DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

Dominion Experimental Station

Cap Rouge, P.Q.

RESULTS OF EXPERIMENTS

1933-36 INCLUSIVE

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REPORT OF THE DOMINION EXPERIMENTAL STATION, CAP ROUGE, P.Q., 1933 to 1936

PREFACE

As the title indicates, this report is essentially a progress report covering the years 1933 to 1936 inclusive. An attempt has been made to summarize, as briefly as possible, the work done at this station since it was given a new objective and direction.

Tables listing varieties of small fruits, tree fruits, vegetables, etc., and detailed results have been omitted where possible from this report.

INTRODUCTION

It would be well at the outset to mention the changes which have taken place at this station. The ever increasing consumption of small fruits and vegetables due to the gradual development of Quebec City and towns in the district, induced a number of farmers and nearby city folks to start growing these crops to fill the local demand.

While some of those who became engaged in growing these crops were successful, a greater number who had less skill and knowledge were too often faced with problems which they could not solve; instead of producing abundant crops of high quality they struggled miserably and brought low grade products into the markets. Conscious on the one hand of the greater demand for high quality fruits and vegetables, and on the other hand of the numerous problems the growers were facing, the authorities of the Federal Government considered that, whilst problems related to horticulture had received much attention in the past, more thorough investigations as to varieties, soils, fertilizers, cultural methods, etc., should be carried out without further delay. For these reasons and for many others, it was decided in 1933 that the Cap Rouge experimental station would become a horticultural station and would have its major projects in horticulture and poultry, and its minor projects in dairy cattle, pasture fertilization and field crops. The Cap Rouge station can thus be considered as a tree fruit, small fruit and vegetable variety testing station for the province of Quebec, particularly for central Quebec.

This station was reorganized as quickly as possible. The data available, in horticulture in particular, cover only a few years' work and although no conclusions have been arrived at as to varieties which should be recommended or dropped, nevertheless, a brief summary is given of each active project and the general trend of the results.

In poultry, as records are available for a much longer time, more interesting information can be presented. A few tables have been included giving the results of 10, and occasionally of 15 years' work.

The Cap Rouge station is the only one in the Experimental Farms System to have a herd of Canadian cattle. While the average milk production is not as high as that of some other dairy breeds, if the high butterfat test is considered, a different picture of the herd is obtained and one which shows well in comparisons.

METEOROLOGICAL RECORDS

The meteorological records show that the 1936 growing season from May 1 to October 31 inclusive was cooler than the 24-year average, and that more rain and less sunshine were recorded. The mean average temperature of the growing season from year to year does not vary appreciably, although the range in temperature is extensive. The highest and lowest temperatures recorded during the last three growing seasons were respectively 84° and 27°; 91° and 24°; 86° and 20°. It is of particular interest to note that the frost-free period is narrowing gradually. The 25-year average is 136·8 days; in 1936 it was only 127 days.

The greatest fluctuations encountered in the records are probably in precipitation. The 24-year average is 23·65 inches of rain, 2·2 inches less than the amount recorded in 1936. The month of May, particularly, was extremely wet. Over six inches of rain fell. This is almost twice the 24-year average and five times the precipitation of the previous year for the same month. Following this high precipitation which delayed seeding operations, a partial drought was experienced during the latter part of June and early July. The growing season, which had begun with high precipitation, ended likewise. Rainfall in September and October was well above the average.

While such high precipitation no doubt favoured pastures and grasslands, cereals and roots were seriously affected. Those crops which despite weather conditions had made good growth, were saved with great difficulty and the yield and quality of most of them suffered considerably. Horticultural crops, particularly those which required heat, were seriously affected by late spring and early frosts.

The growing season was dull, only 1,003·9 hours of sunshine being recorded as compared with 1,140·4 hours in 1934. Lack of sunshine in June and July delayed maturity and contributed to lower the yields of certain crops, particularly tomatoes.

If this brief analysis of the meteorological records of the Cap Rouge experimental station is summarized, it is shown that for 1936 the frost-free growing period was 10 days shorter than the 25-year average, that the late frosts damaged horticultural crops which were planted and even those in hotbeds, and that the seeding of field crops was delayed on account of extremely heavy precipitation in May. Once seeded, most crops were doing well when a partial drought set in in late June and early July. Such radical changes checked some crops so severely that they were total losses and, moreover, this hot dull period particularly favoured insect pests. Because of late seeding or planting and dull weather during June and July, several horticultural crops gave extremely low yields of poor quality and had to be harvested in most unsatisfactory condition. On the whole, farm crops were produced with difficulty. As the final freeze-up came ten days sooner than the previous year, many fields had to be left unploughed. This may have its reaction on next year's crops.

HORTICULTURE

Orcharding

Horticultural work at this station has expanded considerably in the last three years. The projects under way are diversified and deal with problems of economic interest.

Because of location, type of soil and for many other good reasons, a large number of problems had to be put aside at least temporarily so that all attention might be given to those of vital interest to growers of the province at large and to those of central Quebec district in particular. Despite most variable weather

METEOROLOGICAL RECORDS (MAY 1 TO OCTOBER 31 INCLUSIVE)

1934 TO 1936

Year	Average mean temperature	Average mean temperature 22-23-24 years	Spread between lowest and highest	Last frost Date	First frost Date	Frost free period Days	Precipitation Inches	Mean average 22-23-24 years Inches	Number of days with rain	Sunshine Hours	Average sunshine 22-23-24 years Hours	Days totally overcast	Date first snow	Date first seeding	Date first grain cut
		22 yrs						*22 yrs.*			*22 yrs.*				
1934	56·89	56·58	27°—84° (57°)	May 16	Oct. 1	138	21·33	23·38	59	1,140·4	1,089·5	31	Oct. 13	May 4	Aug. 25
		23 yrs.						*23 yrs.*			23 *yrs.*				
1935	56·26	56·60	24°—91° (67°)	" 22	Sept. 28	129	31·98	23·28	77	1,051·0	1,091·7	29	" 27	" 13	" 30
		24 yrs.						*24 yrs.*			*24 yrs.*				
1936	55·62	56·58	20°—86° (66°)	" 22	" 26	127	25·85	23·65	78	1,003·9	1,090·0	34	" 12	" 16	Sept. 4

conditions, some interesting data have been recorded already. In most problems it is as yet too early to draw any conclusions, but in this progress report an attempt will be made to give a picture of the work done in each field of activity.

At the outset, it might be well to mention that at Cap Rouge some 40 acres of land are devoted to orcharding, to the nursery, and to small fruits; the rest is used for carrying out vegetable projects such as variety and purity tests, fertilizer work, cultural methods, different dates of seeding, and the growing of Elite and Registered seed.

The very year the reorganization of the station began, in 1933, apple growers, particularly those in eastern sections, suffered the heaviest losses yet recorded. The short growing season, the severe winters and the late spring frosts will cause growers who replant to be more cautious than ever in the choice of varieties.

In an effort to originate hardier varieties, some 4,000 apple seedlings were planted in the spring of 1936. All these crosses came from the Horticultural Division, Central Experimental Farm, Ottawa.

This new seedling orchard may, in a few years, reveal some outstanding crosses; in the meantime, information is collected on hardiness and growth.

The orchard at this station, in common with other orchards in the district, was not spared by the winter of 1933-34; severe damage was recorded and some varieties were completely winter-killed. Those which stood up best were Melba, Lobo, Cortland, McIntosh, Atlas, Wealthy, Joyce, Lawfam, and Hume. Fameuse was the variety most seriously damaged.

Hardy Root Stock.—It is well known that the severe losses suffered in orchards some 20 years ago were mostly due to poor roots or to roots which were not sufficiently hardy. Some land is gradually being prepared, and although the soil here is not the most desirable for this type of work, a start has been made in growing hardy roots from seed. So far, these roots have been used to graft such varieties as McIntosh, Lobo, Lawfam, Atlas, Cortland and Linda. These whips are kept in the nursery until they are ready to be planted in the orchard. Most of these grafts have served to replace trees in the station orchard.

This fall a few thousand roots were lifted and will be available for grafting. During the latter part of the summer some bud grafting was done with the following varieties on whips of hardy root stock: Charlamoff, Columbia, Anis, Hibernal and Antonovka. The enormous amount of bark splitting on the trunks of apple trees induced the authorities of the Horticultural Division to start this experiment of bud grafting some extremely hardy varieties on equally hardy roots, so as to give a frame which would be capable of withstanding the most severe weather conditions. These trees would then be grafted or budded to the desired fruit bearing varieties. This procedure is no doubt more costly than that followed at present, but it should well repay the difference in cost in the long run.

Plums.—While there are no large plantations of plum trees in the district, yet this fruit crop brings profit to those who have their orchards suitably located. Plums have been grown at Cap Rouge for many years. Among the hardy varieties which produce good quality fruit may be mentioned in order of maturity, Bonne Ste. Anne, Montmorency, Damson, Mirabelle and Mont Royal. Bonne Ste. Anne is recommended as a dessert plum of high quality. While Mirabelle is a fleshy and sweet plum, it is too soft to be recommended other than for the home orchard. For preserves, Montmorency, Mont Royal, and, perhaps the best known of them all, the Damson are all good.

