	4·4	15 0	0 8
Hybrid 0-2813	44	93	8·7	51 0	2 3
Hybrid 0-2814	56	120	10·4	78 0	1 15
Hybrid 0-2815	32	60	8·9	33 0	1 10

It will be noticed further that Black Beauty produced a relatively small amount of fruit when compared with Nagasaki, and it will also be noticed that the hybrid 0-2813 outyielded both parents, besides producing a better average sized marketable product.

MELONS UNDER VITA GLASS, COMMON GLASS AND CEL-O-GLASS

This season a rather interesting experiment was conducted for the purpose of determining the effect of different kinds of box covers for melon growing, various claims having been made by different firms regarding the value of the different types of transparent materials such as glass and substitutes.

It is known that ultra violet rays are essential to proper growth, but the cost of the material to render it possible for such conditions to be obtained, coupled with the longevity of the material to render service as well as ample increase in the net return, must enter into the question.

Boxes 24 by 24 inches were provided which were 9 inches deep. Five were covered with common glass double diamond, five with Vita Glass, a special glass that is porous to ultra violet rays, and five were covered with Celo-O-Glass, a glass substitute made of fine screen wire impregnated with a clear substance that allows the passage of light, and is claimed to allow more of the ultra violet rays to pass through than ordinary glass. This test was conducted in duplicate using the same varieties of melons.

The melon seed was sown in strawberry boxes that had been filled with soil and placed in a hotbed on April 19 and planted in the boxes in the field May 25. Three plants were set in each box and the covering material put on.

On July 5 the vines were measured, to get some basis of comparison as to the actual influence the different materials might exert on their growth. In addition to this the laterals developed were recorded. The record has been made of the length of each vine in the frames as well as the runners corresponding with the vines.

RESULTS WITH MELONS UNDER DIFFERENT GLASSES

Record No.	Variety	Common Glass* D.D		Vita Glass* D.D.		Cel-O-Glass	
		Length of 3 main vines	Number of laterals on 3 vines	Length of 3 main vines	Number of laterals on 3 vines	Length of 3 main vines	Number of laterals on 3 vines
		in.		in.		in.	
O-3673	Rittenhouse Special	15- 7-12	2-3-3	36-14-25	3-1-2	1-1-2	0-0-0
O-3699	Rittenhouse Special	14-15-17	4-3-3	13-17-18	4-3-5	4-4-0	0-0-0
O-3674	Orange Flesh	10- 8-12	2-1-2	18-20-23	2-1-5	0-0-0	0-0-0
O-3700	Orange Flesh	16-12-14	3-3-2	19-20-12	3-4-1	7-4-6	1-0-0
O-3675	Lake Champlain	32-29-32	4-5-5	15- 7- 0	5-2-0	0-0-0	0-0-0
O-3702	Lake Champlain	18-22-13	4-5-4	25-15-18	4-3-4	4-6-4	0-1-0
O-3676	New Winter Pineapple	14-11-15	2-1-2	22-10-20	4-0-1	0-0-0	0-0-0
O-3701	New Winter Pineapple	11-14- 5	3-1-0	13- 7- 0	3-0-0	2-3-2	0-0-0
O-3677	Prospero	29-14-24	5-2-5	23-19-24	5-2-6	0-0-0	0-0-0
O-3703	Prospero	13-16-11	2-4-2	15-15-16	3-4-4	5-5-4	2-0-0
	Totals	475 inches	87 laterals	499 inches	84 laterals	64 inches	4 laterals

*D.D. Double diamond thickness of glass.

It seems quite evident that the Vita Glass did exert a slight difference in the total length of vine growth over the common glass and both common glass and Vita Glass proved better than Cel-O-Glass. These results are based on a one year test which might be contrary to the finding of another season. Nevertheless it shows quite clearly that the difference between the results from one type of glass over the other is not very great, at least under these conditions. So far as the yields between the plants under the two types of glass were concerned there was only a slight difference that was not worth while estimating, due to the fact that the difference might easily be attributed to various minor causes. The plants under Cel-O-Glass did not make much growth and might be termed a failure.

Just before the vines were frozen a record measurement was taken of the vine lengths and it was found that the greatest length was made by vines grown under Vita Glass, followed quite closely by common glass. The Cel-O-Glass grown vines were very short.

Vita Glass gave an average vine growth of 94·0 inches.

Common Glass gave an average vine growth of 82·6 inches.

Cel-O-Glass gave an average vine growth of 42·0 inches.

PICKLING CUCUMBERS UNDER HOT KAPS

The use of plant forcers has become quite general in certain sections where tender crops are grown for early market. The object of using these is to enable the sowing of the seed out of doors in the open field some days previous to the regular date to avoid late frost injury and to hasten germination. Cucumber boxes with glass covers are quite generally used but the cost is considerable, besides requiring valuable space for storage after the season of usefulness is past. There is also a lot of breakage with glass which soon mounts up the cost of the equipment.

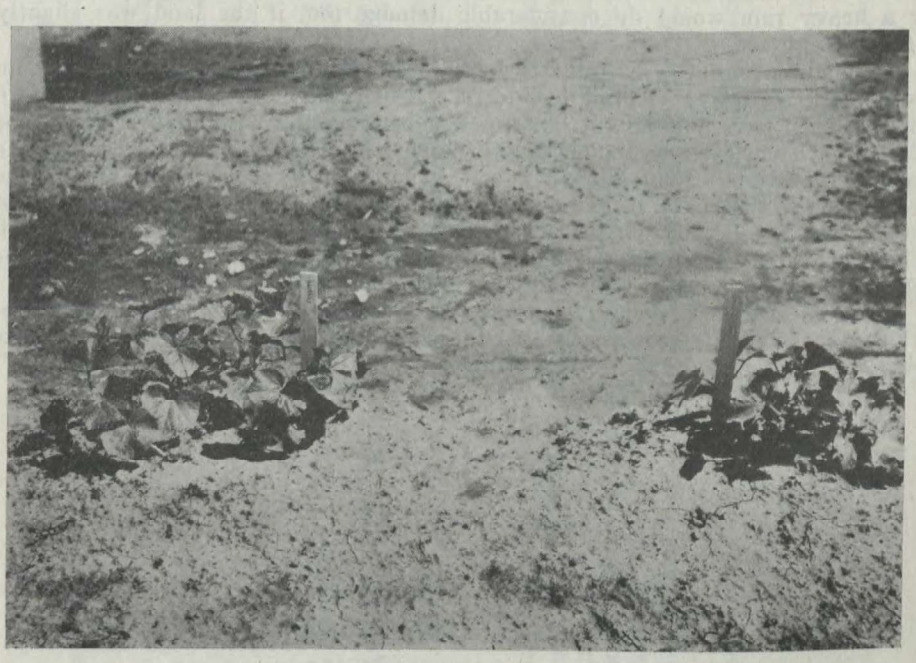
Hot Kaps, which are made of a waterproof white paper and dome shaped, can be purchased at a reasonable cost per thousand. There is a special metal setter that is necessary to set the caps in place over the hill.

This past season six strains of pickling cucumbers were tested. Two hills of each were planted May 28. One hill of each strain was covered with a hot kap. In the following table the data are to be found.

RESULTS OF TEST OF PICKLING CUCUMBERS

Record number	Variety	Received from	How treated	Date of germination	Date ready for use	Number of fruits
O-3728	Chicago Pickling No. 1	O.A.C.	Hot kap.	7–VI	23–VII	318
O-3728	Chicago Pickling No. 1	O.A.C.	Open	10–VI	24–VII	432
O-3729	Chicago Pickling No. 2	O.A.C.	Hot kap.	6–VI	21–VII	192
O-3729	Chicago Pickling No. 2	O.A.C.	Open	9–VI	25–VII	126
O-3730	Chicago Pickling No. 3	O.A.C.	Hot kap.	7–VI	23–VII	462
O-3730	Chicago Pickling No. 3	O.A.C.	Open	10–VI	26–VII	240
O-3731	Heinz Pickling No. 1	O.A.C.	Hot kap.	6–VI	25–VII	393
O-3731	Heinz Pickling No. 1	O.A.C.	Open	9–VI	25–VII	102
O-3732	Heinz Pickling No. 2	O.A.C.	Hot kap.	6–VI	25–VII	320
O-3732	Heinz Pickling No. 2	O.A.C.	Open	10–VI	25–VII	234
O-3733	Heinz Pickling No. 3	O.A.C.	Hot kap.	6–VI	Plants died	
O-3733	Heinz Pickling No. 3	O.A.C.	Open	11–VI	26–VII	184

It was found that the hills covered with Hot Kaps germinated three to five days earlier than those left open or without protection. There was little difference in the date of ready for use. The yield from these hills varied considerably, but it would seem that there was some advantage gained in this respect as well.



Hot-kap on the left, no hot-kap on the right. Note the difference of development.

MULCH PAPER EXPERIMENT—READY ROOFING

TOMATOES

The use of mulch paper in connection with the growing of garden crops has been attracting a great deal of attention during the past two years. Many claims have been made in favour of this material, regarding its value in the control of weeds, increasing the soil temperature, conserving soil moisture, stimulating plant growth and increasing the returns enormously. This year a small experiment was again conducted using tomatoes as the crop and half-ply asphalt impregnated paper which is a thin grade of ready roofing. This material can be obtained in rolls of 200 square feet at the cost of $2 per roll, which makes this kind of gardening a rather costly means of obtaining crops. There are, however, cheaper materials that are manufactured expressly for this purpose, one of which is known as Gator Hide. It can be obtained in rolls 18 inches wide and 36 inches wide.

The preparation of the land on which mulch paper is to be used should be the same as for any garden crop, but extra care must be taken to have the surface smooth and fairly even so as to have the paper lie close to the ground. If the ground has an uneven surface it will be found difficult to keep the paper in place. To fasten the mulch in place the edges and ends should be covered well with earth, and where the paper laps, fasteners made of a fairly stiff grade of wire that can be pushed 8 or 10 inches into the ground will be found very satisfactory, or stones may be used as weights to hold the paper down until the plants develop sufficiently to hold the paper down in place. Careful fastening is very important since a heavy wind would be liable to carry the paper away or a heavy rain would do considerable damage too, if the land was slightly sloping.

The three varieties of tomatoes used were Bonny Best, Abb, which is an early maturing heavy yielding hybrid of considerable merit, and Earliana. Two plots of each were planted out on June 8, consisting of six plants per plot. One plot of each variety was mulched with paper while the other plots received the usual cultivation. Some difficulty was experienced in the early part of the season due to the heavy rains carrying the paper out of place. In fact this past season was not favourable to such a test on account of the excessive rain fall which provided the cultivated plots with plenty of moisture, thus enabling the plants to grow almost as well as those under the mulch.

It was observed however that the plants under the mulch did make somewhat more vigorous growth whereas those on the cultivated plots, while quite vigorous, did not make the spread of vines.

In the accompanying table the results of the test are summarized:—

RESULTS OF MULCH PAPER TEST WITH TOMATOES

Record number	Variety	Received from	Treatment	Ready for use	The Month				The Season				Green	
					Marketable ripe		Unmarketable ripe		Marketable ripe		Unmarketable ripe			
					Number of fruits	lb. oz.	Number of fruits	lb. oz.	Number of fruits	lb. oz.	Number of fruits	lb. oz.	Number of fruits	lb. oz.
O-1843A	Bonny Best	Stokes	Mulch	21-VIII	9	2 7	4	1 9	273	88 12	14	2 1	925	187 8
O-1843A	Bonny Best	Stokes	No mulch	11-VIII	28	6 7	.....	.....	206	56 4	8	1 8	755	204 0
O-1843B	Alacrity x Bonny Best	C.E.F.	Mulch	11-VIII	104	18 3	.....	.....	577	135 0	24	3 14	300	45 0
O-1843B	Alacrity x Bonny Best	C.E.F.	No mulch	29-VII	76	15 5	3	1 3	201	55 0	20	4 9	300	52 0
O-1843C	Earliana	Moore	Mulch	13-VIII	20	5 15	12	3 10	173	47 0	29	6 0	100	18 0
O-1843C	Earliana	Moore	No mulch	29-VII	21	5 14	6	2 9	55	15 9	.....	.....	158	22 8

In the foregoing table it will be noticed that in every case the plots that were not mulched with paper were earlier in ripening some fruit as indicated in the column ready for use. There was only a slight difference in the number of pounds per plot in the month for all varieties and plots, with hardly enough increase in any case to warrant the cost of the paper let alone the time of placing on the plots. In the season the yield was decidedly in favour of the mulch but the price of tomatoes had dropped considerably by this time.

