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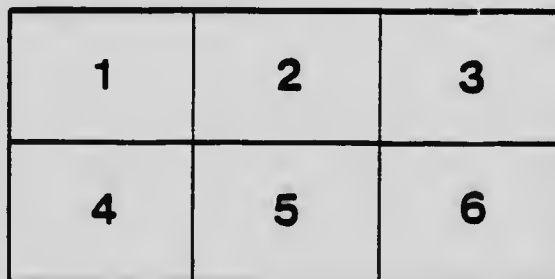
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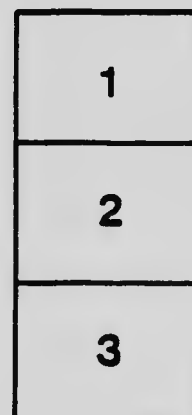
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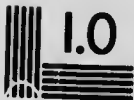
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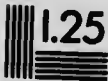
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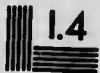
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DEPARTMENT OF AGRICULTURE.

PROVINCE OF BRITISH COLUMBIA.

BULLETIN No. 51.

INFORMATION FOR FRUIT-GROWERS

WITH

LIST OF VARIETIES FOR COMMERCIAL AND  
HOME PLANTING.

BY

R. M. WINSLOW, B. S. A., Provincial Horticulturist.



THE GOVERNMENT OF  
THE PROVINCE OF BRITISH COLUMBIA.

PRINTED BY  
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Under each district heading there are discussed the main facts concerning its climate, altitude, area, soils, present production, prospective production, types of fruit most suitable, transportation facilities, markets, and other considerations affecting its development. It has been beyond the scope of this bulletin to go into these in great detail, but the Department is at the service of any intending fruit-grower who desires further information that will guide him in the choice of varieties or the planting and care of his orchard.





DEPARTMENT OF AGRICULTURE,

VICTORIA, June 18th, 1913.

*Hon. Price Ellison,*  
*Minister of Finance and Agriculture,*  
*Victoria, B.C.*

SIR,—I have the honour to transmit herewith Bulletin No. 51, entitled "Information for Fruit-growers, with List of Varieties for Commercial and Home Planting," compiled by R. M. Winslow, B.S.A., Provincial Horticulturist.

It is hoped that this bulletin may prove of service to fruit-growers in this Province, in giving information as to those varieties which have best proved their adaptability in the different districts for commercial orchards. The information contained therein is compiled from a variety of sources—from observations made by our Assistant Horticulturists, from information supplied by fruit-growing associations and leading orchardists throughout the Province—and may well be taken as representing the consensus of opinion as to the best and most successful varieties of fruits in the different fruit-producing centres.

I have the honour to be,

Sir,

Your obedient servant,

WM. E. SCOTT,

*Deputy Minister.*



# INFORMATION FOR FRUIT-GROWERS

WITH

## LIST OF VARIETIES RECOMMENDED FOR PLANTING BY THE PROVINCIAL DEPARTMENT OF AGRICULTURE.

(As revised November 15th, 1912.)

By R. M. WINSLOW, B.S.A., PROVINCIAL HORTICULTURIST.

### INTRODUCTION.

**I**N issuing a revised edition of the "Varieties List," the Department of Agriculture has several objects in view:—

- (1.) To provide definite information as to the best varieties of fruit to plant, both for commercial purposes and for home orchards;
- (2.) To enable fruit-growers of each district to take action so as to limit the choice of varieties for future planting;
- (3.) To assist the nurserymen of the Province to better estimate the probable demand;
- (4.) To discourage extensive planting of new or little-tried kinds;
- (5.) To encourage the working-over of poor or indifferent varieties with scions or buds of those which are more valuable.

This revision has been necessitated by the additional information acquired since the last issue, as to the commercial suitability of varieties, taking into consideration all that has been learned about their commercial suitability, their adaptations to various soils, success in different districts, immunity to fungous diseases, etc.