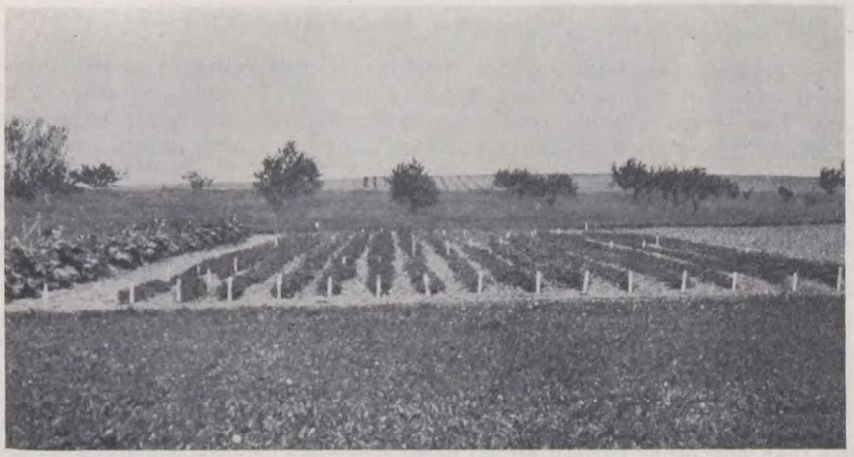
Cherries.—Cherry trees which survived the winter of 1933 have since produced either no fruit or very light crops. The varieties Early Richmond and Montmorency have given the best results at this station.

Small Fruits

Raspberries.—In order to get reliable information on each raspberry variety which was included in the trial and to do justice to it, each row at the station has been severely rogued for the last three years. Records were kept on hardiness, resistance to disease, earliness, quality and quantity of fruit produced, etc. Twelve varieties were planted in the fall of 1933, and as the plantation was declared reasonably free from disease in 1936, a plantation was made according to the Fisher's randomization system, so that the yields might be interpreted satisfactorily.

It is undesirable to jump at hasty conclusions from the data so far collected; in this progress report the trend will be given. For purposes of comparison the varieties tested have been grouped under three headings according to their behaviour. Under local conditions the following varieties are considered as early: Count, Brighton, and Chief; as mid-season: Viking, Newburgh, and Ulster; as late: both Newman 20 and 23. The earliest variety and highest yielder was Count, but it has rather small, soft fruit of only fair flavour. Viking so far has attracted attention for its vigour, its freedom from disease, and for the quality and size of its berries. The late varieties have proved to be very susceptible to mosaic. A variety which seems to have merit for the home garden is Adams 87. It has the longest producing season of any under trial and its berries are of fair size and good quality. Two varieties, Ontario and Munroe, were eliminated because they proved to be disappointing in both plant and fruit.

A few plantings of the most promising varieties have been made this fall on different kinds of soil in the district. The information obtained through these co-operators will be later of great value in making future recommendations.



Part of the strawberry nursery rows at the Cap Rouge Experimental Station.

Strawberries.—Before growers are advised to plant a certain variety and to discontinue growing another, great care must be taken. So many factors influence the results obtained with the same variety according to the district where it is grown, that at least the most important ones which can be controlled should be scrupulously analysed. For these reasons, if for no others, the trials made by growers scattered through the district would be amply justified.

During the last three years, 31 varieties have been under trial. With either a late, cold and wet spring accompanied by late frosts at the time certain varieties were in bloom or a drought at fruiting time, no definite conclusions

have yet been arrived at, nevertheless, the following varieties seem worthy of mention: Early—Laurier, Dick, Howard 17, Jim; mid-season—Dunlap, Carl, Florence, Ralph, William, Parson's Beauty; late—Marjorie, Walter, Paul, Charles.

Of the early varieties mentioned, Dick is outstanding under Cap Rouge conditions. It has vigorous plants which produce many uniform and high quality berries. These, however, are not so firm as they should be for distant shipment. Laurier has all the qualities of Dick with a lighter yield. Dunlap remains the popular mid-season variety. It is only surpassed in quality by William. Marjorie and Walter are promising late varieties and deserve particular attention. These trials are being continued and to the list of varieties already mentioned, others will be added. All these new varieties are the result of crosses made at the Horticultural Division, Central Experimental Farm, Ottawa.

Grapes.—In this district, grapes can only be considered as a home garden crop and the number of varieties which can mature their fruit on the vine has been narrowed down considerably. Of the five varieties under test at this station, Portland and Pearl of Csaba are the only two which are worth mentioning.

Currants.—Currants, either red or black, are not extensively grown. The black varieties are very susceptible to rust and for this reason most of the plantations have been destroyed. Of the red varieties, Stevens No. 9 gives good results at this station.

Gooseberries.—The best yielder among the varieties under trial is Sylvia, although Red Jacket produces large berries of good quality.

Ornamental Gardening

The station collections do not include the most recent introductions or so-called novelties but comprise a sufficient number of kinds to allow a good choice. The severe weather conditions experienced of late years have been a real test and varieties which have survived are worth mentioning.

Dahlias.—The varieties under test are of three kinds, namely: pompon, cactus and decorative. The names of varieties which scored the highest at this station and are recommended for planting are: Pompon—Janet (salmon); cactus—Corallina (brilliant red); decorative—Dwight W. Morrow (apricot yellow).

Gladioli.—New varieties are added every year to the collection which now numbers 69 varieties. Among these, several have been found to be rather late blooming. With early frosts such as often occur in this district, planting should be done earlier so as to give these late varieties a fair chance. The following varieties do well here and should be given a trial: Libelle (heliotrope), ten days earlier than any other variety grown here; Kosmos (yellow-orange); La Paloma (orange); Golden Measure (yellow); Gold Eagle (deep yellow); Schubert (crimson); Eula Terry (dark rose pink); Glorianna (golden salmon); Pelegrina (deep blue).

Hyacinths.—Hyacinths proved to be more easily damaged than other bulbs when planted in the open here. Some blooms were produced but they were short lived. Indoor forcing of this bulb was far more successful. The following varieties proved to be very satisfactory: Gertrude (rosy pink); Marconi (light red); La Victoire (brilliant carmine red); Perle Brillante (light blue).

Tulips and Narcissi.—Tulips and narcissi also can be successfully used for indoor forcing. Varieties of tulips under test which gave good results are as follows: Roi d'Islande (soft rose); Louise de la Vallière (cherry pink); William Pitt (crimson); Chant du Cygne (salmon scarlet); King Harold (dark purple

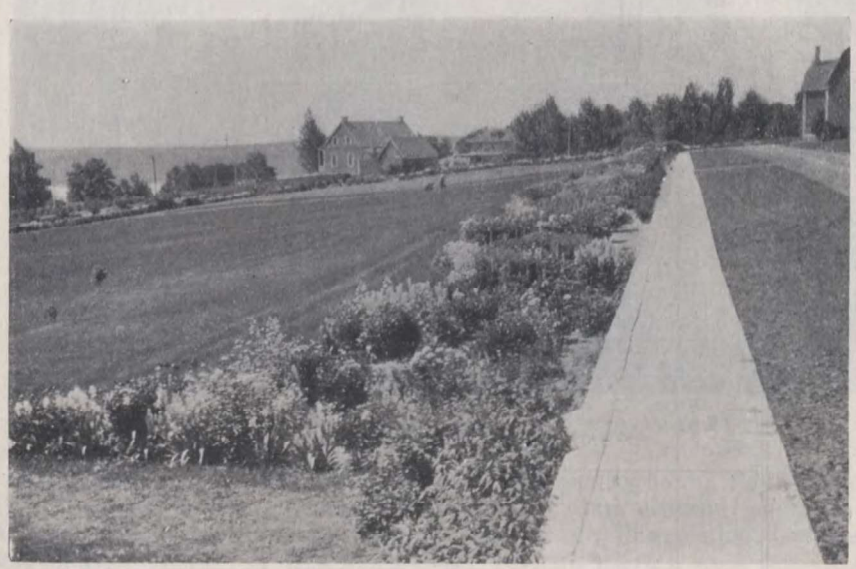
garnet); Allard Pierson (dark crimson maroon). Among the narcissi, Emperor, Golden Spur and King Alfred were good.

The blooming season of tulips varies from year to year, but ordinarily lasts about four weeks. With a judicious choice of varieties and kinds it is possible to have bulbs continuously in bloom during this period. Records show that the following are most suitable for this district:—

SINGLE: Pink Beauty (deep rose)
DARWIN: Bleu Aimable (bright violet purple)
Dream (lavender blue)
BREEDER: Copernicus (dark coppery bronze)
Prince Albert (deep golden bronze)
Abd-el-Kadir (copper bronze)
COTTAGE: Inglescombe Yellow
Inglescombe Pink

Among the narcissi, the three earliest are Victoria, Golden Spur, Emperor. The late varieties are: Ornatus (poeticus sp.) and Poetaz Elvira (hybrid).