When the mulch was removed it was found that the rootlets were up to the surface of the ground and the soil was quite moist.

The weed nuisance was completely eliminated from the mulched plots which was a decided advantage.

PEAS

The breeding of small sized canning peas with a high sugar content has been under way for several seasons. The results to the present have been very satisfactory in that some of the segregations obtained this year from crosses between Serjette d'auvergne and Green Sweet and White Sweet crossed with Pois de Roston have produced peas of very fine quality and extremely small in size. Besides this they are quite resistant to root-rot and very prolific pod producers. The twin pod character or where the pods are produced in pairs has been found to predominate. The dry seeds were weighed and it was found that in many cases the number of seeds per ounce exceeded any of the standard varieties. A further check on the progeny of the small seeded segregations will be made in 1929.

The crosses with Thomas Laxton and English Wonder have proved very good. The vines are dwarf in habit producing a heavy crop of medium sized pods, with peas that are medium to small in size, a fairly good green colour and very sweet and tender. This cross and the reciprocal are quite free from root-rot.

The crosses and reciprocal crosses between Laxton Progress, a dwarf large podded variety, and English Wonder and Alaska have produced some fairly good segregations. Some of the segregations are large podded like the Laxton Progress but are more productive and possess the sweetness of Laxton Progress.

CORN

Hybridising of sweet corn has been continued in the hope of getting something earlier maturing and sweeter and more tender than the average of early sweet corn. It is true that Pickaninny is the earliest maturing sweet corn yet found, but the colour does militate against it when the ears are slighly past ready for use. In a great many crosses made using the Pickaninny as one parent improved quality has been obtained, but some factor or other prevents it from further segregation. Crosses with Pickaninny and Golden Bantam have resulted in the production of very sweet tender yellow corn, but in the early maturing segregations the quality was very much below that desired. These segregations have been again used in recrossing with Pickaninny, but nothing definite can be said about them yet.

Banting, which was the result of a cross between Howes' Alberta Flint, a yellow early maturing flint corn, and Pickaninny, the segregations of which proved to be the earliest early yellow sweet corn with very good quality, was crossed with Pickaninny to increase the quality and sweetness. Several of the segregations are quite promising.

Golden Bantam and Pickaninny crosses and the reciprocal crosses that have reached the F6 segregation have been found to possess exceedingly good quality. They have been found to be extremely tender and sweet, but the earliness of Pickaninny was lost to a great degree. They are, however, several days earlier than Golden Bantam. All these segregations have been selected for a yellow corn. There has been less smut present in these hybrids than in Pickaninny. These observations have been made under field conditions only.

Golden Bantam was crossed with Red Cob Cory or Early Dighton with the result that there is a fairly well fixed red cob yellow corn slightly earlier maturing than Golden Bantam with fair quality. In nearly all the segregations, with rare exception, there was a decided coarseness resembling the Red Cob Cory.

Paramount, an early maturing flint corn, was crossed with Banting. The resulting hybrids have been earlier maturing than Banting, but the quality could not be determined as yet.

The Pop corn varieties have been used also in an effort to produce a variety that would develop a number of ears per plant, and plants that would stool. Some of the crosses between Iroquois, Pop and Golden Bantam have shown both the stooling and multiple ear habit of the pop corn coupled with fairly good quality. They, however, were in the same season as Golden Bantam.

CABBAGE

To purify and fix the type of Extra Amager Danish Ballhead and Golden Acre cabbage intensive inbreeding has been carried on with three generations of plants. To the present improvement can be reported in the case of the inbred strains, the desirable plants having been selected from a large population of each of the inbred strains each year. These plants were carefully lifted and put in 12-inch pots in October, and put in the root cellar before the severe weather arrived. During the latter part of January they were taken to the greenhouse to be grown under cool conditions at a temperature around 60 degrees. The heads were cut crosswise with a knife to allow the seed stalks to develop unhampered. When the first flowers opened and were in condition they were pollinated with a fine hair brush. The pollen from the flowers of the same plant was put on the pistils. In the progeny of the first inbred plants there was a wide range of variation, but in the fourth generation very good uniformity has been obtained. By growing the plants in the greenhouse it is possible to get seed ripened in time for the May sowing of seed out of doors, thus gaining time in the purification of varieties.

TOMATO

VARIETY TEST

In the tomato comparison test this year eighty varieties and strains of commercial origin were tested and one strain of the Abb hybrid that is breeding true was included for the purpose of checking up the yielding ability of these and to determine their adaptability to the market conditions in the Ottawa district. The plans were all trained to one stem and tied to five foot stakes, thus they were allowed to produce five trusses or clusters of fruit. The early maturing varieties, most of which were of the Earliana type, ripened all the fruit that developed, while the large growing sorts did not ripen all the fruit. Hence the record for fruiting was based upon the season being divided into the first two weeks, the month and the total yield of ripe fruit up till the plants were killed by frost.

However, it should be pointed out that the greatest returns from a tomato plantation should be obtained from the crop picked during the early part of the tomato season, or in other words during the first two weeks or at the latest during the month. Late tomatoes are not always profitable to market, when the time of the pickers is considered and the price of baskets to market them in is deducted. A good crop of really early tomatoes should be the object of every grower.

The sowing of the seed has been done consistently each year for this crop as near to April 17 as possible. This year the seed was sown April 16 in the greenhouse and planting in the open field was done between June 8 and 10. The season of earliness was established by the first picking of Alacrity which was made July 31 which was 106 days from seed sowing to ripe or ready for use.

In the following table will be found the performance of the eighty-one varieties and strains:—

RESULTS OF VARIETY TEST OF TOMATOES

Record Number	Variety	Source	Two weeks				Month			Season			
			Number of fruits	Average weight of marketable fruits	Marketable	Unmarketable	Number of fruits	Marketable	Unmarketable	Number of fruits	Marketable	Unmarketable	Green
				oz.	lb. oz.	lb. oz.		lb. oz.	lb. oz.		lb. oz.	lb. oz.	lb. oz.
O-3250	Alacrity X Bonny Best	C.E.F.	18	4·0	4 8	0 0	80	17 8	0 0	100	22 0	0 0	3 13
O-3329	Danish Export	Wiboltt	21	3·4	4 0	0 0	79	14 4	0 6	133	22 14	0 5	5 4
O-3263	New York 5-1	Geneva	9	5·7	3 4	1 0	49	15 8	1 3	99	26 3	1 3	5 14
O-3084	John Baer	Ands. Mt	10	4·8	3 0	0 10	27	8 13	0 12	53	19 0	2 3	6 8
O-3264	Fargo	N.D. Ex. Sta	16	2·9	2 15	1 0	48	9 7	2 0	56	11 0	2 4	0 5
O-3308	Duke of York	Carter	11	3·8	2 10	0 0	34	8 10	0 0	64	15 15	0 2	6 8
O-3287	Canadian	Andrews Mt	8	5·0	2 8	0 10	36	9 10	2 10	75	18 12	4 8	10 4
O-3298	Wayahead	Bruce	11	3·4	2 6	0 0	49	12 10	0 7	78	20 2	0 9	0 0
O-3284	John Baer	Moore	4	9·5	2 6	0 0	20	8 3	0 11	57	22 12	0 14	9 1
O-3258	Brittania	B. Hurst	7	5·1	2 4	0 14	49	14 4	2 10	80	22 0	3 15	2 0
O-3288	Canadian	Harris	7	4·5	2 0	0 6	43	10 8	1 3	76	17 12	2 11	4 4
O-3289	Canadian	Rice	5	6·0	1 14	0 8	36	11 0	1 7	73	20 15	1 15	4 9
O-3315	I.X.L.	Patmore	5	5·8	1 13	0 2	36	9 10	1 14	67	16 7	2 5	1 0
O-3328	Early Atlantic	Mck	8	3·5	1 12	0 5	38	10 14	1 12	76	15 1	1 12	1 3
O-3304	Essex Wonder	Rennie	8	3·5	1 12	0 8	76	14 10	0 3	155	29 9	0 3	7 8
O-3326	Sparks Earliana	Burpee	6	4·6	1 12	0 8	92	14 0	2 8	98	22 9	3 5	2 4
O-3318	Marvana	Pritchard	5	5·4	1 11	0 8	26	8 2	2 4	65	20 8	3 8	7 1
O-3286	Select Earliana	Moore	6	4·3	1 10	1 2	43	11 4	3 4	80	20 7	4 0	0 0
O-3285	Avon Early	Dreer	4	6·0	1 8	0 6	45	13 9	1 14	74	20 14	2 0	3 10
O-3325	New Gregory	Gregory	4	6·0	1 8	1 8	38	12 4	2 7	62	19 5	2 9	0 12
O-3306	Princess Mary	McK	7	3·2	1 7	0 13	49	11 9	1 8	84	19 11	1 12	7 6
O-3283	John Baer	S.B.	5	4·4	1 6	0 0	31	8 4	0 4	69	20 0	1 4	9 7
O-3310	Beauty of Lonains	Herb	6	3·6	1 6	1 0	33	7 4	2 8	50	9 7	2 8	1 11
O-3268	Carter Sunrise	Carter	8	2·5	1 4	0 0	57	9 7	0 0	138	21 5	0 0	9 5
O-3297	Burbank	Burbank	3	6·6	1 4	0 0	32	7 11	0 6	81	18 4	1 4	2 7
O-3276	June Pink	Livingston	5	3·8	1 3	0 6	38	10 14	2 12	77	20 9	3 12	1 3
O-3279	Chalk Early Jewel	Andrews Mt.	3	6·0	1 2	0 3	26	8 2	1 2	56	18 9	2 2	9 8
O-3260	John Baer 31	Geneva	6	2·8	1 1	1 6	38	10 11	4 4	60	15 11	4 10	1 12
O-3262	Bonny Best	Conn. Exp. S.	3	5·3	1 0	0 0	32	11 5	1 13	69	24 14	3 1	6 4
O-3321	Red Head	Langdon	3	5·3	1 0	0 8	33	9 1	0 14	68	19 8	3 14	6 15
O-3295	Earliest Producer	Child	5	3·2	1 0	1 0	44	11 7	2 0	98	25 4	2 9	1 6
O-3303	Raycroft	Johnson	5	3·2	1 0	0 0	27	8 0	0 10	55	15 0	1 4	9 5
O-3301	Open Air	Sutton	4	4·0	1 0	1 12	32	6 14	2 4	58	12 9	2 11	4 2
O-3277	June Pink	S. B.	4	3·5	0 14	0 0	29	9 12	4 11	61	16 3	5 13	2 15
O-3290	Canadian	S.B.	2	7·0	0 14	1 8	34	9 15	6 15	64	19 14	10 2	0 0
O-3332	XXX Round Scarlet Skin	Rennie	3	4·6	0 14	0 0	22	7 0	1 2	49	16 3	1 2	8 2