The market question has been made a real problem by the recent increased production in the United States and Canada generally, and in the North-western States especially. The general range of prices received in 1910-1912 has been somewhat lower than in the period 1905-1909, in some instances very much lower. At the same time, there has been a steady increase in the cost of labour and of living. These two circumstances—a rising cost of production, and a lower selling price—make it imperative that more care be taken to select the most suitable varieties, and to plant them under the most suitable conditions.

Variety lists were issued by the Provincial Board of Horticulture in 1908 and 1910.

### SOURCES OF INFORMATION.

In the compilation of this list a great many sources of information have been drawn upon. First of all, there has been the experience of the members of the Board of Horticulture, which, as the fruit-growers of the Province are aware, is composed of practical fruit-growers, representing the principal districts—men who are in an especially good position to know what is best.

The advice of other prominent fruit-growers and of fruit-shippers throughout the Province has also been drawn on to a large extent, and the Department of Agriculture and the intending fruit-grower owe much to them.

The staff of the Horticultural Branch of the Department, as designated elsewhere in this bulletin, has been called on for information. These men, by virtue of their continual observation in the orchards, in the fruit fairs of the Province, and

In the packing-houses, together with the many discussions which they are able to have, both at meetings and privately, with orchard-owners, are in a position to render especially valuable opinions.

The Markets Commissioner, stationed in the Prairie Provinces by the Provincial Department of Agriculture, to study conditions under which our fruit is marketed and the competition which it must meet, has also advised on the marketability of the various varieties—a most important point.

#### FRUIT-GROWERS' ASSOCIATIONS HAVE ASSISTED.

In this past year, the British Columbia Fruit-growers' Association has also taken considerable interest in the variety question. At the last annual meeting of this Association, held in January, 1912, a resolution was passed, and it, together with the discussion on it, is reproduced herewith:—

“Moved by B. McDonald, seconded by D. H. Watson, ‘Whereas the shipping associations of British Columbia consider it of great benefit to the fruit-growers to confine their planting to fewer commercial varieties more suitable to their districts: Be It Resolved, That the Association ask the various affiliated associations to recommend lists of varieties for commercial planting in their respective districts to the Board of Horticulture for the 1912 revision of the lists of varieties recommended.’

“Mr. McDonald: In speaking to that resolution, I think every fruit-grower of British Columbia realizes the great importance of getting our planted varieties down to the required number. I would instance Hood River as an example of what I mean, and I think the sooner British Columbia fruit-growers do the same thing, the sooner will they achieve the success they are after.

“Mr. Watson: I do not think the question requires much argument. Just consider Watsonville and Hood River. I think it is up to British Columbia fruit-growers to adopt the same principle.

“Mr. Bulman: I thoroughly endorse the idea of the resolution, and I think that the investigations of Mr. Winslow in this direction are to be commended, and I would like to see them extended.

“Mr. Maxwell Smith: I may say that never a week passes but I am asked by some new-comer what are the best varieties to plant, and I think that a list such as is proposed would meet a long-felt want.

“The resolution carried unanimously.”

In compliance with this resolution, the various affiliated associations of the Province gave considerable study to the question of varieties for their respective districts, and their recommendations are incorporated in the list of varieties given.

#### DEPARTMENT HAS INVESTIGATED HISTORY OF VARIETIES.

The Department of Agriculture, in drawing on the sources of information indicated above, will be seen to have done practically everything possible to secure what experience could tell as to the conduct of the different varieties of fruit. Owing, however, to the very rapid development of our fruit industry in the newer districts, and to the fact that even in our older districts the industry is still very young, there are very many gaps, for which experience and experiment on the ground cannot as yet supply the exact information, and it has been both advisable and necessary to make some investigation of the requirements under which various varieties of fruit reach their greatest perfection elsewhere.