Herbaceous Perennials.—The table below gives a few of the outstanding perennials which have proved to be very hardy at this station. To help those who are not familiar with these plants, the approximate height and the colours have been listed. The blooming period as shown extends from early May to October 31.



Part of the perennial border, the main lawn, shrubs and hedges, at the Cap Rouge Experimental Station.

To the list appearing in the table, the following could be added: Aconitum, Aquilegia, Campanula, Hemerocallis, Dicentra, Eranthis, Galanthus, Gypsophila, Lilium (certain species and varieties), Dictamnus, Phlox subulata, Veronica, etc.

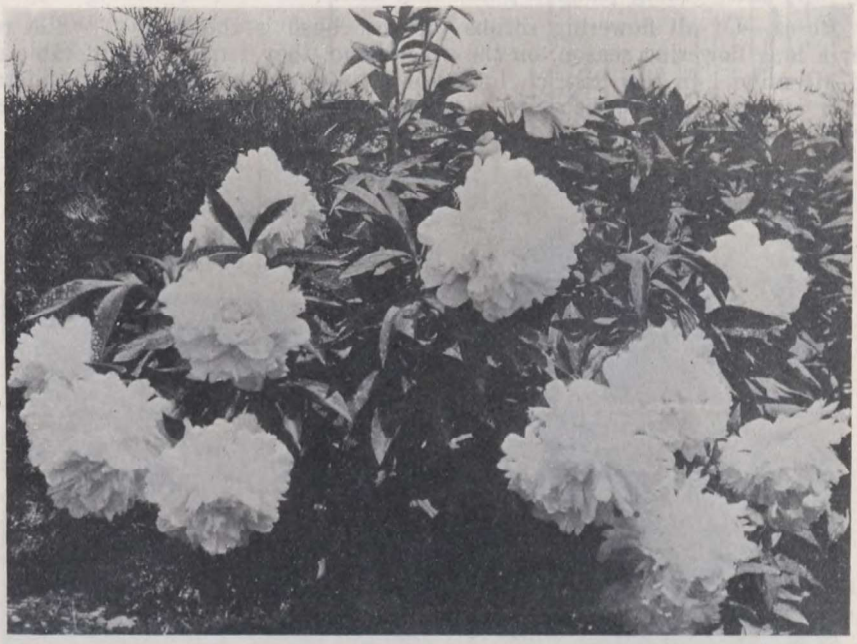
Irises.—The blooming period of the iris at the station begins early in June and extends well over a month. Few flowers provide such a range of colours and shades. Only the outstanding varieties are listed. The order followed is that of the blooming season. The latest varieties begin to bloom about nine days after the earliest ones: Queen Emma (white, blue, yellow), Rose Unique (cattleya orchid), Archevêque (velvety reddish violet), Wyomissing (creamy white, deeper rose), Princess Victoria Louise (sulphur yellow, violet red), Fro

HERBACEOUS PERENNIALS

Varieties	Height in inches	Colour	May	June	July	August	September	October
Arabis	6	White						
Bellis perennis	5	White, rose, red						
Myosotis	8	Light, blue, rose						
Dianthus deltoides	5	Rose						
Sedum acre	4	Yellow						
Lupinus polyphyllus	33	White, blue, mauve						
Pyrethrum	20	White, rose						
Achillea Ptarmica plena	20	White						
Anthemis	16	White yellow-white						
Sidalcea	20	Rose						
Gaillardia	22	Bronze, yellow						
Chrysanthemum	23	Yellow						
Sedum spectabils	16	Rose						
Vinca minor	43	Blue						
Boltonic asteroides	55	Pure white						
Delphinium (hybrids)	40	Blue, lavender						
Althea rosea (mixed)	45	Light blue, red						
Aster ericoides	40	White						
Aster novæ-angliæ in variety	40—50	Pink, light blue, red						
Aster novi-belgii (Glory of Colwall)	33	Light blue						

(rich golden yellow, bronze crimson), Agathe (light and dark blue), Eldorado (reddish violet, yellow bronze), Gazelle (white edge and striped dark mauve), Mrs. Sherwin Wright (pure yellow), Sapho (lavender dark, rich dark purple), Roi des Belges (blue and white), Lilacina (blue mauve), Chester Hunt (light blue, darker blue), Loreley (canary yellow, primrose and blue), Rhein Nixe (pure white and violet blue), Mrs. Reuthe (white, suffused mauve), Prosper Laugier (copper crimson), Mrs. H. Darwin (white), Lohengrin (blue and pale violet), Juniata (dark mauve violet).

Peonies.—Before the iris blooming season comes to a close, the peony buds begin to open. In the list which follows only names of varieties which have been grown successfully at this station appear. These have been grouped as early, mid-season and late, and the colour of bloom indicated.



A plant of the peony variety, Festiva Maxima with over one dozen blooms open at the same time.

Early Varieties.—Octavie Demay (pink) poor quality flower, Edulis Superba (bright mauve pink) short season, Karl Rosenfield (dark crimson) short season, Marquise d'Ivry (white) long season, Souvenir de l'Exposition Universelle (light pink).

Mid-Season Varieties.—Modeste Guérin (solferino red) long season, Alsace Lorraine (white creamy), Festiva Maxima (white, tipped crimson), La Rosière (creamy white), Lamartine (carmine pink), Albert Crousse (rose salmon), Mme Geissler (light pink), Duchesse de Nemours (pure white) short season, Germaine Bigot (pale lilac rose) Sarah Bernhardt (rose).

Late Varieties.—Madame Emile Gallé (deep lilac white), Gloire de Touraine (dark crimson) long season, Asa Gray (shell pink) long season, Félix Crousse (bright red) long season, Charlemagne (light pink), Albâtre (pure white), Solange (deep orange salmon).

Phloxes.—No perennial border is complete without phloxes. Of all the perennials, phlox is perhaps the hardiest. It thrives in practically any kind of

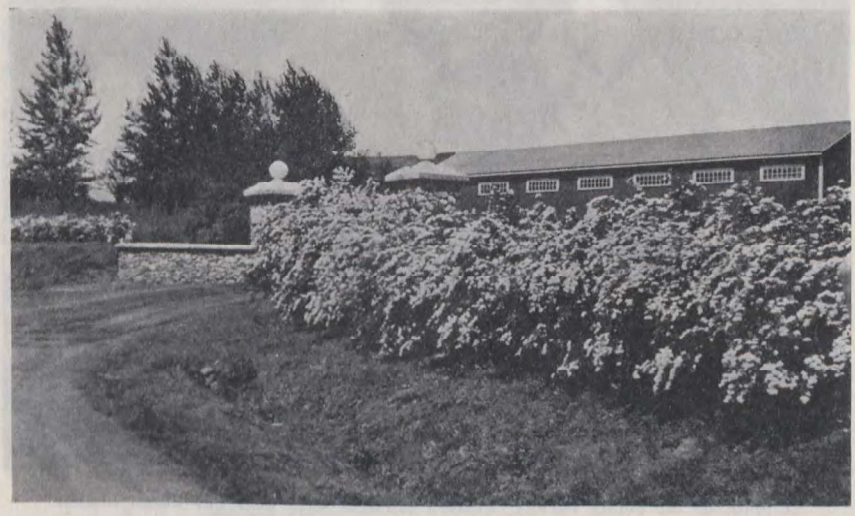
soil and blooms profusely during the whole summer and late into the fall. Among the 32 varieties under test, a few of the best early, mid-season and late varieties are listed:—

EARLY.—Miss Lingard (white with faint lilac eye) the earliest, Pyramid (pure white) long season, Baron Von Dedem (bright scarlet, crimson centre), Mrs. Jenkins (pure white).

MID-SEASON.—Antonin Mercier (dark lilac, white centre), Le Mahdi (dark violet) long season, Nuée (red magenta), Snowdon (pure white), Selma (salmon with carmine eye), W. C. Egan (pale rose), Fraulein Von Lassburg (pure white).

LATE.—Rynstrom (deep shining rose), Fire Flow (scarlet orange), Gustave Charpentier (rosy mauve, white centre), Hanny Pfleiderer (light pink, carmine eye) very late, Viking (salmon pink) very late.

Roses.—Of all flowering shrubs the rose bush is the finest. While roses offer a long flowering season, on the other hand, they require considerable care and attention. In this district, late growth is often the cause of considerable winter damage. Due to the short season and severe winter, the choice of varieties is necessarily limited.



Hedge of Spirea Vanhouttei in full bloom at the entrance of the Cap Rouge Experimental Station.

Varieties tried at this station and found to be very hardy include the following:—

RUGOSA AND HYBRID RUGOSA.—The Grootendorst varieties and Agnes, a double yellow, are very attractive.