O-3313	New Conqueror	Webb	4	3·2	0	13	0	6	33	5	8	0	7	65	23	11	1	11	5	0
O-3261	Bonny Best (Campbell)	H.R.M	4	3·2	0	13	0	0	22	6	14	0	4	63	21	4	0	10	14	0
O-3265	Kondine Red	Sutton	2	6·0	0	12	0	0	43	11	2	1	1	114	24	0	1	1	10	2
O-3327	Penn. State Earliana	Stokes	4	3·0	0	12	0	4	30	8	10	2	7	85	21	14	2	11	2	2
O-3292	Rosy Morn	Livingston	3	4·0	0	12	0	0	23	6	4	0	2	43	11	2	0	2	8	6
O-3294	Success	Bruce	2	6·0	0	12	0	0	15	4	1	0	0	51	13	7	0	10	8	7
O-3296	Atlantic Prize	Bruce	3	4·0	0	12	0	1	13	3	5	0	4	39	11	8	1	2	9	12
O-3317	Marvana	Harris	3	4·0	0	12	0	0	16	6	1	3	0	50	15	3	3	4	6	1
O-3322	Bloomsdale	Langdon	3	4·0	0	12	0	8	13	4	10	2	5	37	15	6	1	6	11	1
O-3270	Grand Rapids	S.B	4	2·5	0	10	0	0	58	12	3	0	0	127	25	3	0	0	10	6
O-3267	Early Sunrise	S.B	4	2·5	0	10	0	0	50	7	14	0	9	131	20	10	0	9	6	8
O-3334	Florida Special	Bolgiano	3	3·3	0	10	0	4	20	5	8	0	1	57	18	0	1	15	10	8
O-3311	Paris Market	Herb	2	5·0	0	10	0	0	18	5	6	1	10	64	15	2	6	4	5	10
O-3307	Perfection	Carter	3	2·6	0	8	0	0	98	12	6	0	7	169	26	11	0	7	3	2
O-3269	Grand Rapids	Webb	1	8·0	0	8	0	0	35	9	14	0	0	126	20	1	0	6	7	8
O-3281	Bonny Best	Moore	2	3·0	0	6	0	0	34	10	11	0	2	79	22	9	0	10	6	8
O-3257	Every Day	Sutton	1	6·0	0	6	1	4	33	11	6	2	4	45	14	14	0	0	9	8
O-3336	Select Recruit	Searle	2	2·0	0	4	0	1	68	11	0	0	8	219	25	4	0	12	6	15
O-3274	Golden Queen	Sutton	2	2·0	0	4	0	0	91	13	5	0	0	181	27	9	0	0	0	0
O-3237	Langportiana	Kelway	1	4·0	0	4	0	0	46	10	6	1	8	87	21	0	1	6	6	3
O-3205	Early Large Red	Sutton	1	4·0	0	4	0	0	30	8	12	1	2	85	24	3	1	2	6	1
O-3330	Essex Wonder	Rennie	2	2·0	0	4	0	0	39	8	0	0	0	125	22	4	0	0	11	7
O-3302	Every Day	Sutton	1	3·0	0	3	0	0	46	10	1	0	1	103	23	3	0	1	12	3
O-3278	Early Jewel	Langdon	1	3·0	0	3	0	0	16	6	2	0	8	51	22	2	0	14	0	0
O-3259	Viking	N.D. Exp. Sta	1	3·0	0	3	1	4	23	5	13	8	12	31	6	14	8	12	0	0
O-3320	Red Rock	Langdon	1	3·0	0	3	0	0	14	4	6	0	13	36	12	7	0	13	7	4
O-3335	Monumental	Bolgiano	3	3·0	0	3	0	0	9	2	11	0	10	36	14	3	1	5	10	2
O-3300	Princess of Wales	Sutton	1	2·0	0	2	0	0	40	10	6	0	0	86	19	14	0	10	10	2
O-3337	Eldorado	Kelway	1	2·0	0	2	0	0	51	9	5	1	1	125	20	5	1	5	6	8
O-3280	Bonny Best	Stokes	.....	.....	.....	.....	.....	.....	25	8	15	0	0	55	20	3	0	0	9	2
O-3299	Best of All	Sutton	.....	.....	.....	.....	.....	.....	43	8	13	0	4	110	21	11	0	4	8	8
O-3265	Kondine Red	Frith	.....	.....	.....	.....	.....	.....	60	8	9	1	4	135	26	11	1	5	7	15
O-3275	Livingston Globe	Livingston	.....	.....	.....	.....	.....	.....	20	7	8	0	0	70	11	0	0	5	11	5
O-3319	Marglobe	Stokes	.....	.....	.....	.....	.....	.....	22	6	7	0	9	58	14	0	0	13	7	4
O-3314	New Emperor	Webb	.....	.....	.....	.....	.....	.....	31	6	7	0	5	75	15	5	0	5	8	14
O-3331	Pink Skin	Rennie	.....	.....	.....	.....	.....	.....	13	5	3	0	6	39	15	5	0	9	13	10
O-3316	Marglobe	Harris	.....	.....	.....	.....	.....	.....	14	4	1	0	0	49	14	15	0	1	8	14
O-3312	Wonder of Italy	Herb	.....	.....	.....	.....	.....	.....	64	3	7	0	0	290	3	5	0	0	8	8
O-3309	New Tree		.....	.....	.....	.....	.....	.....	15	3	6	0	6	42	9	14	0	6	2	13
O-3291	Golden Sunrise	S. B	.....	.....	.....	.....	.....	.....	10	2	0	0	0	35	10	0	0	0	7	2

SMALL FRUITED VARIETIES

O-3273	Red Cherry	Ewing	20	0·4	0	8	0	0	131	2	9	0	0	225	5	1	0	0	1	11
O-3272	Yellow Plum	Ewing	11	0·3	0	4	0	0	104	3	10	0	0	171	6	11	0	0	2	0
O-3271	Yellow Plum	Graham	1	1·0	0	3	0	0	72	2	13	0	0	133	5	4	0	0	1	3
O-3293	New Yellow Cherry	S.B	13	0·15	0	2	0	0	80	0	15	0	0	141	1	11	0	0	0	11
O-3333	Small Fruited Mixture	Rennie	.....	.....	.....	.....	.....	.....	50	2	2	0	0	131	7	10	0	0	5	4

It will be noticed that one of the hybrid varieties which is a cross between Alacrity and Bonny Best out-yielded all the other varieties in both the two week period and in the month. The fruit produced by this hybrid was not large in size but decidedly smooth and rounded, all the fruit being marketable, and resembling Bonny Best to a very great degree.

Two varieties of recent origin supplied for test by the North Dakota Experimental Station, are Fargo and Viking. These two varieties differ greatly from all the other sorts in that the plants are quite dwarf. Of the two Fargo did considerably better than Viking. The former was fifth in order of yield. Neither of these varieties should be trained to stakes but should be let grow on the ground.

ONIONS

The inbreeding of Yellow Globe Danvers and Red Wethersfield onions, for the purpose of purifying the varieties and to establish greater uniformity, has been carried on in the greenhouse. The desirable bulbs having been selected in the autumn were planted in 8-inch pots and stored in a cool place to root. During the later part of January the pots are taken to the greenhouse, and kept at a temperature around 65° degrees. It has not been possible to grow two generations in the one wear, but there is greater ease of working the flowers since insects do not have to be reckoned with. Some very good strains of the two above mentioned varieties have been obtained.

Cross breeding of onions has been undertaken in an endeavour to develop early maturing varieties. White Barletta has been crossed with Early Flat Red, Red Wethersfield, Yellow Globe Danvers and Sweet Spanish. Some of the crosses indicate early maturity and fair quality.

PURITY TEST

This season the purity test of varieties for trueness to variety and to determine if any of those submitted under new names were the same as any of the standard or known varieties was conducted. There were 168 samples supplied by forty-three firms and individuals. In a great many cases it will be seen by the tabulated information that quite a few varieties resembled old established varieties.

The varieties are arranged under the firm name supplying the seed or the name of the individual.

It should be pointed out that some of the samples under test were sent in by the various seed inspectors employed by the Seed Branch, Department of Agriculture, while some of the others were sent in voluntarily by the individuals themselves.

SUTTON & SONS, READING, ENGLAND

Bean	O-3776	The Prince	An early maturing bean of the Masterpiece type, though quite different. Anthracnosed badly.
	O-3777	Peerless	Somewhat the same as Dwarf French Kidney but late maturing, though distinct enough.
Broccoli	O-2235	Early Roscoff	The plants were very uniform but produced no heads. Quite distinct.
Brussels Sprouts	O-2234	Fulbasket	Variable in habit of growth. Not as good as Dalkeith.
Celery	O-2427	Giant White	Distinct from the varieties under test.
Corn	O-3410	First of All	Decidedly different from any other variety.
Lettuce	O-3579	Arctic	This variety performed poorly, a large number of plants bolted to seed quite early while other plants developed like Big Boston.

SUTTON & SONS, READING, ENGLAND—*Concluded*

Lettuce	O-3580	Spring Beauty	A mixture, some plants were like Arctic while others were true cos.
Swede	O-3591	Bronze Top	A very true strain somewhat like Hartley Bronze Top.
Tomato	O-33-2	Every Day Prince	A variety resembling closely the Prince of Wales and Best of All.

WM. RENNIE

Bean	O-3778	XXX Bush Butter	A mixture of green and waxpods.
	O-3779	Bush Green Pod	True Stringless Green Pod.
Beet	O-3623	Globe XXX	12 Globe, 21 Crosby Egyptian, 3 Flat Egyptian, 1 Scarlet Mangold.
Broccoli	O-3797	Curtes Perennial	Only leaves developed.
Cabbage	O-2909	Autumn Winter XXX	Mixture, not two plants alike, likely a strain of Danish Ballhead.
Cabbage	O-2908	Baby Head	True to one type, good—should be called Dwarf Flat Dutch or Early Summer.
Carrot	O-3613	Table XXX	Mostly Nantes with a few French Forcing and Chantenay.
Carrot	O-3614	Market Garden	A fairly good strain of Danvers.
Corn	O-3528	XXX Early Sweet Table	Not early-comes in after Golden Bantam and is like a large eared selection of Golden Bantam.
	O-3527	Whipple Early Yellow	Distinct and should be licensed.
	O-3407	Early Market	Just a strain of Cory.
	O-3409	Early Dighton	Very true to type. It is Red Cob Cory.
Cucumber	O-3735	Deltus	Distinct. Quite the same as the original Del Titus Cuke.
Cucumber	O-3734	Barteldes	Quite similar to Deltus.
	O-3739	Vaughan	A distinct type already licensed.
	O-3740	Woodruff Hybrid	Only a good White Spine type.
Cucumber	O-3738	Table XXX	A good strain of Davis Perfect.
	O-3736	Early Fortune	A good strain of White Spine.
	O-3737	Monarch Pickling	Quite the same as Snow Pickling.
Lettuce	O-3581	Early Curled	A loose leaf variety—a mixture of Grand Rapids and Curled Simpson.
Musk melon	O-3692	Golden Green Flesh	Very variable in habit of growth and type of fruit produced.
Musk melon	O-3716	Improved Perfecto	A very good melon of the Hoodoo type.
Musk melon	O-3690	Holes Best	Already on the Standard List.
Onion	O-3603	Connecticut Yellow Globe	A variable strain of Yellow Globe Danvers.
Onion	O-3600	Connecticut Large Red	A very good strain of Southport Red Globe.
Onion	O-3597	Bermuda Crystal Wax	This conforms to the type of Crystal Wax.
Parsley	O-3575	Evergreen Curled Table XXX.	Just a strain of crested or double curled parsley.
Pea	O-3637	Earliest Table Marrow	Quite like Laxtonian.
Pea	O-3638	Acquisition	A poor quality pea somewhat like Alaska.
Radish	O-3576	Summer Mixture	A true mixture, 20 Scarlet Turnip White Tip, 24 Scarlet Turnip, 9 White Icicle, 9 Chartier, 9 Off Type, 1 Olive shape.
Radish	O-3577	Japanese Mikado	A white winter radish, mention of which should have been made on the package. This sample was very uniform and good.
Squash	O-3381	Scallop Squash. Superb White.	Just a strain of White Scallop.
Squash	O-3382	Sweet Potato	Just Des Moines.
Squash	O-3386	Mixed Varieties	Just a real true mixture as stated.
Tomato	O-3333	Small Fruited Mixture	7 yellow plum and 3 small fruited mongrels of no commercial value.
Tomato	O-3332	Round Scarlet Skin	A variety very similar to Red Rock.
	O-3331	Pink Skin	This is a Livingston Globe type.
	O-3304	Essex Wonder	A roundly flattened tomato of only fair quality. The trusses are medium to large. Quite distinct.
Watermelon	O-3696	Stone Mountain	Did not mature fruits sufficiently to make a determination.
	O-3723	Earliest Sweet Table	None of the fruits matured before frost but it resembled somewhat the variety Sugar Sweet.

KELWAY & SONS

Bean	O-3782	French or Dwarf Kidney	Langport Wonder like Sutton Peerless.
Beet	O-3624	Perfect Model	21 Crosby Egyptian, 6 Half Long. 1 Egyptian, 5 Scarlet Turnip, 1 Tankard, Red Skin, 6 Scarlet Globe, 5 Detroit Dark Red, 10 Tankard beets 4 oval shape.
	O-3625	Half Long Choice Dwarf Dark.	A very true uniform strain of ½ long beet True to one type colour of foliage and colour of the skin of the roots.
Borecole	O-2918	Sponge	The wet condition of the land where this was planted was the cause of failure.
Borecole	O-2919	Crested Frost Proof	" " "
Brussels Sprouts	O-2233	Prolific Exhibition	Very variable, several types—very late maturing.
Cabbage	O-2911	Stanley	Five types.
Cucumber	O-3741	Perfect Model	*Quite variable in type.*
	O-3727	Freedom	A good yielder black spine.
Onion	O-3607	Hero	A very fine onion adapted to transplanting. Flat Danvers like, the bulbs varied in shape to a very lagre degree although mostly flat.
Onion	O-3601	Red Flag	A very fine red onion of the Prizetaker type.