It is a well-recognized fact that each variety of fruit requires a certain type of growing season to reach its greatest commercial perfection, and to approach reasonably to this ideal the growing season must be nearly like that which it has been found to be most desired. Drawing on the records of the meteorological stations of this Province and of Ontario, Nova Scotia, and the North-western States has enabled us to study those conditions under which the different varieties seem to succeed best. Many varieties of all kinds of fruits were found to be adapted to a very limited range of climate, such as the Spitzenberg, Whinsap, and Pewaukee apples, the French prune, the d'Anjou pear, the Foster peach, and the Olivet cherry;

while, on the other hand, there are varieties, such as the Wealthy, Wagener, and Ben Davis apples, the Bartlett pear, the Elberta peach, and Pond's Seedling plum, thriving over such wide areas as to well deserve the term "cosmopolitan," as against the "sectional" character of the great majority. The demonstrated success or failure of many varieties in parts of our own Province has strikingly confirmed our expectations based on their behaviour in similar climates. This method of studying climatic conditions and varieties has led to some interesting and valuable suggestions which we are following out in distributing varieties of trees for experimental purposes in our new and untried districts. What is more important, we have been able to verify the wisdom of choice in the case of certain largely planted kinds. It was learned that the principal features of the growing season are:—

- (1.) Its length:
- (2.) The total number of heat units received:
- (3.) The mean temperature of the hottest six weeks.

These are all to be derived by a calculation of records of the daily maximum and minimum temperatures along the lines laid down by the United States Department of Agriculture's Biological Survey. For example, choosing the section in which the Winesap apple reaches its greatest perfection, we find that it requires a growing season of 225 days, with a total of 13,400 heat units, and a temperature for the hottest six weeks of the growing season averaging 72° Fahr. Under such conditions the Winesap bears heavily, produces fruit of the desired commercial size, and of very high colour. Where the season is shorter or less warm, the fruit lacks in size, colour, and dessert quality, in proportion as the season falls short of these requirements. We find only a few districts in British Columbia approaching these conditions. The records for Kamloops show that the Thompson River Valley has an average of 214 growing days, 12,683 heat units, and a temperature in the hottest six weeks of 69.30° Fahr. The Similkameen Valley, of which we have unfortunately no records, we believe to be even more nearly suitable, and this is verified by the fact that Winesap trees in that section are producing heavy crops of fruit of good size and colour. In no other part of the Province of which we have record do we find conditions under which the Winesap is likely to reach the desired perfection. This variety, owing to its great favour in Prairie and Coast markets, is being planted to an undesirable extent in many districts where it may not do very well; and intending planters should bear the above facts in mind. The laws of nature are inexorable; and the attempt to grow varieties in unsuitable districts cannot be attended with success.

The McIntosh Red apple is produced to greatest perfection in districts with about 200 growing days, 11,400 heat units, and a temperature in the hottest six weeks of 65.5° Fahr. Our investigations show that Vernon has 199 growing days, 11,423 heat units, and 66.5° Fahr. as the average temperature of the hottest six weeks. It will be seen that Vernon approaches the ideal very closely. Kelowna, with 201 growing days, 11,567 heat units, and 66.0° Fahr. as the average temperature of its hottest six weeks, is also very nearly ideal for this variety. The summer temperature in both cases being a little on the warm side, the keeping quality of the fruit is not quite as good as it might be.

Turning to Nelson, we find there an average of 202 days in the growing season, 11,427 heat units, and an average six weeks' summer temperature of 65.0 degrees. We would expect that, with this lower summer temperature and a slightly longer growing season, the keeping quality would be better. The greater humidity at Nelson, which we find, when we turn to the records of precipitation, induces the apple-fungus, known as scab, which is a qualifying factor in this instance.

Turning to Victoria, we find this section to have 271 growing days, 14,400 heat units, and a temperature of 60.8 degrees in the six hottest weeks; obviously, in every respect the climate is not a suitable one for the McIntosh Red.