POLYANTHA POMPON.—The bushes of this group are low growing and the flower clusters are pompon-like. Joseph Guy and Verdun are outstanding.

HYBRID PERPETUAL.—Captain Hayward, Earl of Dufferin, Frau Karl Druschki, Fisher Holmes, George Arends and Gloire de Chédane Guinoisseau are among the best.

HYBRID TEA.—Etoile de Hollande, Feu Joseph Looymans, Gruss an Teplitz, General MacArthur, Joanna Hill and Talisman are good.

Flowering Shrubs.—A few flowering shrubs and deciduous trees were winter-killed in 1933-34. There remains, however, a fine choice among those which proved to be very hardy and those listed below can be recommended:—

The order followed in the table is that of the blooming season:—

FLOWERING SHRUBS

Varieties	Height (feet)	Colour	May	June	July	August	September	October
Forsythia intermedia	4— 5	Yellow						
Sambucus	8— 9	White						
Mahonia Aquifolium	2— 3	Yellow						
Syringa vulgaris var. Michel Buchner	6— 8	Violet-mauve						
" Charles X	5— 6	White						
" Jacques Callot	8—10	Violet-mauve						
Potentilla fruticosa	2— 3	Yellow						
Viburnum Lantana	5— 6	White						
Caragana grandiflora	7— 9	Yellow						
" *microphylla*	6— 8	Yellow						
Lonicera tatarica	9—11	Pink						
Lonicera tatarica flora rosea	7— 9	Rose						
Lonicera tatarica alba grandiflora	7— 9	White						
Lonicera Morrowii	6— 7	White						
Cornus alba sibirica	8—10	White						
Cornus alba sibirica variegata	7— 9	White						
Spiraea Vanhouttei	4— 5	White						
Syringa villosa	11—12	Bluish-pink						
Diervilla florida Eva Rathke	3— 4	Deep red						
Diervilla florida rosea	4— 5	Pink						
Viburnum dentatum	7— 9	White						
Philadelphus coronarius	6— 8	White						
Philadelphus coronarius aureus	5— 7	White						
Philadelphus grandiflorus speciosissimus	9—10	White						
Philadelphus nivalis	10—12	White						
Philadelphus Satsumi	8—10	White						
Philadelphus Bouquet Blanc	6— 8	White						
Syringa amurensis	14—18	Creamy white						
Syringa japonica	14—16	"						
Spiraea Margaritae	2— 3	Rose						
Hydrangea arborescens	3— 4	White						
Sorbaria sorbifolia	4— 5	White						
Hydrangea paniculata grandiflora	5— 7	White						

Apart from the above, the following shrubs are grown for their foliage and winter berries, Berberis Thunbergii and Berberis atropurpureus, Euonymus europaea, Symphoricarpos albus laevigatus. Cornus species are planted for the colour of the bark.

Hedges.—Shrubs suitable for hardy, decorative hedges of low growth habit are Berberis Thunbergii and Berberis Thunbergii atropurpurea. For tall growing hedges, Thuja occidentalis is one of the best while Picea Abies, Picea pungens, Caragana arborescens, Viburnum Lantana and Syringa Josikea are all satisfactory.

Deciduous Trees.—Deciduous trees which are recommended for planting include the following: Acer saccharinum Wieri, Acer platanoides Schwedleri (this red maple should be more planted), Acer ginnala, Betula pendula, Crataegus crus-galli, Gleditsia triacanthos, Juglans Sieboldiana, Populus angulata cordata robusta, Quercus borealis, Salix alba vitellina var. chermessina, Salix rosmarinifolia.

Apart from these horticultural forms, many straight native species are very good for ornamental purposes.

Coniferous Trees.—Amongst the best coniferous trees tested are: Juniperus communis (medium hardy), Juniperus communis depressa aurea (medium hardy), Picea Engelmanni, Picea pungens Kosteriana, Pinus mugo mughus, Thuja occidentalis pyramidalis (a form of the native), Thuja occidentalis globosa (a form of the native).

Vegetable Growing

The length of the growing season and the kind of weather experienced in the spring of the year are probably the most important factors in determining the varieties of vegetables which growers should select. It is only after repeated trials that recommendations can be made with any degree of certainty. Certain varieties, however, are now recognized as standard and can be grown on practically any soil which is considered fair vegetable land.

In the station trials, the aim is to include as far as possible the new varieties which are claimed to be much earlier than the standard varieties. These are tested along with older sorts to determine whether under local conditions, they will live up to their reputation. A considerable number of the newer varieties under trial have been originated at the Horticultural Division, Central Experimental Farm, Ottawa.

LEGUMINOUS VEGETABLES

Peas.—Among the 33 varieties of green peas which have been under test at this station during the last three years, the Alaska, Bantam Blue, Laxtonian, Meteor and Laxton Progress seem to be the most desirable from the standpoint of earliness. As main crop varieties, Director, Onward O-3319, Kootenay and Bruce have attracted attention. These last named varieties are five to eight days later than those listed as early. For canning purposes, Onward O-3319 and Prince of Wales are among the large size peas, while Tiny ranks first as a small wrinkled pea of very high quality. In any of these three mentioned groups, there are varieties which would not be listed, if the factors of earliness, quality and yield were all considered. While certain varieties may possess all three to a high degree, there are others which show only earliness or yield.

Beans.—The green podded snap or string bean appears to be gaining in popularity especially as a fresh vegetable. The bulk of the snap bean crop, however, is still harvested from yellow or wax podded varieties. Some 24 varieties were under test during the last three years and while certain varieties were dropped owing to inferior qualities, a number of the best ones were retained on the list. According to the data available, it has been found that the following wax varieties are the most outstanding: Round Pod Kidney Wax O-10893; a selection from the Central Experimental Farm, Ottawa, is particularly promising; Pencil Pod Black Wax; Burpee White Wax. There is a difference of two or three days in season between each of these varieties.

Two varieties among the green podded are worthy of mention for their yield and large size pods: Stringless Green Pod and Interloper Challenge Black Wax C.E.F. Another early maturing green podded variety of interest is Princess of Artois. If the pods of this variety are picked before they have reached full size, they are excellent for canning, but if allowed to stand, they get stringy. Refugee (1000 to 1) is considered here as a late variety.

While some Lima beans are produced in the district, the results from varieties tested at this station so far, have been disappointing and no recommendations are warranted at present.

SOLANACEOUS VEGETABLES

Eggplant.—Long and warm season crops such as eggplants and peppers are grown with difficulty in this district. Of the seven varieties of eggplant under test, Blackie, a fairly recent introduction of the Central Experimental Farm, Ottawa, has been outstanding for its hardiness, vigour and earliness. The fruit is attractive in colour and of good quality.

Peppers.—Several varieties of peppers have been under test, but results have been so variable that no specific recommendations are justified at this time.

Tomato.—The data so far accumulated on tomato work have been rendered more difficult of interpretation due to the variation in the growing seasons. The last three years, particularly, present a totally different picture. The season of 1934 was normal with a rather dry month of September. A dry cold spring in 1935 was followed by abnormal precipitation throughout the summer. In 1936, May was cold but extremely wet, June and July were below normal in precipitation, and sunshine was less by 60 hours than the 24-year average.

Tomatoes are produced both for the fresh fruit market and the canning factory. Considering the location and the possibilities, an effort is being made to find a tomato variety that will be as early, or if possible earlier maturing than Earliana, but of better quality.

The variety under test at this station can all be classified in six groups: Earliana, Bonny Best, Marglobe, Sunrise, Stone and Ponderosa. In the neighbourhood of 80 so-called varieties and strains have been tested. Only those which seem to have some merit will be mentioned.

Earliana Group.—Earliana Michigan State College, Abel, Alacrity, Penn State and Earliana Penn State. While all of these gave earlier and smoother fruit than the ordinary Earliana strains, none has been found to be as productive.

Bonny Best Group.—Probably the best all round variety in this group is a new introduction from the Horticultural Division, Central Experimental Farm, Ottawa, to which the name Globonnie has been given. Although Bonny Best is five to seven days later than Earliana, it is gaining in popularity. John Baer is still retained as the main crop variety.

Varieties falling in the other groups are not reported here as they were generally considered too late and failed to produce a quantity of ripe fruit of good quality, comparable to that yielded by the earlier types.

A brief summary of three years work with two groups of tomato growers, one at St. Pierre les Becquets and the other at Neuville, would indicate that definite conclusions cannot be drawn from so short a trial. Seasonal factors have varied so much from year to year that the behaviour of varieties has been abnormal. Eleven varieties were tried. Bonny Best and John Baer have given the largest quantity of No. 1 fruit while Earliana gave the heaviest total crop. The best distance of planting, according to results obtained, would be three feet apart each way. Pruning and staking have some effect on earliness and grade. Staking is particularly advantageous on heavy soils where the fruit is more liable to get dirty and to rot before reaching maturity. It is doubtful, however, if it can be recommended for commercial plantings. Fertilizer trials were not conclusive except that heavier applications generally gave larger yields. This project was carried out with the co-operation of the provincial Department of Agriculture.