MAX SCHLING SEEDSMAN INC., 618 MADISON AVE., N.Y.

Bean	O-3784	French Haricot	No germination.
Broccoli	O-3211	Italian Sprouting	Distinct from any other Broccoli.
Squash	O-	Italian Cucumber	Squash Zuccini of the wax gourd type quite distinct.

GRAHAM BROS., OTTAWA, ONTARIO

Beet	O-3622	Ideal	3 Crimson Globe, 22 Crosby Egyptian, 13 Scarlet Globe, 3 Scarlet skinned hybrids, 5 Flat Egyptian, 2 Half long rouges.
Brussels Sprouts	O-2917	Long Island Improved	A very uniform, distinct variety of merit. A decided improvement over Paris Market or Early Dwarf.
Cabbage	O-3204	Baby Head	True to type. The same as Dwarf Flat Dutch or Early Summer.
	O-2882	Delicatesse	Fairly true strain. This variety has been sold by Dupuy and Ferguson for years previous to 1923.
Cauliflower	O-2882A	Large High Grade Early Erfurt.	Just Early Dwarf Erfurt.
Cucumber	O-3743	Kirby	A dark green strain of white spine.
Corn	O-3390	Barden Wonder	A late long eared strain of Golden Bantam.
	O-3392	Whipple Early Yellow	Distinct from the other varieties. Should be licensed.
Onion	O-3595	Paris Market	A very uniform strain of an early maturing onion of the crystal wax type though earlier in maturing. The name Paris Market has been used in commerce for years.
Onion	O-3596	Teneriffe	The same as Paris Market. The name Teneriffe is merely the port of shipment from the Canary Islands.
Pepper	O-	Early Jersey Giant	No germination.
Radish	O-3578	Long Bright Scarlet	A very true strain of Chartier.
Turnip	O-3590	Dobbie Model White	Three distinct types of foliage, 7 White Globe, 5 of which are very ppor, 3 white Milan and 2 Long White. Just a mixture.

F. C. Stokes

Broccoli	O–3210	Christmas Calabria	The same as Italian Sprouting.
Cabbage	O–3022	Viking Copenhagen	The same as Copenhagen Market—not any earlier than the other strains. Golden Acre was in some instances earlier.
Cucumber	O–3742	Picklers Special	A good strain of Snow Pickling.
Musk Melon	O–3693	Abbot Peerless Pearl	A very productive main crop variety differing from the other varieties under test.
Pepper	O–2807	Panama	There is no difference between this and Sweet Upright the latter name is the original. A good early cropper.
Spinach	O–3593	Virginia Savoy	Not true to one type, leaves sorrel like. No savoying at all.
Spinach	O–3592	Giant-Leaved Noble	Similar to the Virginia Savoy supplied by this firm.
Watermelon	O–3717	Thurmond Gray	Not sufficiently matured to make a determination before frost came.

Leonard Seed Co.

Carrot	O–3615	Hutchison	Not true. Nearly all roots are true Danvers.
Corn	O–3524	Extra Early Adams	A late corn—Adams or Burlington.
Musk Melon	O–3718	Vick Early	Just a strain of Emerald Gem.

A. E. McKenzie

Corn	O–3391	Gill Early Market	A very early maturing white garden corn. Poor quality. Distinct from all other varieties.
Onion	O–3391	Mountain Danvers	A good strain of Yellow Globe Danvers.
Pea	O–2282	Duplex	The same as a novelty variety offered by Austin McAslan. Fully 95% died due to root rot.
Pepper	O–2074	Sunnybrook	No germination. This variety has been under test and is merely a tomato shaped pepper, that was introduced by W. A. Burpee.

Dunkirk Seed Co.

Watermelon	O–1437	Kolb Gem	The vines were quite uniform but the fruits that matured were very small and very much like sugar sweet, a small-sized rounded melon.

Aggler & Musser Co., Los Angeles, California

Onion	O–3605	Sweet Spanish	Very true type an old variety.
	O–3598	Crystal Wax	A very satisfactory strain of this variety.
	O–3602	Italian Red Bottle	A coarse grained elongated or bottle shaped red onion of poor quality. Very uniform for shape and colour. In all likelihood known as California Early Red. Of no use here.
Watermelon	O–3714	Klondyke	No fruits matured sufficiently to make a determination.

J. L. Haycock, Adolphustown, Ontario

Onion	O—3606	Progressive	A fairly good, but somewhat variable Yellow Globe strain 5 long type and 14 round and flat bulbs a remarkably rapid grower.

J. H. Speers Co., Ltd., Saskatoon, from A. McPherson, Box 1651, Saskatoon

Pea	O-3631	T's Unrivalled	Two types—some plants 26" tall and some 48" tall an unfixed hybrid.
Pea	O-3630	T's Main Crop	Two types half dwarf and tall very subject to root rot.

Steele Briggs Co.

Pea	O-3628	Homesteader	The vine growth leaves and pods are indistinguishable from Lincoln.

Germain Seed Co., Los Angeles, Cal.

Rhubarb		Query	The plants were very variable and produced plants of little value.

Bolgiano Seed Co., Baltimore, Md.

Tomato	O-3334	Florida Special	A mixture of types and lacks uniformity.
	O-3335	Monumental	A late maturing variety of the Greater Baltimore type, too late maturing for Ottawa.

Mr. C. B. Sayre, Agr. Exp. Sta., Geneva, N.Y.

Tomato	O-3260	John Baer Sil No.31	A fairly good strain, but rather flat-shaped fruit for John Baer.
	O-3263	New York 5-1	A fairly good yielder, but the fruits vary greatly in form.

Mr. A. F. Yeager, North Dakota Experiment Station

Tomato	O-3264	Fargo	The foliage is potato leaved in type, with fruits that resemble Earliana. The plants lack vigour.
	O-3259	Viking	This is a potato leaved variety very much like Way-ahead. The plants are weak, and produce a small crop when tied to stakes. The plants should be let grow on the ground.

Mr. Reidpath, Belleisle, N.B.

Potato	O-3665	Island Blues	This would never become a popular variety due to inferior production. The tubers are very rough and deep eyed. The skin is purple.
	O-3666	Ash Tops	A low yielding, purple, skinned variety.
	O-3667	Kidneys	This is also a low yielding, purple skinned variety. The tubers are comma shaped.

Thomas Reeves, Gibson Siding, B.C.

Potato	O-3668	No. 1 & No. 2	True Early Rose.

Rev. Pere J. Gallix, Natashquau, Saguenay Co., Que.

Potato	O-3664	Query	Very weak growing variety the tubers of which are exceedingly small. These are of no value.

JOLY DE LOTBINIERE

Potato	O-3662	Query	A purple skinned variety of no value. A very poor yielder.
Potato	O-3663	Query	The plants were all very weak, showed considerable leaf roll and mosaic.

O. PENNOYER, GRAND FORKS, B.C.

Potato	O-3654	Query	A Green Mountain-like seedling of no value, due to disease. 28 plants, mosaic out of 80 plants.

F. FATHIN, BRADUER, B.C.

Potato	O-3655	Query	The plants were mostly all diseased rendering the crop worthless.

WM. SCOTT, PARSON, B.C.

Potato	O-3652	Query	Green Mountain-like, bloom cream very much like Green Mountain. A very good strain.
Potato	O-3654	Query	Green Mountain-like—28 plants diseased (mosaic).

J. A. FAUBERT, VILLE DE LEY, R.R. 1, CHATEAUGUAY, QUEBEC

Potato	O-3656	Query	All mosaiced—two types of plants.
Potato	O-3662	Query Joly de Lotbiniere	Of no commercial value.
Potato	O-3663	Query Joly de Lotbiniere	Plants all weak, poor.
Potato	O-3664	Query	Rev. Pere Ja. Gallix, Natashquau, Saguenay Co. Too small for commercial use.
Potato	O-3665	Island Blues	Reidpath, Belleisle, N.B. Purple skin. Rough deep eyes, poor yielder.
Potato	O-3666	Ash Tops	Reidpath, Belleisle, N.B. Purple skin. Not desirable.
Potato	O-3367	Kidneys	Reidpath, Belleisle, N.B. Purple skin. Not desirable. Comma shaped.
Potato	O-3668	No. 1 and No. 2	Thos. Reeves, Gibsons Sde., B.C., Early Rose.

FRANK V. DEDRICK, ST. WILLIAMS, ONTARIO

Potato	O-3648	White Jewel	This is a decidedly different variety of potato to any of the other varieties grown. A heavy yielder. Quite free from blight.
	O-3649	Confederation	Decidedly different to any other variety grown. A heavy yielder and quite free from blight.
	O-3650	Early Norfolk	A distinct early maturing variety. Note the above three varieties were distinct from all the other varieties both in habit of growth and type of tubers hence they were found to be eligible for license.

W. E. Carle, Valley View Ranch, Perry Sidney, B.C.

Potato	O-2356	Query	The tubers reached here in badly frozen condition. The few plants that developed yielded well, but the plants and tubers were variable. Of no great value.

E. Treau de Celi, Geodetic Survey, Ottawa, Ont.

Potato	O-2354	Query	An elongated blue-skinned potato. This is of no particular value.

Wm. Macdougald, Prince Albert, Sask.

Potato	O-3660	Not under name	The plants were much like Green Mountain both in habit of growth and tuber characters.

R. E. Cumming, Agr. Rep., Gore Bay, Ont.

Potato	O-3653	For name	This potato was quite similar to Burbank. There is no difference between this and the Burbank variety.

Fred Kinsman, Exp. Station, Kentville, N.S.

Potato	O-3651	Query	This potato was sent in for test and was found to be distinct from any other variety. The foliage was dark green of medium size. The stalks were upright, with purple bloom having pale markings. The tubers resembled Rural New Yorker group or somewhat like the Rural Russett. The skin was finely netted. Seems to be resistant to late blight.

A. W. Mclelan, Surrey Centre, B.C.

Potato	O-2432	Query	The top growth was somewhat similar to Green Mountain, but flowers different.

Dr. Seager Wheeler

Potato	O-3658	Pink Eyes	Soft broad pale green foliage, poor, many of the plants are very weak. Irish Cobbler-type, fine netting entire, eyes moderately deep. Of little value.
Potato	O-3659	Query	Tubers round, blunt ended, eyes shallow, pink skin. Eyes deep, pink coloured. Of no value.

CHARLES TURNER, VERNON, B.C., P.O. BOX 432.

Potato	O-3643	Volunteer	This one produced tubers like Beauty of Hebron, the vines were very strong dark green like Irish Cobbler, but the bloom was cream.
		No. 5	Green Mountain shaped tubers very finely netted, eyes small sharp and pink. Skin golden, white bloom (3 plants mosaic) all lacked vigour; poor yielder.
		No. XII	Plants very weak an inferior yielder.
		No. XIII	A Green Mountain type; plants mosaiced badly; poor yielder.

J. C. MITCHELL, DAHINDA, SASK.

Potato	O-2429	Mitchell Excelsior	Very uniform top growth, foliage pale green. 10 plants showed evidence of leaf roll, when dug there were 97 good hills and three poor ones. This is an exceedingly good strain of *Gold Nugget*. Not any truer to one type than Gold Nugget along side.
	O-2430	Bliss Triumph	True to type—2% mosaic.
	O-2431	Query	Piebald, purple skin with large white lenticels.

MR. HALLWRIGHT, VICTORIA, B.C.

Pea	O-3639	Speed	A pea of the Alaska type. Vines spindly, pale sparse foliage.

O. A. C.

Cucumber	O-3728	Chicago Pickling	No. 1. This strain was very uniform but a weak grower with small leaves. Early maturing.
	O-3729	Chicago Pickling	No. 2. A uniform strain, strong grower leaves large, but a late cropper.
	O-3730	Chicago Pickling	No. 3. True, very uniform, foliage small. Fruits produced in clusters. Very prolific.
	O-3731	Heinz Pickling	No. 1. Very uniform plants, fruits even in shape and size and a good cropper.
	O-3732	Heinz Pickling	No. 2. Very uniform plants and fruits having black spines.