Similar investigations enable us to verify the results of experimental observation with respect to many of our varieties, which gives us confidence in the results of this method of investigation. The methods by which the figures are derived,

and by which the suitability of the district are judged, are much too intricate to be dealt with here. The examples will serve, however, to show that the investigation has gone into the question much more deeply than can commonly be done. There can be no question as to the essential accuracy of the deductions, but until the material collected on the subject can be published, only the conclusions as embodied in the variety list herewith can be submitted at this time.

## FACTORS INFLUENCING CHOICE OF VARIETIES.

### (1.) THE GROWING SEASON.

The character of the season of growth is undoubtedly the most important factor of all those connected with the choice of a variety. The "growing season" is really the summer climate of the district, and it is well known that the summer climate of different districts may vary a great deal, not only in length, but in temperature, amount of sunshine, amount of rain, wind, etc.

In the choice of varieties the length of the growing season is important, because many varieties otherwise entirely suitable cannot reach maturity in an insufficiently long season, such as is often found in a high altitude, though even on the same altitudes different districts show great variation.

The Yellow Transparent, Duchess, and other early apples thrive in seasons so short that the Northern Spy, Jonathan, and other varieties cannot possibly reach proper maturity. It is practically useless to plant the late winter varieties, except a very few unusual kinds, in those sections where the growing season is under 180 days. On the other hand, in the sections of longer growing season, combined with high summer temperatures, the early varieties become very early indeed, and very perishable. In seasons shorter and cooler the fall varieties may become winter keepers.

The temperature of the growing season is of almost as much importance as its duration, and the two naturally go together. Such varieties as the Winesap will not mature properly in a season, no matter how long, unless the summer temperature is sufficiently high; while other varieties, such as the Blenheim Orange, King, Ribston Pippin, require a reasonably long growing season, but it must also be reasonably cool, high summer temperatures injuring their keeping quality and also their flavour.

The relation of sunshine to varieties is also of importance. On the Coast, the months of September and October are usually hazy, and while the sun may be visible, the sunshine is not strong. Under these conditions, many sun-loving varieties, such as Jonathan and Spy, refuse to colour up well, while others, especially those varieties of English origin, gain their usual colour.

The humidity of the air, while a factor which is not readily susceptible to observation, has a great deal of influence on the choice of varieties. Where the air carries a high percentage of moisture many fungous diseases thrive, and in consequence those varieties of apples which are susceptible to such diseases should be avoided. It is on this account that the Snow apple, so subject to apple-scab, is usually badly deformed in Coast regions, and the Flemish Beauty pear is practically impossible to grow in these sections on that account. For such sections varieties originally propagated and developed under similar conditions are most likely to be resistant, and to bear clean fruit.

In other districts, such as the humid sections of the Interior, the relative humidity is not so great as on the Coast, and it is quite possible, by reasonable care in pruning and spraying, to grow susceptible varieties with very satisfactory success. In the Dry Belt, where the humidity is naturally low, and evaporation therefore greater, the skin of the apple becomes thicker and stronger, making it more adaptable for shipping. In this climate fungous diseases are almost unknown, and this factor need not be considered in the choice of varieties. On the other hand, some physiological troubles seem to thrive most readily in the non-humid sections, and varieties susceptible to them should be avoided. In this section, too, those varieties

which thrive best under irrigation methods should be chosen. There are some varieties which do best under irrigation; others require humid conditions; others have no preference.

The total precipitation, including both rain and snow, is the principal factor in determining whether irrigation will be necessary or advisable. In regions of excessive precipitation drainage is necessary for practically all varieties of apples, but there are some few kinds which seem to do much better than the average in low or otherwise wet locations, such as Ben Davis and Golden Russet.

The months of greatest precipitation are also of importance. Some districts receive their precipitation principally in the winter-time, and there is in consequence not enough moisture in the summer-time, without irrigation, to bring many varieties of apples to commercial size, while other varieties, such as Duchess, Alexander, Wolf River, and King, will grow quite large enough.

In those districts which have a limited summer precipitation without irrigation-water available, such early maturing fruits as strawberries, cherries, and early plums will succeed commercially, while longer season fruits, such as winter apples, would be unsatisfactory.