LEAFY VEGETABLES

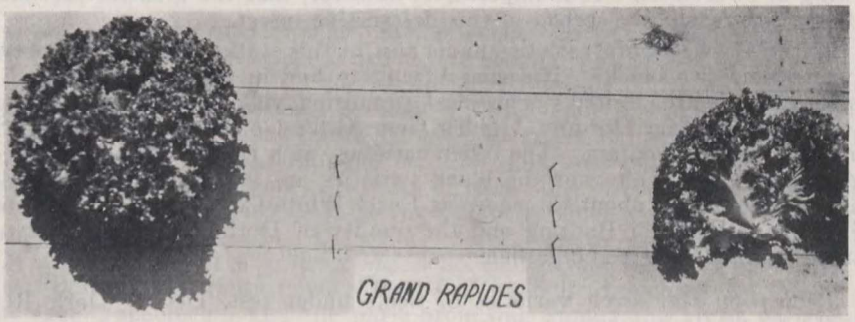
Under this heading are included such vegetables as, lettuce, spinach, swiss chard, cabbage, chinese cabbage and cauliflower.

Lettuce.—Lettuce is a vegetable which does well on most soils. The illustrations show a few of the head types and one loose leaf type which did best at this station.

Big Boston, an outstanding variety amongst the butterhead types of lettuce.

Hanson, one of the best light green, crisphead varieties.

New York, the leading variety amongst the dark green, crisphead types.



Grand Rapids, the standard of quality in leaf lettuce.

The 47 varieties or strains under test last year, could be grouped into the following types: looseleaf, 9; butterhead, 14; crisphead, 17 and Cos type, 7.

Grand Rapids seems to be the most popular looseleaf lettuce, while amongst the butterhead types, Boston or Big Boston is outstanding. For crisp head and light green colour, Hanson comes first with New York the leader amongst the deep green types.

Spinach.—While there is a greater demand than formerly for spinach yet it is not grown on a large scale in this district. Among the varieties tested, King of Denmark and Viroflay are leaders.

Swiss Chard.—A potherb which is easy to grow and which provides excellent greens for salads is Swiss chard. The variety Giant Lucullus gave good results here.

Chinese Cabbage.—Chinese cabbage is another fine salad plant which deserves more attention from the growers. Late seedings of this crop have been made by a few growers and at this station. For the last two years, Chinese cabbage has been kept in cold storage very successfully and sold on the Christmas and New Year markets. This experiment is being continued. The Chili variety has given the best results so far.

Cabbage.—Among the varieties of early cabbage, Golden Acre and the selection, Golden Acre Viking are leaders at this station. Of the late varieties, Danish Ballhead, Danish Roundhead and Danish Cannonball have shown more uniformity and better yields than others.

Cauliflower.—Nine varieties of cauliflower have been under test and among them, the earliest was Erfurt. White Wonder gives larger heads but is generally one week later. The Snowball variety may compete with Erfurt but there are great variations between the strains.

Planting Distances.—While planting distances will vary with soil type, varieties, etc., experiments have been made to determine the best planting distances for leafy vegetables. The distances given are those which gave best results at this station. On similar soil throughout the district, equivalent results should be obtained. Cabbage (early) 20 inches—cabbage (late) 24 and 30 inches—cauliflower 20 inches—Swiss chard and the three types of lettuce (loose-leaf, butterhead and crisphead) 10 inches—spinach 6 inches.

OTHER VEGETABLES

Sweet Corn.—The central Quebec district has not yet been invaded by the European corn borer to the point where growers have had to discontinue the growing of sweet corn. It is imperative, however, that the greatest precautions be taken to prevent the spread of this destructive insect.

Of the 47 sweet corn varieties under test at this station, 30 are yellow types, 15 whites and two blacks. It seems difficult to find in any one of these all the qualities which are desired. The most promising yellow varieties in order of season are: Banting, Dorinny, Golden Gem, Gill's Golden Early Market, Sunshine and Golden Bantam. The other varieties, as a rule, generally mature too late. Neither the white nor the black varieties are very popular. The Early Market seems to be about the same as Early White Cory. Pickanninny, while it has the earliness of Banting and the quality of Dorinny is not likely to be planted except in the home garden.

Beets.—Of the seven varieties of beets under test, Detroit Dark Red is still the leader.

Carrots.—This crop is disposed of in two ways, either as bunched carrots or with tops removed.

Among the 36 varieties grown at the station, Nantes had the best appearance and quality. Although the tops are small for bunching, it is considered one of the good ones for winter storage. A selection of Chantenay 0—10944 from the Central Experimental Farm, Ottawa, is slightly smaller and shorter but is even in size and smooth. Late seedings have provided bunched carrots for the winter months which compared favourably with the imported ones. Information on carrots for storage is to be found elsewhere in this report.

Rutabagas.—The growing of rutabagas in the Quebec district was at one time a profitable enterprise and the rutabagas from Ste. Foye were sold at a premium on local and American markets. Low prices and disease along with other factors discouraged a number of growers, but recently a revival of interest in the growing of this crop has induced this station to carry on an experiment with varieties and dates of seeding rutabagas for winter use.

While weather conditions have rendered sound conclusions difficult to draw, nevertheless, a few varieties of merit are listed. The results of this two-year test of some 26 varieties show that for uniformity, quality and all-round use, the choice of varieties would be as follow: Ne Plus Ultra, Perfect Model, Canadian Gem, Hall's Westbury, Bangholm, Long Island, Magnum Bonum.

Rhubarb.—For quality, the varieties Ruby and Macdonald are recommended. The St. Martin variety is a very heavy yielder but the stalks are green in colour and very acid.

Rhubarb Forcing.—The Macdonald variety was tested and one year's results show that eight, two-year-old crowns each gave an average of five and one-half pounds of excellent rhubarb. As the stalks are of very high colour and require little sugar at cooking, it is highly recommended for a fine winter dessert.

PLANT PROTECTORS

With warm season crops such as peppers, eggplants and tomatoes, plant protectors or "hot-caps" are beneficial, especially in the early stage. They assure the plants a quick start and make room in hotbeds or greenhouse benches for other later seedings. Results at the station show that the stand of early plants is from 15 to 40 per cent higher with hot-caps than on the check plot. Maturity was also hastened by a few days. Of the two types of hot-caps used, the hi-caps have given better results when used on cabbages and cauliflowers. To growers who would be interested in using hot-caps, it is recommended that a small trial be made before booking large orders.

MUCK SOIL STUDIES

Celery.—The growing of celery in the Quebec district dates back to a good many years but the growing of celery for storage purposes is comparatively new. A co-operative project (federal and provincial) is under way and results promise to be most interesting. A study is being made of the soils, both muck and heavy loams, as well as celery varieties of green and self-blanching types, different dates of seeding, different fertilizer mixtures and different rates of application. A certain number of crates of these different lots have been stored in the Harbour Commission Cold Storage Plant in Quebec city and bi-monthly inspections are made.

While it is too early to draw any conclusions from the data on record, of the self-blanching varieties under test, Golden Self Blanching has stood up better than Phenomenal and the most promising among the green varieties is Salt Lake.

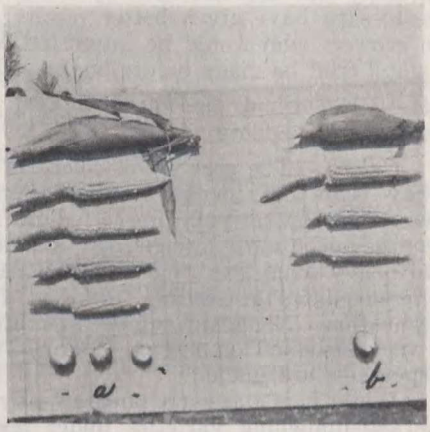
The celery grown on muck has not kept as well as that grown on heavier soil. This holds true of both self-blanching and green varieties. As for dates of seeding, early April seems to give sufficiently matured celery at the time of harvest for good keeping in cold storage. Heavy applications of farm manure plus heavy applications of complete fertilizer gave the highest quality celery on loam soils. The half crate which holds about two dozen seems preferable to the larger size container. Further trials will be made, as seasonal conditions vary so much from year to year, that it would be unwise to draw definite conclusions on so little information. What has been said above in regard to varieties, soils and fertilization, may be changed or modified by the results of succeeding years.

Bunched Carrots.—Until three years ago, in the Quebec district, no late seedings of carrots were made with a view to bunching and storing them for sale on the winter markets. Rather encouraging results have been obtained so far with this project. The varieties which seem desirable are those of the Nantes type. The type of crate preferred is the ordinary carrot crate containing about five dozen bunches of five carrots each. The carrots are washed previous to storing. Carrots kept at 32° were in very good condition and the foliage retained its normal colour for 98 days in crates where no ice nor paper had been used. The carrots grown in heavy soil were firmer than those grown on muck. The results obtained were closely watched by the growers, a number of whom have sold their stored carrots at a profit during the two years of the experiment. Further trials will be made as to dates of seeding, varieties and kinds of soil.