O. A. C.

Cucumber	O-3733	Heinz Pickling	No. 3. Very uniform but four days later than No. 1 & 2. An excellent cropper.
Lettuce	O-3582	Grand Rapids	A very fine strain of Grand Rapids.
Pumpkin	O-3383	Sugar Pie	Japanese very true to type.
Squash	O-3384	Mammoth Warted Hubbard	A very good strain.

EDMOND CHARTRAND, AYLMER, QUE.

Corn	3395	Query	In all likelihood a cross or selection of Golden Bantam. Varying considerably.

W. O. PORTER, MEDUCTIC, N.B.

Bean	O-3786A	Query	No germination.

J. W. Saxby, 34 Power St., Toronto 2, Ontario

Bean	O–3786	Large white—Dark eye	No germination.

Harry Lucas, Imperial, Sask.

Bean	O–3783	Query	Belongs to the Mohawk type of bean.
Corn	O–3393	Query	An early maturing Dwarf White Sweet corn distinct from any other sort.
Pea	O–3393A	Query	An unfixed hybrid some plants 60″ high while others were only 48″ high.

J. L. Foster, 1879 50th Ave. E., Vancouver, B.C.

Bean	O–3234		Quite similar to White Seeded Kentucky Wonder. Of no particular value over the above.

Olds School of Agriculture

Bean	O–3780	Yellow Eye	A pole bean resembling the Ottawa No. 1 in habit of growth, but us quite different when compared for seed characters. This is not a known variety.
	O–3781	No. 2	Wardwell Kidney Wax.

Syringa prestoniæ var. Miranda.

(Photo. by Frank T. Shutt)

ORNAMENTAL GARDENING

The area devoted to ornamental plants at the Central Experimental Farm has been put to good use in testing a large number of species and varieties. The results of these tests have been published from time to time in bulletin form, and there are now available bulletins containing information on ornamental trees and shrubs, climbers, hedge plants, roses, herbaceous perennials, and annuals, and each year the annual report contains useful information on ornamental plants.

The large number of visitors, who visit the grounds at the time when daffodils, tulips, lilacs, iris, roses, gladioli and many other kinds of flowers are in bloom, shows the great interest which is now being taken in ornamentals and the beautification of home surroundings.

New varieties are being originated in the Horticultural Division, and the following article gives some account of the best of these:—

NEW ORNAMENTAL PLANTS ORIGINATED IN THE DIVISION OF HORTICULTURE

In the report for 1925 some account was given of the breeding work with ornamental plants. Since that was published the work has been continued and several of the seedlings of different plants have been segregated and named. The names and, where possible, the descriptions are here presented:—

SYRINGA

Syringa Prestoniae is the result of a cross made in 1920 between *S. villosa* (female) and *S. reflexa* (male). The two parents are quite distinct.

S. villosa, generally called the Chinese lilac, is a vigorous shrub growing up to twenty feet high. The large leaves are rough and coarse and the flowers are pinkish-lilac and grow in medium-sized clusters. It is quite hardy and makes a handsome bush all through the season.

S. reflexa, the nodding lilac, is not very common in Canadian gardens. The leaves are somewhat like those of *S. villosa* but the plant is not so vigorous and the flowers are quite distinct. The long, drooping panicles have pink flowers closely clustered round the stem.

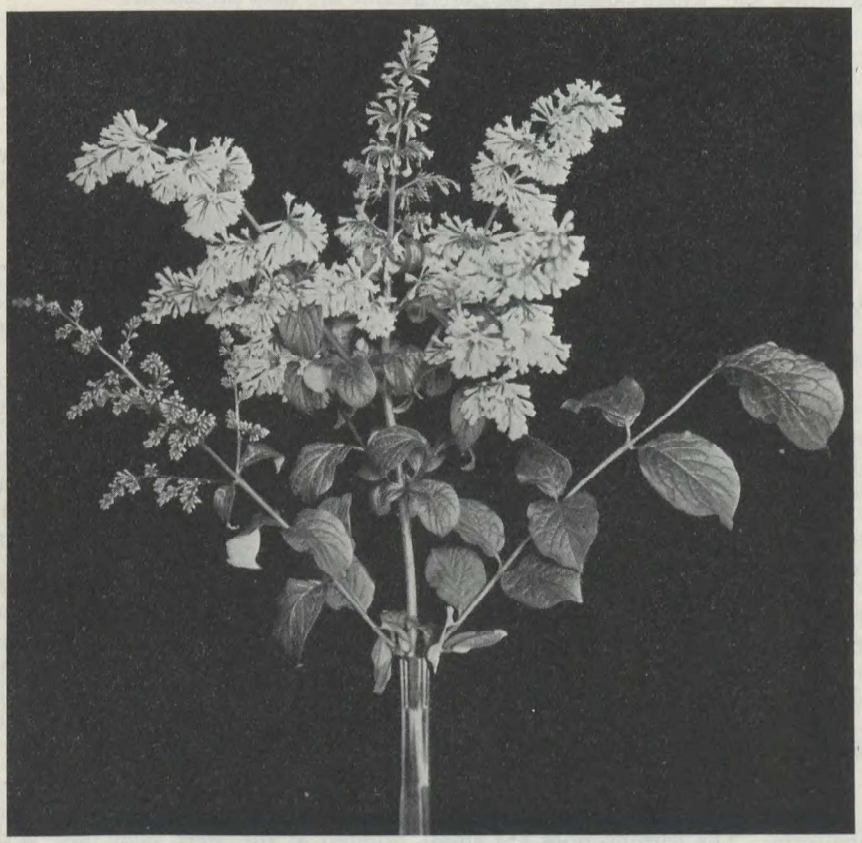
There were about two hundred and fifty seedlings produced from the cross, most of which are improvements on the parents. They show great variation in size and form of panicle, as well as in colour and shape of flower. They are profuse bloomers, vigorous growers and hardy. The odour of *S. villosa,* which is objectionable to many people, is modified and in some cases entirely absent.

As it was considered desirable to have these shrubs available as soon as possible, scions of fifty-four seedlings have been sent out to nurserymen and others who had facilities for propagating them.

On June 20 and 21, 1927, Mrs. Susan Delano McKelvey and Mr. Alfred Rehder of the Arnold Arboretum, Jamaica Plain, Mass., came to the Experimental Farm to see these plants in bloom. Mrs. McKelvey suggested the name *Prestoniae* being given to the hybrid. At the same time she chose two seedlings to describe in her book, " The Lilac," a Monograph published by The McMillan Co. Her descriptions of these two varieties are as follows (the colour names refer to Ridgeway Colour Chart):—

Isabella (Preston No. 20-14-114).—The individual flower is small in size, 7/12 inch long, with a corolla ¼ inch in diameter. The corolla-tube is slender, funnelform. The corolla-lobes are small, pointed at the apex, cucullate, with a minute hook; they expand to a right angle with the corolla-tube. The anthers

are the same size as those of *S. villosa* and inserted in the same position in the corolla-tube; they are visible in the expanded flower but inconspicuous. Their colour is in bud deep purplish vinaceous to light vinaceous-lilac (XLIV); when expanded pale vinaceous-lilac without, white with an eye of pale vinaceous-lilac (XLIV) within. The clusters are frequently a foot long and of equal breadth at their base; they terminate leafy shoots often 9 inches long. The basal subdivisions of the inflorescence are not infrequently 8 inches long, and droop for half their length while the secondary basal subdivisions show the same tendency. Except near the top of the cluster all the subdivisions are wide-spreading. For the most part the clusters appear from terminal buds, are held erect and are extremely large and showy. The rhachis, pedical and calyx are green, as in *S. villosa,* lacking the bronze colour found in the form W. T. Macoun and others. The foliage is bright green and glabrous above, pubescent and paler beneath. The winter-buds are ovoid with acute apex, the flower bud $\frac{7}{16}$ inches long more or less, the scales reddish-brown with yellower brown margins, the lower pair acute, and conspicuously keeled, the upper pairs rounded, scarcely keeled, all glabrous or minutely puberulous near margins, slightly lustrous, the margins very broken. The leaf-scar much raised, shallow shield-shaped, not conspicuous, medium size; the bundle-trace slightly curved. The capsule is oblong, obtuse, non-verrucose, $\frac{2}{3}$ to $\frac{3}{4}$ inches long, each valve ending in a short, slender tip.



Syringa prestoniae var. W. T. Macoun.
(Photo. by Frank T. Shutt)

W. T. Macoun (Preston No. 20-14-51).—In this form the individual flower is large, ⅞ inch long, with stout, funnelform corolla-tube and a wide throat. The corolla-lobes are broad, acute at apex, cucullate, with a short hook. They are held erect, never expanding to a right angle with the corolla-tube. The anthers are large, 3/16 inch long, or about the size of those of *S. villosa,* and are inserted just below the mouth. They are visible in the expanded flower but not conspicuous because of the position of the corolla-lobes. The colour of the flowers is in bud vinaceous-purple turning to tourmaline pink to laelia pink (XXXVIII); when expanded, the tube laelia pink, the lobes pale laelia pink without, white with shadings of pale laelia pink (XXXVIII) within. The clusters, frequently 9 inches long and 7 inches broad, are produced on leafy shoots 7 to 8 inches long. Their basal subdivisions are often 5 inches long. The clusters taper from a broad base to a narrow top and droop slightly for a part of their length. They appear frequently in threes, from one terminal and two opposite lateral buds on the same branchlet, the rhachis, pedicel and calyx are tinged dark indian red (XXVII); the rhachis is slightly puberulous, but not the calyx or pedicel. The winter-buds are ovoid with acute apex, the flower bud 7/16 inch long more or less, the scales reddish brown with yellower brown margins, acute or rounded, the lower pair conspicuously keeled, the upper pairs less so, glabrous or minutely puberulous, slightly lustrous. The leaf-scar slightly raised, shallow shield-shaped, inconspicuous, medium size; the bundle-trace only slightly curved. The capsule is oblong, obtuse, non-verrucose, ⅔ inch long, each valve ending in a short, slender tip.

The names for the other seedlings have been chosen from those of Shakespeare's heroines. The names are listed even though the plant has not yet been described.

Adriana (No. 20-14-02):

Alice (No. 20-14-140).—Flower panicle 9½ inches long, 6 inches wide, tall cone-shape with drooping tips. Bud tourmaline pink to pale lilac. Expanded bloom pale lilac to purplish lilac within, pale lilac without. Tube long, narrow, flatish at the throat, lobes horizontal, tips reflexed, 9/16 inch long and ¼ inch across.

Audrey (No. 20-14-195).—Flower panicle 9 inches long and 9 inches wide, with long lower branches with drooping tips. Bud daphne red to laelia pink. Expanded bloom purplish lilac fading to almost white within, pale laelia pink without. Tube long, funnel form, broadening at the throat, lobes large, roundish, reflexed, ½ inch long and ⅜ inch across.

Beatrice (No. 20-14-150):

Bianca (No. 20-14-08):

Blanch (No. 20-14-156).—Flower panicle 10¼ inches long, 9½ inches wide, very close and bunchy. Bud light perilla purple to laelia pink. Expanded bloom white tinged with lilac at throat within; purplish lilac without. Tube long, bulging at throat, lobes large, expanding, horizontal, with reflexed tips, ⅝ inch long and ⅜ inch across.

Cassandra (No. 20-14-135):

Celia (No. 20-14-176):

Charmian (No. 20-14-162).—Flower panicle 9¼ inches long, 9¼ inches wide, open, loose, widest at two-thirds of height, tapering to point at tips, which are inclined to droop. Bud perilla purple to purplish lilac. Expanded Argyle purple to purplish lilac within; purplish lilac without. Tube long funnel, broader at throat, lobes horizontal, tips reflexed.

Constance (No. 20-14-168):

Cordelia (No. 20-14-157):

Cressida (No. 20-14-164):

Desdemona (No. 20-14-179).—Flower panicle 6¾ inches long, 7¼ inches wide, medium loose, broad at base, tapering to point, tips drooping. Bud eupatorium purple to laelia pink. Expanded palest light pinkish lilac within; pale laelia pink without. Tube long, narrow, lobe tips reflexed, $\frac{9}{16}$ inch long, $\frac{5}{16}$ inch wide.

Diana (No. 20-03-01).—In this seedling *S. reflexa* is the female parent and *S. villosa* the male.