Purity Test with Vegetable Seeds

In co-operation with the Seed Branch of the Dominion Department of Agriculture, purity tests of vegetables have been conducted. Part of this purity test work which was done formerly at the Central Experimental Farm, Ottawa, has been transferred to this station. The samples tested in 1935 included: carrots, 366 samples covering 28 varieties; sweet corn, 246 samples—45 varieties; onions, 359 samples—63 varieties; tomatoes, 360 samples—67 varieties. In 1936 there were tested 215 samples of sweet corn representing 49 varieties; lettuce, 274 samples—47 varieties; onions, 347 samples—56 varieties, and tomatoes, 282 samples—69 varieties.

Two rows of corn which are supposed to be of the same variety. The row on the left includes both tall and dwarf types while the other row is uniform in height.



Cobs from the two rows of corn shown opposite. Those from the ununiform row are shown at the left and reflect the mixed character of the parent plants. On the right are cobs from the uniform row.

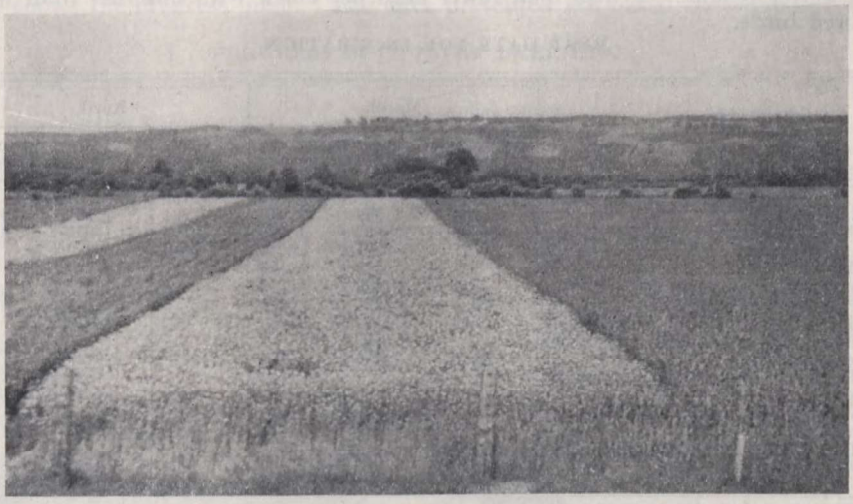
The above illustrations give an idea of the seed mixtures which are sometimes offered for sale and are detected through these purity tests. The row of sweet corn labelled No. 1 is supposed to be of the same variety as that labelled No. 2. Cobs (*a*) are taken from row No. 1 and (*b*) from No. 2. The first lot is shown to be a mixture with short and tall stalks, short and long ears, irregular rows on the cobs, etc. In the second lot, the stalks are remarkably uniform as are also the length, straightness, and number of rows on the cob.

Elite and Registered Vegetable Seed Production

It is most important, whenever possible, to have home-grown seed. Much of the imported seed comes from countries with warmer climate and often lacks hardiness. Not all seeds, of course, can be grown in this province but more of those varieties which will mature properly, should be grown. No less important is the matter of keeping the varieties pure. With these points in mind, this station has under way some interesting projects in the production of Elite and Registered seed.

The following crops are grown from foundation stock for the production of Elite seed: *Peas*, Onward O-3318, Prince of Wales O-3340, Prince of Wales O-3342, Tiny 441, Advancer O-2997; *Beans*, Princess of Artois. *Tomato*, Abel. *Corn*, Dorinny.

Several hundred pounds of registered seed of Laxton Progress peas and Pencil Pod Black Wax beans have already been produced. This project is being continued.



A multiplication plot of Tiny peas at the Cap Rouge Station.

POULTRY

All the birds kept at this station are of the same breed, the Barred Plymouth Rock. From year to year, the flock has been increasing. At the end of 1936, the flock numbered about 600 birds, almost twice as many as in 1933 when the reorganization of the station took place.

Among the various active projects, there are some which are of particular interest to farmers and poultrymen and on which valuable data are available. With poultry as well as with dairy cattle, the practice of inbreeding was followed until 1933. While this is still being followed, during the past three years work with outside blood has been started.

The tables included in this report give comparison of results obtained so far by both breeding methods.

There are now two types of laying house at the station. One is a single wall, cotton front house, the other warmly built having insulated double walls and double windows. Results of egg production in both types of house are reported.

HATCHING SUMMARY—1936

—	Total	Hens	Pullets	Time set		Line-breeding	Out-breeding
				March	April		
Total eggs set	3,120	2,396	724	1,989	1,131	1,049	438
Number fertile	2,906	2,246	660	1,852	1,054	964	420
Percentage fertile	93·14	93·74	91·16	93·11	93·19	91·90	95·89
Number chicks	2,073	1,640	433	1,285	788	691	359
Percentage total eggs hatched	66·44	68·45	59·81	64·61	69·67	65·87	81·96
Percentage fertile eggs hatched	71·34	73·02	65·61	69·38	74·76	71·68	85·48
Number of chicks alive when wing banded	2,004	1,604	400	1,234	770	671	357
Percentage chicks hatched, alive when wing banded	96·67	97·80	92·38	96·03	97·72	97·11	99·44
Total eggs required for one chick hatched	1·51	1·46	1·67	1·55	1·44	1·52	1·22
Total fertile eggs required for one chick hatched	1·40	1·37	1·52	1·44	1·34	1·40	1·17
Total eggs required for one chick when wing banded	1·56	1·49	1·81	1·61	1·47	1·56	1·23

This table shows that in 1936 it took fewer eggs from hens than from pullets for one chick when wing banded (that is at three weeks old). In comparing the two months, March and April, it is also noticeable that the latter gave better results. It also took fewer eggs per chick with outcross than with linebred birds.

BEST DATE FOR INCUBATION

—	March			April		
	Average 11 yrs.	1936	Average 12 yrs.	Average 11 yrs.	1936	Average 12 yrs
Total eggs set	1,284	1,989	1,343	1,284	1,131	1,271
Number fertile	1,162	1,852	1,220	1,194	1,054	1,182
Percentage fertile	90·5	93·1	90·8	93·0	93·2	93·0
Number chicks	621	1,285	676	691	788	699
Percentage total eggs hatched	48·4	64·6	50·3	53·8	69·7	55·0
Percentage fertile eggs hatched	53·4	69·4	55·4	57·9	74·8	59·1
Number chicks alive when wing banded	595	1,234	649	662	770	671
Percentage chicks hatched, alive when wing banded	95·8	96·0	96·0	95·8	97·7	96·0
Total eggs required for one chick hatched	2·07	1·55	1·99	1·86	1·44	1·82
Total fertile eggs required for one chick hatched	1·87	1·44	1·80	1·73	1·34	1·70
Total eggs required for one chick when wing banded	2·16	1·61	2·07	1·94	1·47	1·89

The above table shows that for 1936, April was preferable to the month of March for incubation and that the 12-year average also favoured this month.

HENS vs PULLETS

—	Hens			Pullets		
	14 yrs. 1922-35	1936	15 yrs. 1922-36	14 yrs. 1922-35	1936	15 yrs. 1922-36
Total eggs set	1,339	2,396	1,409	1,251	724	1,216
Number fertile eggs	1,221	2,246	1,289	1,157	660	1,124
Percentage fertile eggs	91·2	93·7	91·5	92·5	91·2	92·4
Number chicks hatched	659	1,640	724	625	433	612
Percentage total eggs hatched	49·2	68·4	51·4	50·0	59·8	50·3
Percentage fertile eggs hatched	54·0	73·0	56·2	54·0	65·6	54·4
Number chicks hatched alive when wing banded	630	1,604	695	580	400	568
Percentage chicks hatched, alive when wing banded	95·6	97·8	96·0	92·8	92·4	92·8
Total eggs required for one chick hatched	2·03	1·46	1·95	2·00	1·67	1·99
Total fertile eggs required for one chick hatched	1·85	1·37	1·78	1·85	1·52	1·84
Total eggs required for one chick when wing banded	2·13	1·49	2·03	2·16	1·81	2·14

The 15-year comparison of hens and pullets is summarized in the above table. The current year's results are striking in both cases when compared to the 15-year average. In the case of hens it took only 1·49 eggs per chick when wing banded as compared with the 15-year average of 2·03. While it takes more eggs from pullets than from hens to produce a chick at wing-banded stage yet progress has been made there also. In 1936, only 1·81 eggs were required whilst the 15-year average is 2·14.

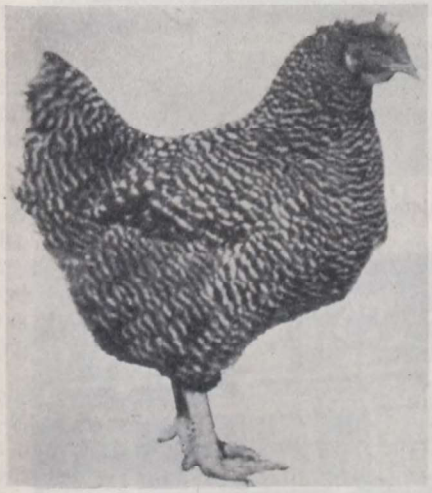
Pedigree Breeding for Egg Production

Pedigree work was started at this station in 1918. During the past 18 years, much variation has been recorded in body weight of birds and in the number

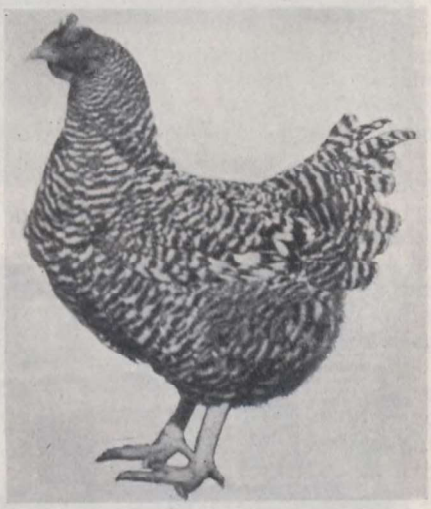
and weight of eggs laid. It is interesting to note that in 1918 only three pullets had laid 150 eggs or more which weighed 24 ounces per dozen while one other bird had a record of 180 eggs weighing 21 ounces per dozen. The following table shows the progress made. The data presented are based on linebred birds only.

PROGRESS IN POULTRY BREEDING

Year of mating	Birds on hand on Sept. 4th	Pullets which qualified		Average		
		Total	Per-centage	Body weight	Eggs laid during year	Egg weight per dozen
				lb.		ounces
1933	217	66	30·4	6·2	203·9	24·7
1934	172	51	29·7	6·8	211·4	24·8
1935	116	39	33·6	6·9	205·2	25·1



The best linebred bird in the Cap Rouge station flock.



The highest producing outcross bird at Cap Rouge.

The best linebred bird in the flock had the following record: weight of bird, 8·2 pounds; number of eggs, 270; weight of eggs, 59·1 grams (56·7 grams—24 ounces per dozen).

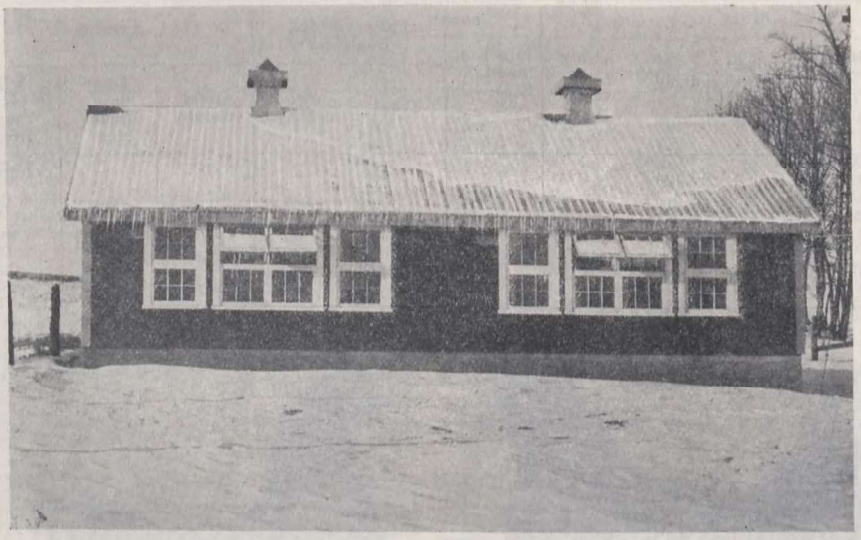
The highest production ever recorded at this station was given by the outcross bird S.323. She laid 302 eggs weighing 61·6 grams or 26·1 ounces per dozen. This pullet weighed 7 pounds.

Good vs. Poor Layers.—Records show that from 1919 to 1928, a period of ten years, it required from good layers an average of 3·05 eggs for one chick when wing banded and 3·09 eggs from poor layers. In 1936, the number of eggs required was practically the same in both cases, 1·75 to 1·70.

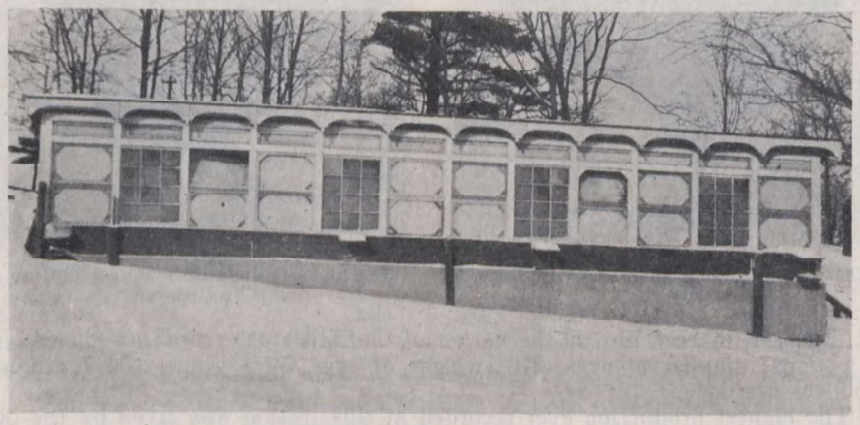
By careful selection, better feeding and more efficient methods of incubation, the number of eggs required per chick when wing banded has been reduced from 3·05 and 3·09 to 1·75 and 1·70 or almost 50 per cent.

Housing

Since the construction of a warmly built poultry house in 1935, the production of the birds housed therein, the quantity of feed consumed in both warm and cold houses and the difference in temperature for a period of 100 days, November 1 to February 8, has been checked.



Poultry house, 20 x 36 feet, with insulated walls and double windows.



Single walled glass and cotton front house, 12 by 40 feet.

The data show that so far the average production for the 100-day period was very much the same in either house in 1935. There was, however, a 10 per cent difference in favour of the warm house as soon as the cold weather came, and this difference was still further increased to 14·2 per cent in 1936.

During the 100-day period, the lowest temperature recorded outside, on December 30 and February 7, was 15° below zero. In the warm poultry house, on the same dates, the temperature was 20° and 16° above zero. In the cotton-front house, it was 6° and 4° above. The temperature was consequently 14°

and 12° higher in the warm house than in the cotton-front house. This drop in temperature had its influence on production and to some extent explains the larger production of 10 and 14 per cent in the warm house over the cotton-front house.

There was little difference in the quantity of grain and mash consumed in the two houses and the gain in weight of the birds was the same in each case. When the lowest outside temperatures were recorded, there was always 10 to 15 degrees difference between the two houses, the glass and cotton-front house of course showing the lower temperatures. These observations will be continued as more data are needed before definite conclusions can be drawn, although indications are in favour of the warm house.

Results of Linebred vs. Outcross Pullets

The introduction of outside blood into part of the flock has brought about results which are not yet conclusive. The hybrid vigour of the first cross might have been more evident and more data are needed before arriving at any conclusion. In 1933, nine inbred hens of an average body weight of 5·98 pounds and a production of 190·3 eggs of 60·8 grams to the dozen were mated to a related cockerel and this mating gave 35 pullets. The records of these pullets as compared to that of their dams were much lower in both number and size of eggs. The average body weight was 6·3 pounds and production 171 eggs of 57·5 grams. The same dams were mated again in 1934 with a cockerel of outside blood. This mating gave 30 pullets. These pullets were much heavier than their dams, 7·3 pounds as compared to 5·98. The number and size of eggs was smaller, being 172·0 as against 190·3 eggs, and the weight 59·3 grams as compared to 69·8 grams.

The second year's work is no less interesting. The averages of body weight, number and weight of eggs of the 11 inbred hens were 6·28 pounds—199·4 eggs—59·0 grams; those of the 66 pullets of the inbred mating were 6·8 pounds—164 eggs—56·5 grams, in this case, only a slight gain in body weight and a loss on number and weight of eggs. When the same dams were mated to an outbred cockerel, the result was considerably different. The average of the 38 pullets was 7·4 pounds body weight—181 eggs of 59·5 grams, a gain in body and egg weight.

In 1935, ten hens which were 50 per cent outcross were mated to a non-related bird and this mating gave 25 pullets. The dams' records were 6·9 pounds—230 eggs of 62·4 grams; the daughters', 7·1 pounds, which was a light gain in body weight—199 eggs of 62·4 grams. The weight of the eggs remained the same while a drop in production of 31 eggs was recorded. The project is to be continued.