Elinor (No. 20-14-172).—Flower panicle 7½ inches long, 5¾ inches wide, long cone-shaped. Bud vernonia purple to laelia pink. Expanded very pale lobelia violet within; pale lilac without. Tube long, narrow, very little wider at throat, lobes small, horizontal, ½ inch long, $\frac{5}{16}$ inch across.

Emilia (No. 20-14-13):

Francisca (No. 20-14-247):

Gertrude (No. 20-14-197):

Helena (No. 20-14-06):

Hermia (No. 20-15-20):

Hero (No. 20-14-204):

Imogen (No. 20-14-205):

Jacquenetta (No. 20-14-18):

Jessica (No. 20-14-22):

Julia (No. 20-14-11):

Juliet (No. 20-14-241).—Flower panicle 6½ inches long, 5 inches wide, long cone shaped, widest a little above centre. Bud vinaceous purple to purplish lilac. Expanded purplish lilac within, laelia pink without. Tube flattish, with distinct bulge at throat, lobes opening, horizontal, tips reflexed, ½ inch long, $\frac{5}{16}$ inch across.

Katherina (No. 20-14-34):

Lavinia (No. 20-14-26):

Lucetta (No. 20-14-54).—Flower panicle, 8¼ inches long, 9½ inches wide, broad at base, tapering to point with long drooping tips. Bud light perilla to purplish lilac. Expanded pale lilac within; pale lilac to purplish lilac without. Tube narrow at base with distinctly broader throat, lobes expanding horizontal, tips slightly reflexed, $\frac{5}{8}$ inch long, $\frac{3}{8}$ inch across.

Lucinia (No. 20-14-66):

Margaret (No. 20-14-221).—Flower panicles 8½ inches long, 7 inches wide, lower side branches very long, widest at three-quarters of height, short tip. Bud laelia pink to light pinkish lilac. Expanded almost white within, light pinkish lilac without. Tube long funnel-shape, broadening gradually towards the throat, lobe tips reflexed, $\frac{5}{8}$ inch long, $\frac{5}{16}$ inch across.

Mariana (No. 20-14-78):

Miranda (No. 20-14-38).—Flower panicle 10½ inches long, 9 inches wide, broad at base, tapering to a point; two laterals bloom later; tips inclined to droop. Bud daphne pink to pale Persian lilac. Expanded bloom white with pale Lobelia violet shading in tube within; pale Persian lilac to pale laelia pink without. Tube long, narrow, lobes $\frac{5}{8}$ inch long, $\frac{3}{8}$ inch across.

Nerissa (No. 20-14-49).—Flower panicle 8½ inches long, 8 inches wide, broad at base, tapering to point, drooping tips. Bud tourmaline pink to pale laelia pink. Expanded very pale vinaceous fawn, tinged with palest mauve within; pale vinaceous fawn tinged with palest mauve without. Tube long, narrow, broader at mouth, lobes deeply reflexed with hooked tips, ⅜ inch long, 5/16 inch across.

Octavia (No. 20-14-93).—Flower panicles 8 inches long, 5½ inches wide, with upright tips. Bud vinaceous purple to tourmaline pink. Expanded very light pinkish lilac within, laelia pink without. Tube long, narrow, broadening at throat, lobes with reflexed tips.

Olivia (No. 20-14-64).—Flower panicles 10 inches long, 7½ inches wide, broadest at ⅔ of height, broad tips. Bud bishop's violet to purplish lilac. Expanded pale laelia pink within, laelia pink without. Tube funnel shape, distinctly broader at throat, lobes broad, acute, seldom expanding to right angles, 9/16 inch long, ¼ inch across.

Ophelia (No. 20-14-72):

Patience (No. 20-14-236).—Flower panicles 10½ inches long, 10½ inches wide, large, broadest a little above centre, tips upright. Bud vinaceous purple to purplish lilac. Expanded purplish lilac within, fading to very pale lilac without. Tube shortish, wider at the throat, lobes opening horizontal, medium small, 7/16 inch long, 5/16 inch across.

Paulina (No. 20-14-83).—Flower panicles 7½ inches long, 7½ inches wide, bunchy, almost all the same length. Bud laelia pink to pale lilac. Expanded very pale, almost white, tinged with pale lilac within; light pinkish lilac without Tube long, narrow, widening at throat. Lobes only horizontal when widely expanded.

Perdita (No. 20-14-50):

Phebe (No. 20-14-240):

Portia (No. 20-14-56):

Regan (No. 20-14-251).—Flower panicles 6½ inches long, 3¾ inches wide, medium narrow based cone tips drooping. Bud vinaceous purple to laelia pink. Expanded bloom very pale, almost white, tinged with lilac at throat within; pale lilac without. Tube long funnel, narrowed at base, lobes expanding horizontal, 9/16 inch long, ⅜ inch across.

Rosalind (No. 20-14-233).—Flower panicles 14 inches long, 16 inches wide. The two large lateral branches bloom later and grow longer than centre one. Bud laelia pink to light pinkish lilac, expanded very light pinkish lilac to almost white within, light pinkish lilac without. Tube long, narrow, wider at throat; lobes opening horizontal, 9/16 inch long, ⅜ inch across.

Silvia (No. 20-14-99):

Tamora (No. 20-14-124):

Timandra (No. 20-14-111):

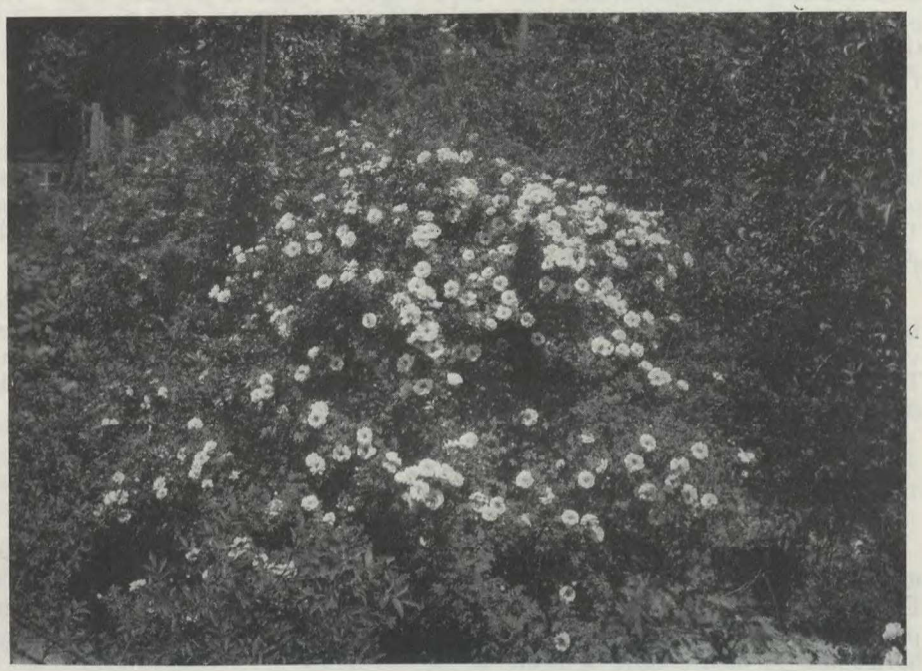
Titania (No. 20-14-115):

Ursula (No. 20-14-214).—Flower panicles 11½ inches long, 7 inches wide, tall cone, widest at two-thirds of height. Bud daphne pink to light pinkish lilac. Expanded white faintly tinged with pale lilac within; light pinkish lilac without. Tube long, funnel-shape, widening evenly towards throat, lobes large, opening horizontal, ⅜ inch long, 7/16 inch across.

Valeria (No. 20-14-149):

Viola (No. 20-14-180).—Flower panicles 9½ inches long, 9½ inches wide, broad at base, tapering to point, widely branched, with drooping tips. Bud light perilla purple to purplish lilac; expanded purplish lilac with white hook within; light pinkish lilac without fading to pale lilac. Tube long, flattish, bulging at throat, lobes expanding horizontal, ½ inch long, $\frac{5}{16}$ inch across.

Virgilia (No. 20-14-211).—Flower panicles 8½ inches long, 9 inches wide. Shape varies from broad bunch to shortish cone, tips drooping. Bud Tourmaline pink to pale laelia pink; expanded pale lilac within, very light pinkish lilac without. Tube long, flattish, lobes opening horizontal, later deeply reflexed, ½ inch long, $\frac{5}{16}$ inch across.



Rose harisonii seedling Orinda.
(Photo. by Frank T. Shutt)

ROSA

In the work with roses the object in view has been to raise varieties that would be hardier than those generally obtainable. To obtain these, hardy species were chosen as parents and crosses were made between *R. rugosa* and *R. rubrifolia*. It was found that when *R. rugosa* was used as the female parent the seedlings all had green leaves, but if *R. rubrifolia*, the red-leaved rose, was the female the seedlings had reddish leaves. The reddish-leaved seedlings have been named *R. rubrosa* variety Carmenetta.

This is a large shrub, growing eight to ten feet high and as much through, extremely hardy. The general colour is reddish and the leaflets are large, like those of *rugosa* and are red overlaid with green. The flowers are in clusters, about 1½ inches in diameter and pale pink in colour. It is useful as a shrub but would be out of place in a rose garden.

A large number of seeds of *R. harisonii* have been sown each year but, as is usual with the seeds of this rose, very few germinated. Eight seedlings have been named and are quite ornamental when in bloom and extremely hardy.

R. harisonii var. Ardelia (No. 22-26-03).—Fine bush, growing 5 feet, 6 inches high. Bloom deep cream, semi-double.

R. harisonii var. Antenor (No. 22-26-04).—Height 3 feet, 6 inches. Bloom on first opening is tinged with apricot but rapidly fades to cream, double.

R. harisonii var. Lucasia (No. 22-26-05).—A dwarfer growing plant, being less than 3 feet. Small, yellow flowers, single.

R. harisonii var. Orinda (No. 22-26-11).—This is a vigorous grower, making a fine, large bush nearly six feet tall and holding its leaves until severe frost. The flowers are of good size, deep cream and semi-double.

R. harisonii var. Regina (No. 22-26-08).—This is a medium grower; being 4 feet tall. Flowers flushed pinkish on opening, quickly fading to cream, single.

R. harisonii var. Rosania (No. 22-26-06).—A good shaped bush, about 4 feet tall, holding its foliage until late in the season. Flowers pale cream with conspicuous golden anthers, semi-double.

R. harisonii var. Silvander (No. 22-26-02).—A dwarf bush growing about 2 feet 6 inches high. Flowers yellow, single.

R. harisonii var. Valeria (No. 22-26-10).—A vigorous plant growing 5 feet tall. Flower medium size, deep cream, single.

Two other seedlings that may be useful for hedges or small shrubs are of the Scotch rose class.

R. var. Huron (No. 23-08-01).—*R. cinnamomea,* female, crossed with the Scotch rose Pythagoras, forms a small compact bush, 2½ feet tall. Flowers white, flushed pale pink, semi-double.