This brief résumé of the breeding work shows that progress has been made in line-breeding. The other method, that of outcrossing, is too recently inaugurated to permit conclusions to be drawn. The number of birds with which this method is being tested is rather small and a few more years' work will be needed to get a clear picture. Nevertheless, the results of first and second crosses are encouraging. The weight of birds and that of the eggs has been raised and with careful selection, the daughters should become better producers than their dams.

ANIMAL HUSBANDRY

The work in live stock at this station has gradually been reduced and at the present time only horses and Canadian cattle are maintained. The former are for work purposes only and the latter to provide material for studies in the breeding of Canadian cattle and for measuring the productivity of pastures in pasture improvement studies.

Previous to 1933, the breeding method followed with Canadian cattle was that of linebreeding. This system of breeding had in the past been responsible for effecting considerable improvement in both milk production and fat percentage in the herd. In more recent years, however, there was a decline in the milk production and a serious falling-off in type, due mainly to the use of two bulls, which, while well bred, failed to reproduce satisfactorily. The herd was culled severely and good type out-cross sires were secured and used with what appear to be fairly good results.

The herd has been reduced from a total of 40 on January 1, 1933, to 37 head on December 31, 1936, the latter number being made up of 18 milch cows, 16 heifers and 3 bulls. The total number of animals, and more particularly the proportion of milk cows, will be increased as suitable heifers become available.

Data on cows qualifying in the R.O.P. during the period are shown below.

COWS WHICH QUALIFIED—1933-36

Year	Number of cows in R.O.P.	Average age of cows		Cows which qualified		Lb. of milk Average		Lb. of B.F. Average		Average % B.F.	
		305	365	305	365	305 —	365	305—	365	305 —	365
1933	18	2	2	5	2	6,670	7,451	328	361	4·92	4·84
1934	x17	3	5	4	3	7,221	9,629	340	485	4·71	5·04
1935	x19	4	—	12	—	7,580	—	385	—	5·08	—
1936	x15	5	5	7	1	8,245	8,921	421	409	5·07	4·58

x—Cows which were sold before ending their lactation:
1934—1.
1935—5.
1936—1.

It will be noted that in recent years a larger proportion of the cows are qualifying in the 305-day class than in the 365-day class, thus indicating a more efficient breeding schedule. Also there is a progressive increase in production in cows qualifying in R.O.P.

The production by lactation period of all cows completing a lactation in the respective years covered by this report is shown in the following table:—

PRODUCTION BY LACTATION OF ALL COWS COMPLETING RECORDS IN 1933-34-35-36

Year	Number of cows	Average age of cows	Days in milk	Milk produced	Fat produced	Per cent fat
		Yrs.	Days	Lb.	Lb.	%
1933	19	4	382	7,315	358	4·89
1934	20	5	370	7,064	352	4·98
1933	19	5	320	7,018	357	5·09
1936	14	5	340	8,247	415	5·03

It will be noted that the average length of lactation period has decreased by 42 days, while average milk production has increased by 932 pounds, fat production by 57 pounds, and fat percentage by 0·14.

Feed Cost of Milk and Fat Production.—During the years 1933-36 inclusive, records have been kept of the monthly and yearly feed cost of milk and fat production. The data obtained are presented in the table which follows:—

FEED COST OF MILK AND FAT PRODUCTION

Year	Average Yearly Cost		Average Winter Cost November May		Average Summer Cost June October	
	Milk per cwt	Fat per lb.	Milk per cwt	Fat per lb.	Milk per cwt	Fat per lb.
	$ cts.		$ cts.		cts.	
1933	1 03	0·21	1 28	0·25	86	0·18
1934	1 04	0·21	1 16	0·23	85	0·17
1935	0 98	0·19	1 19	0·24	91	0·18
1936	1 01	0·20	1 28	0·25	63	0·13

Tuberculosis and Contagious Abortion.—During the period 1933 to 1936 inclusive and even before, certificates were issued every year declaring the Cap Rouge herd to be free of tuberculosis and contagious abortion.

Sales and Leases of Breeding Stock.—From January 1, 1933, to December 31, 1936, nineteen bulls were sold for breeding purposes in the province of Quebec. In 1936, two bulls were loaned to breeders, one to a private breeder and another to an institution.

Pasture Experimental Work.—In 1933, an experiment on permanent pasture was started at this station. Weather conditions made difficult the establishment of a good pasture sod. The catch of grasses not being satisfactory after the first seeding, it was ploughed again in the fall of 1934 and seeded down in the spring of 1935 with oats as a nurse crop. The seed mixture used was composed of timothy, red clover, alsike, Kentucky blue, red top, and white Dutch. The permanent pasture has an area of 23·42 acres divided into five fields of 4·68 acres each. Each field receives a different fertilizer treatment. The pasture productivity is measured by two methods, that of grazing by milch cows and by cage clippings for dry matter analyses. As grazing only started in the spring of 1936, there are no data available yet. Records are kept as to grazing days per animal unit per acre, milk production, gain or loss in weight of animals. Clippings are also taken from cages every three weeks on each fertilizer treatment and these grass samples are sent to Ottawa for dry matter analyses. As soon as there are sufficient data to permit a fair comparison between the different treatments, this information will be released.

FIELD HUSBANDRY

Pasture Improvement

Because of the importance of improved pastures in the farm organization, it was decided, when this station was reorganized in 1933, that pasture improvement experiments should be started as soon as possible. The plan of these experiments has been outlined in the animal husbandry section of this report.

In the fertilization of the pasture plots the following treatments were applied:—

1. Check, no manure or fertilizer.
2. Farm manure, 12 tons per acre every three years.
3. Light fertilizer mixtures.
   - (*a*) 600 pounds per acre 20 per cent superphosphate.
   - (*b*) 300 pounds per acre superphosphate every three years.
   - (*c*) 50 pounds per acre superphosphate, 37 pounds per acre muriate of potash, every three years.
   - (*d*) 300 pounds per acre superphosphate, 75 pounds per acre muriate of potash, every three years.

4. Medium fertilizer mixtures.
   (*a*) 100 pounds per acre ammonium sulphate annually; 300 pounds per acre superphosphate, 75 pounds per acre muriate of potash, every three years.
   (*b*) Same as (*a*) plus two tons ground limestone.
5. Heavy fertilizer mixtures.
   (*a*) 150 pounds per acre ammonium sulphate annually; 450 pounds per acre superphosphate, 112 pounds per acre muriate of potash, every three years.
   (*b*) 100 pounds per acre ammonium sulphate, 300 pounds per acre superphosphate, 75 pounds per acre muriate of potash, annually.

Drawing conclusions from a single year's results is not justified, but it may be noted, however, that this area provided pasturage for a period of 122 days, which could have been extended another ten days at least had it not been for the excessive rainfall during early May. The field receiving the heaviest fertilizer applications provided the highest number of animal unit days per acre.

The growing season being comparatively favourable, the herbage made such good growth that at times it was difficult to keep it grazed down as closely as desired. While the legumes predominated the first year, the grasses at the end of the grazing season were well established, and unless serious winter-killing takes place, a more improved pasture may be expected in the future.

Another experiment started at the same time was a comparison of a permanent Kentucky blue grass pasture with a hay mixture used for pasture in a three-year rotation as follows: First year, oats, treated with two tons ground limestone per acre in 1933. Second year, clover hay. Third year, pasture, with 12 tons manure applied in the fall for the succeeding oat crop.

A single year's results only are available, and until the Kentucky blue grass becomes fully established, any comparison made would be of little value.

FORAGE CROPS

Turf Grasses

In 1935, five species of turf grass and five mixtures were sown on plots of equal size at this station. The aim was to find which of these species or mixtures would do best on soils similar to that of the station, and which could be recommended to those making or renovating lawns. It is too early yet to state which species or mixture is likely to give the best sward. According to station observations and those made by specialists from the Botany Division, Central Experimental Farm, Ottawa, red top, creeping red fescue, and Kentucky blue grass were very similar in making good stands.

As the use of chemical fertilizers on lawns will likely become more popular in time, a test with five different fertilizers is also conducted on these plots. Results so far show little difference between the fertilized and the check plots.

Another experiment was started in 1935, to check the influence of different herbicides used to control weeds on established lawns. In accordance with analyses and observations made during the summer by specialists from the Botany Division, there were no outstanding differences between the treatments nor any radical changes in the botanical analyses of the treated plots except that the amount of bare ground has been increased more or less on treated plots, particularly those receiving barnyard manure, sodium chlorate, and various commercial plant food mixtures, due to more or less weed growth being destroyed. The worst weed on lawns seems to be dandelion. When comparing the check plots with the treated plots, that which received ammonium sulphate and sodium chlorate showed fewer dandelions than any of the others, indicating that such a combination might be valuable in checking weeds and particularly dandelions on lawns. These experiments will be continued.

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