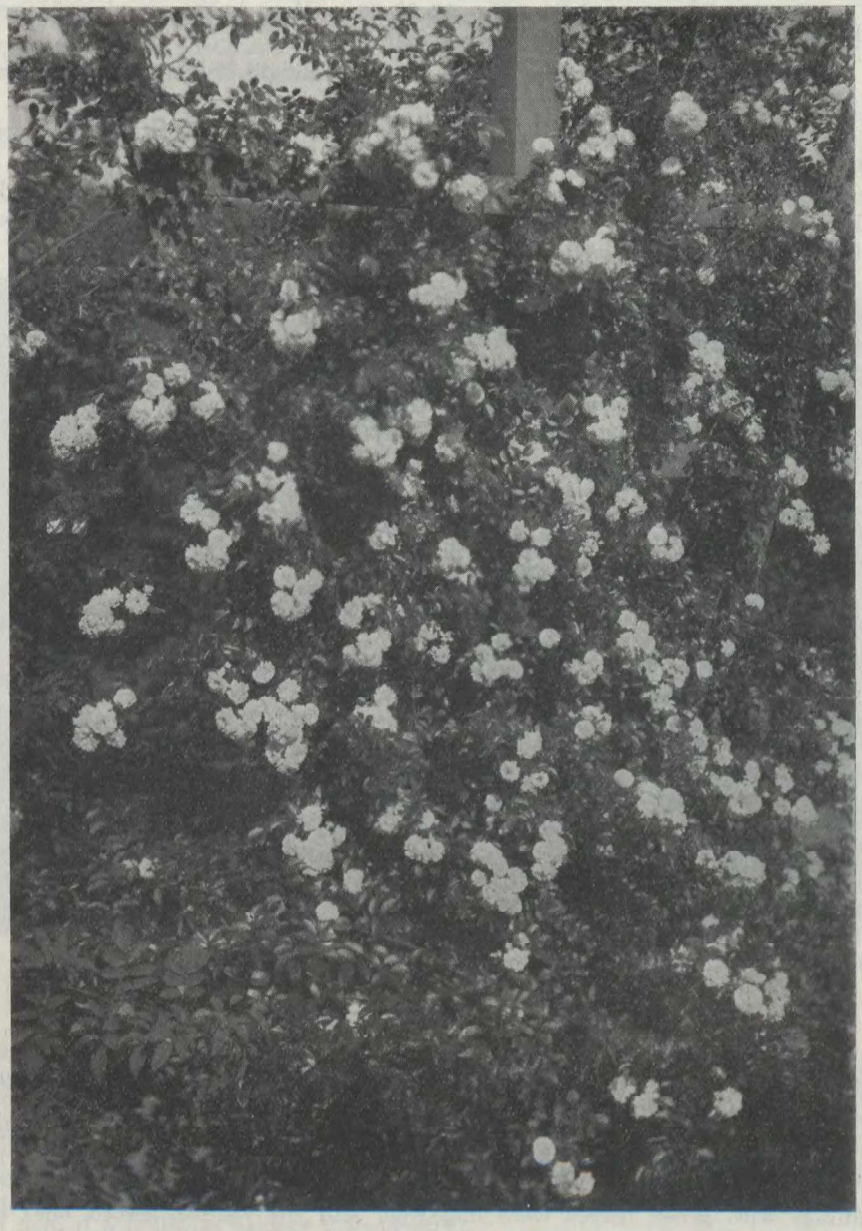
R. var. Iroquois (No. 23-08-02).—Sister seedling to Huron, makes a rather larger bush and the flowers are deep mauvish-pink, opening out to show the yellow anthers. The colour is not a particularly attractive shade, but as deep coloured roses in this class are rare it may prove useful.

All these roses are quite hardy at Ottawa without any protection.

R. helenae var. Patricia (No. 23-19-02).—This is an open fertilized seedling of *Rosa helenae.* A vigorous climber with flowers in clusters well spread over the branches. Flower medium size, double, white, with conspicuous golden anthers, fragrant. For the last two years this rose has grown and flowered well. It has been protected in the same way as other climbers during the winter and has proved as hardy as any.

PYRUS

The chief aim in the work with flowering apples was to obtain more varieties of shrubs with reddish foliage and flowers. *P. malus nanus var. niedzwetzkyana* was chosen as one parent as it has reddish-bronze leaves, deep rose flowers and large. dark maroon fruits. It was crossed with different forms of hardy crab-apples. A number of open fertilized seeds were also sown and some of these had, no doubt, crossed with a hybrid crabapple that was growing nearby. The seedlings with green leaves were discarded and the reddish-leaved ones only were kept. These vary considerably in colour and size of foliage, fruit and flowers and in habit of growth. In fall they all have brilliant red foliage and attractive fruits. The names given to these seedlings have been chosen from those of Canadian Lakes. The fruit of all the varieties is small and crab-like except that of Okanagan.



Rose helenae var. Patricia.

(Photo. by Frank T. Shutt)

Amisk (No. 20-07-69).—Pyrus malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage bronze; flowers in bud deep pink; expanded red, fading to pink; fruit cone-shaped, bright red.

Arrow (No. 20-07-12).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage deep greenish-bronze; flowers in bud amaranth purple; expanded pomegranate purple; fruit small, dark red crab, slightly conic.

Babine (No. 20-05-04).—P. malus pumila var. niedzwetzkyana female x *P. baccata var. jenensis* (Aboretum No. 2776). Foliage reddish.

Cowichan (No. 20-07-39).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage bronze, flower in bud spinel red; expanded thulite pink, fading rapidly to cameo pink; fruit bright crimson crabs.

Chilko (No. 20-07-99).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage reddish; flowers large, pink; fruit bright red, medium size.

Dauphin (No. 20-07-54).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage bronze in spring changing to bright red in fall; fruit bright red, medium size.

Erie (No. 20-07-05).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. This is a well-branched, open shrub covered with bloom over all its branches. Foliage greenish-bronze; flower in bud pomegranate purple; expanded tyrian rose, fading with age; fruit deep crimson crab.

Geneva (No. 20-07-117).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage bright red in spring, deepening in colour in fall. This shrub has never bloomed.

Kingsmere (No. 20-04-02).—P. malus var. toringo (Arboretum No. 6037) female x *P. malus pumila var. niedzwetzkyana* male. Foliage bright rich red; flower in bud deep red; expanded deep pink, fading to pale pink, large; fruit dull red, medium to small.

Manito (No. 20-07-66).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage glossy, deep bronze; flowers very few; fruit, one only, light crimson.

Meach (No. 20-04-01).—P. malus toringo (Arboretum No. 6037) female x *P. malus pumila var. niedzwetzkyana* male. Foliage bronze; flowers arranged in clusters round the branches; bud amaranth purple; expanded flower a paler shade; fruit bright red crab.

Muskoka (No. 20-05-07).—P. malus pumila var. niedzwetzkyana female x *P. baccata var. jenensis* (Arboretum No. 2776). Foliage bright red; flower bud bright red; expanded pink, fading rapidly; fruit deep red, medium size, slightly conical in shape.

Nipissing (No. 20-05-05).—P. malus pumila var. niedzwetzkyana female x *P. baccata var. jenensis* (Arboretum No. 2776) male. Foliage bright red; very little bloom.

Okanagan (No. 20-07-94).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage very large, bronze-red in spring, turning to crimson in fall, hanging on very late in the season; flowers few, hidden by the leaves; fruit, cone-shaped, dark crimson, larger than that of *P. niedzwetzkyana.*

Ponass (No. 20-07-97).—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage deep reddish-bronze; leaves large.

Rosseau (No. 20-07-49):—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage bronze-green in spring, turning to bright red in fall. Fruit hangs on tree late in fall; bright red, small crab.

Scugog (No. 20-07-52):—P malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage reddish-bronze.

Simcoe (No. 20-02-05):—P. baccata female x *P. malus pumila var. niedzwetzkyana* male. Foliage reddish-bronze; flower in bud red and large; expanded large, deep rose; fruit very attractive, bright scarlet.

Sissipuk (No. 20-06-06):—P. malus pumila var. niedzwetzkyana x *P. baccata* (Arboretum No. 1160). This plant is very late and the leaves do not begin to grow until the other trees are fully out. Foliage deep red; flower in bud pomegranate purple; expanded rose colour; fruit very small, dull red crab.

Slocan (No. 20-07-70):—P. malus pumila var. niedzwetzkyana, open fertilized seedling. Foliage deep red.

Timiskaming (No. 20-06-01):—P. malus pumila var. niedzwetzkyana female x *P. baccata* (Aboretum No. 1160). Foliage reddish bronze; flower in bud bright red; expanded deep rose. Fruit small crab, dull red, very persistent.

Wabiskaw (No. 20-05-06):—P. malus pumila var. niedzwetzkyana female x *P. malus baccata var. jenensis* (Arboretum No. 2776) male.

IRIS

Although a number of crosses have been made amongst the tall bearded group of irises and many beautiful seedlings have flowered, none has been considered worth sending out. Amongst the beardless section some interesting seedlings have been obtained.

I. ochroleuca, a tall growing, late blooming, creamy-white species with yellow patch on the falls, was crossed with *I. aurea,* a tall deep yellow species. The seedlings resemble *ochroleuca,* but in some of them the yellow patch is larger and the falls broader. This cross was originally made by Sir Michael Foster and the name *I. ochaurea* given to it. The best of the Ottawa seedlings will be given variety names later.

In the Siberian group crossing was done with the desire to obtain a tall plant like some of the best sibiricas, with the white with golden blotch flowers of orientalis Snow Queen. *I. sibirica var. maxima,* a tall dark blue, was chosen as one parent and *I. orientalis var. Snow Queen* as the other. The cross was made successfully both ways and ninety-two seedlings were obtained. These were all blue though the depth of colour varied a great deal. Several of these were considered an improvement on existing varieties and have been named. A large number of open-fertilized seeds of these ninety-two plants were sown and about two thousand seedlings grown. A number of these were white, like Snow Queen in colour and texture, but varied in height, shape of flower and breadth of petals. The most interesting was No. 20-17-481 which had the colouring of Snow Queen with the drooping falls of a sibirica. Several other of the white flowering seedlings have been saved for further testing and seedlings of them are being grown. Some of the most beautiful of the blue ones have been named and are being propagated. The names have been chosen from those of Canadian rivers.

Abitibi (No. 20-01-44).—Iris sibirica var. maxima (female) x *I. orientalis var. Snow Queen* (male). Large, pale blue with lighter stigma, with conspicuous golden lacing on the falls.

Chaudière (No. 20-01-35):—Iris sibirica var. maxima (female) x *I. orientalis* var. Snow Queen (male). Similar to Abitibi.

China Blue: Named by Viscountess Byng. Light blue.

Gatineau (No. 20-01-02).—I. sibirica var. maxima (female) x *I. orientalis* var. Snow Queen (Male). Flowers large, pale blue with conspicuous gold lacing on the falls; medium height.

Kootenay (No. 20-01-36).—I. sibirica var. maxima (female) x *I. orientalis* var. Snow Queen (male). Similar to Gatineau.

Madawaska (No. 20-02-22):—I. orientalis var. Snow Queen (female) x *I. sibirica var. maxima* male. A medium dark blue.

Mattawin (No. 22-06-02).—(I. sibirica var. maxima x *I. orientalis* var. Snow Queen) female x Snow Queen male. Flowers medium shade of blue with faint white line around margin of falls; conspicuous gold lacing.

Nipigon (No. 24-19-70).—Unmarked seedling of 20-01 or 20-02, open fertilized. Flower rich blue with prominent white markings on the falls, changing to gold on the haft, with dark reticulations. The falls are broad and inclined to be horizontal rather than drooping.

Ottawa.—Named by Viscountess Byng. This seedling was given an Award of Merit by the Royal Horticultural Society, London, on June 5, 1928. Flowers very deep blue with big white marking on falls.

Pembina (No. 24-17-256).—I. sibirica var. maxima x *I. orientalis* var. Snow Queen seedling, open fertilized. Flower large, dark blue, standards long and broad; falls broad, rounded and drooping, with very distinct white blotch.

Rideau (No. 20-01-05).—I. sibirica var. maxima female x *I. orientalis* var. Snow Queen. Flower large, pale blue. Resembles Gatineau but is a taller plant.

Richelieu (No. 22-06-12):—(I. orientalis var. Snow Queen x *I. sibirica var. maxima)* female x *I. orientalis* var. Snow Queen male. Flower white like Snow Queen.

Lilium regale in the rose garden, C.E.F.
(Photo. by Frank T. Shutt)

LILIUM

Lilium Ottawa hybrids (No. 22-05).—Lilium davidi (female) x *L. willmottiae* (male). These are vigorous plants growing five to six feet in light sandy soil, with forty to sixty blooms on a stem. Flowers are grenadine red spotted with dark brown. Segments reflexed. As they are different seedlings they show considerable variation.

Lilium tigrimax (No. 21-43-04).—L. tigrinum (female) x *L. maximowiczii* (male). A vigorous plant, covered with fine hairs. Flowers are smaller than in *L. tigrinum* and more brilliant in colour and with smaller dark spots. The pedicels are longer also so that the general appearance of the plant is different.

L. tigrinum (female) has also been successfully crossed with *L. willmottiae,* but the seedlings are not considered of any special value for the garden.

L. testaceum (female) x *L. candidum:* Three seedlings bloomed from this cross. One was pure white with golden anthers, but was shaped like *testaceum.* The others resembled *L. candidum* in shape but had the reddish anthers of *L. testaceum.*

L. testaceum x *L. chalcedonicum* (No. 21-06): There was only one seedling of this cross that grew to blooming size. Flowers deep buff with strongly reflexed segments.

Amongst some open fertilized seedlings of *L. willmottiae* No. 22-11 appeared two natural hybrids, one of which seems to be worth propagating. It grows from three to four feet tall and the flowers are clustered around the top of the stem. They are large, open bell-shaped, with reflexed tips, and face outwards. Colour orange chrome (Ridgeway) with small brown spots.

Another natural hybrid appeared amongst some seedlings of *L. croceum* No. 23-17. This shows characters of *L. tenuifolium* and is probably a cross with this species. It is a stronger growing plant with thicker stems and broader leaves. The flowers are drooping, with reflexed segments.

AQUILEGIA

The crosses between the native *A. canadensis* and *A. sibirica,* which we have found is the correct name for the early flowering blue that we had under the name of *A. oxysepala,* are still being grown and self-fertilized seed of the best seedlings being saved. It has not been possible to do much special work with them as the aquilegia borer has destroyed so many of the plants.

EXPERIMENTS IN THE GREENHOUSES.

Experiments in the greenhouses are continued from year to year, and as in the previous year, the chief plants grown were: carnation and sweet pea novelties in comparison with older varieties; antirrhinum varieties, mainly of the pink shades; and cinerarias, cyclamens, geraniums, primulas, tulips, and daffodils. There is also the large collection of varieties of chrysanthemums, of which some of the best sorts have been originated in the Horticultural Division. The many thousands of persons who visit the greenhouses when the chrysanthemums are in bloom show the great interest there is in this beautiful and varied flower.

The breeding of cucumbers, tomatoes, and head lettuce especially suited to forcing in greenhouses was continued in 1928, and progress made. Much breeding work was also done with varieties for outside.

Many fruit trees and bushes grown in pots are brought into bloom in the greenhouses where cross-breeding is carried on at a time when it cannot be done outside.

NEW CHRYSANTHEMUMS ORIGINATED IN THE HORTICULTURAL DIVISION

Many new seedling chrysanthemums are raised in the greenhouses to obtain, if possible, better varieties than those already on the market. These are compared each year with the hundreds of other varieties already named, the whole making a fine exhibition of flowers, which attracts thousands of visitors to the greenhouses in November when they are at their best. The new sorts which show outstanding merit are named and multiplied for further test.

Following are the varieties which were named in 1928:—

Austin Chamberlain.—Seedling of Private Merlie Hoy, originated 1927. Semi-double quilled. Tip of quill brown, remainder dull yellow, centre dull yellow. An odd-looking variety.

Cathrine Motherwell.—Seedling of Pomona, originated 1927. Anemone flowered. Pure white with cream centre. An improvement over Pomona. A fine variety.

Ivy Chamberlain.—Seedling of Portia, originated 1927. Single. Colour vivid crimson with yellow anthers. Petals rather narrow and spreading. A striking variety.

Lady Clark.—Seedling of Fantasia, originated 1927. Large single with double row of petals. Colour old rose, white at the base. A very attractive variety.

Marjorie Broderick.—Seedling of Louis Mayo, originated 1926. Large single with three rows of petals. Colour bronze with carmine tint on upper half of petals running to yellow about base. A good variety.

Sir Wm. Clark.—A seedling of Marie Adelaide, originated in 1927. Single. Colour yellowish tan and yellow.

Susan Liesching.—Seedling of Ethel, originated 1927. Single or semi-double. Colour flesh pink with yellow anthers. An attractive flower.

SWEET PEA GREENHOUSE EXPERIMENT

For three winters in succession sweet peas have been grown in the same greenhouse of the Horticultural Division at the Central Experimntal Farm. A report of the two first crops was published in the annual reports for 1926 and 1927. In this Report the results for the 1927-28 crop are given and, in addition, the average number of stems cut per plant for the past two years. The 1925-26 crop was not included in the average, as the plants had to be pulled before the season was over.

In the experiment for 1927-28 fifty-one different lots of sweet peas under names were grown in the main greenhouse. The seed was sown in two and one-half inch pots on November 7, 1927, and the plants set out in the bed on December 22, 1927. The soil was made of rotted sod and manure. Plants were set six inches apart in rows twenty-five inches apart. They were supported with binder twine. The average night temperature was 50° F. The number of plants set out was five hundred and fifty-two and the area occupied five hundred and seventy-six square feet. The plants were pulled on May 29, 1928, at which time they had reached a height of 12 feet and were still vigorous. The total number of stems cut from all varieties was 29,430, or 51 stems per square foot.

It will be noticed that the yield from the 1927-28 crop was not nearly as large as that from the 1926-27 one. This was due mainly to the plants being about a month later in coming into bloom in 1928 than in 1927. Dropping of buds occurs more in some years than others, depending much on climatic conditions.

RESULTS OF GREENHOUSE TEST OF SWEET PEAS

Name of variety and source of seed	Number of plants	Date of first bloom	Date of first cut	Date of last cut	Number of cuttings	Average number of flowers per stem first cutting	Average number of flowers per stem all cuttings	Average length of stem first cuttings	Average length of stem all cuttings	Number of stems cut 1st two weeks from time earliest variety was cut	Number of stems cut 1st month from time earliest variety was cut	Total number of stems cut	Average number of stems per plant 1926-27	Average number of stems per plant 1927-28	Average number of stems per plant 2 crops 1926-27, 1927-28
		1928	1928	1928				in.	in.						
Rose Queen (B) mauve pink	28	Mar. 19	Mar. 28	May 29	24	2	3	15	17	244	759	1,731	150	62	106
Mrs. W. G. Harding (B) light mauve-lavender	8	" 19	" 28	" 29	23	2	3	14	16	87	228	545	143	68	105
Harmony (B) mauve-lavender	8	" 19	" 30	" 29	23	2	3	14	16	59	136	359	153	45	99
Ey. Lavender King (B) mauve-lavender	12	" 21	" 30	" 29	21	2	3	14	16	85	261	638	134	53	93
Sunburst (B) pale pink, suffused white	12	" 20	" 28	" 29	23	3	3	16	16	118	410	1,104	.....	92	.....
Fordhook Pink and White (B) white tinged mauve pink	8	" 23	April 6	" 29	19	2	3	15	15	42	167	402	134	50	92
Ey.-flg. Yarrawa (B) white-suffused mauve pink	12	" 30	" 3	" 29	19	3	4	18	17	110	415	932	101	78	89
Peach Blossom (B) mauve pink	8	" 9	Mar. 12	" 29	22	2	3	10	15	110	228	714	.....	89	.....
Sunburst Imp. (B) pale pink, suffused white	4	" 24	" 28	" 29	23	2	3	17	16	58	142	312	99	78	88
Eldorado (S) orange salmon	12	" 17	" 19	" 29	23	2	3	12	17	150	304	774	108	64	86
Illumination (B) rosy red	8	" 20	April 6	" 29	19	2	3	16	16	35	132	387	123	48	85
Quaker Lady (B) light mauve-lavender	6	" 28	Mar. 31	" 29	19	2	3	12	13	41	109	270	125	45	85
Zvolanek Rose (S) mauve pink	12	" 27	April 4	" 29	22	2	3	12	15	53	319	418	116	52	84
Jeanne Mamitsch (S) mauve-pink, suffused white	12	" 20	" 28	" 29	23	2	3	15	17	109	250	572	121	48	84
Hercules (S in 1927, B in 1928) mauve-pink suffused white	12	" 30	April 4	" 29	21	2	3	14	15	48	160	552	121	46	83
Penrose (B) rose, suffused lighter shades	8	" 30	" 3	" 29	19	2	2	14	14	52	126	357	122	45	83
Ey. Bluebird (B) bluish-purple	8	" 19	Mar. 28	" 29	23	2	3	14	16	43	101	262	127	33	80
Pink Profusion (B) mauve-pink suffused white	8	" 27	" 31	" 29	21	2	3	17	15	77	199	524	95	65	80
Torch (S) deep rose	12	April 4	April 6	" 29	20	2	3	14	16	34	146	498	120	41	80
Blue Jacket (B) violet and bluish-purple	4	Mar. 21	Mar. 30	" 29	21	2	3	15	15	25	91	221	104	55	79
Ey. Enchantress (B) mauve-pink	12	" 8	" 12	" 29	26	2	3	12	17	248	467	944	.....	79	.....
Ey. Princess (B) light mauve-lavender	4	" 21	" 30	" 29	23	2	3	16	17	34	81	106	133	26	79

Glorious (B) rosy-purple	16	" 21	" 28	" 29	24	2	3	14	14	176	334	712	113	44	78
Ey. Giant Rose (B) mauve-pink	8	" 27	" 31	" 29	21	2	3	13	15	77	200	619	.....	77	.....
Fire King (B) Rosy red	12	" 24	" 28	" 29	21	2	3	14	16	126	326	764	88	64	76
Eldorado (B) orange salmon	4	" 21	" 28	" 29	24	2	2	16½	17	35	102	299	.....	75	.....
Mrs. Kerr (B) salmon pink, suffused white	8	" 24	" 28	" 29	20	2	3	14	15	51	139	360	104	47	75
Miss Louise Gude (B) mauve-pink, suffused white	12	" 20	" 28	" 29	23	2	3	12	15	127	350	901	.....	75	.....
Sweet Lavender (B) Light mauve-lavender	8	" 19	" 28	" 29	20	2	3	13	15	83	210	589	.....	74	.....
Columbia (B) rosy pink and white	12	" 21	April 4	" 29	21	2	3	14	14	31	116	438	112	36	74
Cheerful (B) salmon-cerise suffused white	6	" 23	" 6	" 29	18	2	3	14	14	35	110	295	97	49	73
Imp. Snowstorm (B) white	10	" 28	" 31	" 29	20	3	3	16	16	60	197	585	88	58	73
Milkmaid (B) white	12	" 23	" 28	" 29	23	2	3	15	16	89	198	435	103	36	69
Grenadier (B) deep rosy red	20	" 18	" 24	" 29	22	2	3	17	18	148	337	838	94	42	68
Jeanne Mamitsch (B) mauve-pink, suffused white	12	" 23	" 28	" 29	21	2	3	14	16	124	337	812	.....	67	.....
Flamingo (B) salmon and rosy red	12	" 23	" 28	" 29	22	2	3	14	16	102	259	611	79	51	65
Zvolanek Blue (S) bluish-purple	20	" 19	" 28	" 29	25	2	3	17	16	96	447	536	83	45	64
Ey. Canary Bird (B) very pale yellow	8	" 21	" 31	" 29	20	2	3	15	17	37	128	277	93	35	64
Glitters (B) rosy red	12	" 28	April 3	" 29	19	2	3	14	13	59	135	463	87	39	63
Sunlight (B) salmon-pink suffused white	12	" 19	Mar. 26	" 29	24	2	4	14	15	109	316	610	69	51	60
Gilda Gray (B) salmon and pink	12	" 24	" 28	" 29	21	2	3	12	16	105	234	699	.....	58	.....
Zvolanek Rose (B) mauve-pink suffused white	12	" 23	April 4	" 29	23	2	3	15	16	84	227	693	.....	58	.....
Ey. Loveliness (B) mauve-pink and white	12	" 7	Mar. 12	" 29	26	2	3	11	15	161	329	684	.....	57	.....
Superior Pink (B) deep lively rose	12	" 22	" 28	" 29	23	2	3	14	16	112	286	644	.....	54	.....
Mrs. Calvin Coolidge (B) rosy red and salmon suffused white	12	" 21	" 30	" 29	19	3	4	13	15	64	213	648	.....	54	.....
Mrs. Kerr (S) salmon pink, suffused white	12	" 30	April 4	" 29	20	2	3	14	14	56	176	420	71	35	53
Miss Spokane (B) orange salmon, suffused rosy red	6	" 30	" 3	" 29	20	2	3	16	16	31	106	313	.....	52	.....
Vulcan (B) bright scarlet cerise	12	" 19	Mar. 24	" 29	22	2	3	15	15	123	238	628	.....	52	.....
Orange (B) orange-salmon	8	" 24	Mar. 28	" 29	20	2	3	12	15	68	177	388	52	48	50
White Harmony (B) white	8	" 23	April 3	" 29	18	2	3	15	15	51	134	360	.....	47	.....
Peerless Pink (B) mauve-pink, suffused white	12	" 19	Mar. 28	" 29	24	2	3	10	15	110	213	714	.....	39	.....
Chevalier (B) deep mauve	12	" 30	April 3	" 29	21	2	3	16	15	56	153	473	.....	39	.....
	552	.....	.....	.....	.....	.....	.....	.....	.....	4,448	12,188	29,430	107	53	80