It is because of the lack of summer moisture in Victoria that raspberries do not succeed as well as strawberries, and similarly in the Lower Mainland, where the moisture-supply continues later into June, raspberries are more successful, while the strawberries are softened by the rain.

Heavy rains in the blossoming season are injurious to fruit setting, and are undesirable. Heavy precipitation in May and June lends itself to fungous diseases, while heavy precipitation in September and October, such as is found in some districts, materially interferes with the keeping quality of apples, their colour and maturity. This question of the seasonal precipitation is a most important one in the commercial production of fruit.

Wind, or the absence of wind, is in some cases an important consideration. The valley winds, characteristic of many sections near mountain-ranges, materially help to prevent frost, but heavy winds cause injury by bruising cherries and other soft fruits, and by causing apples to fall. Persistent winds from one direction make tree-pruning a difficult matter, and wind-breaks may be essential to the success of an orchard in such cases.

Late spring and early fall frosts are material factors in choosing varieties of fruit. In a section where late spring frosts are likely to occur, it is not advisable to attempt peaches, Japanese plums, or cherries on a large scale, while walnuts, apricots, and almonds require unusual freedom from late frosts. Early frosts in the fall, if not too severe, are of material value in increasing the colour of late apples, though extremely heavy early frosts are liable to damage nearly all kinds of fruit, not excepting the hardest of winter apples.

Hail is not unknown in the Interior of British Columbia, and may cause some loss, but its occurrence is so rare that it effects no material damage, as in some parts of France, where it is the cause of great loss to the grape-growing industry.

Cloudiness, fog, and haze, which are more or less likely to occur on the Coast, have an undesirable effect on many kinds of fruit; and on this account, locations which, because of altitude, exposure to the south, and prevailing winds, or other reasons, are most free from these, are likely to produce the best fruit.

## (2.) RELATION OF WINTER CLIMATE TO THE CHOICE OF VARIETIES.

The average snowfall is reasonably constant throughout each district of British Columbia, and may be reckoned with as such. In those sections where snowfall is very heavy, amounting to 3 or 4 feet on the level, it is more desirable to have varieties of trees which do not break down under the weight of snow. This can be overcome to a considerable extent by proper methods of pruning, but not successfully by high heading, as is sometimes attempted. In all Interior sections where winter temperatures may drop low, it is most desirable to have some snow covering to protect the soil and to prevent root-freezing. In the irrigated districts the melting snow supplies moisture for the early spring months, and where it is a fairly constant



factor, as at Vernon, irrigation is not necessary as early as where snowfall is much lighter, as in the southern end of the Okanagan Valley. On the Coast snowfall is rare, though some sections, particularly in proximity to the mountain-ranges have more or less.

The minimum winter temperature is one of the principal determining factors in choosing varieties of fruit, especially in the Interior. In the Coast regions, where zero temperatures are rarely encountered, practically all the varieties of the temperate regions can be grown, as far as this factor is concerned, with equal success; but in the Interior it is very necessary that varieties be chosen which are likely to stand the minimum winter temperature without damage. The blossom-buds of practically all varieties of peaches are frozen by a temperature of 14 or 15 degrees below zero, and, in consequence, peaches are successful only in a limited number of areas. The buds of cherries, especially some sweet varieties, suffer at slightly lower temperatures, while the tenderer apples, such as Newtown, Splzenberg, and Cox's Orange, are apparently injured at around - 25 degrees. The McIntosh and Wealthy stand as low temperatures as are experienced in any of our old fruit districts without injury to either wood or fruit-bud. In more northerly or higher sections, even hardier kinds must be used.

In the variety list submitted, the question of winter injury has been given almost first consideration, and the varieties given may be counted on to stand practically free from winter injury. In some of our principal fruit-producing sections, winter injury of tender varieties has been the cause of greater loss than all other factors combined, but experiment has proceeded so far that this factor becomes almost negligible in the planting of new kinds.

The duration of periods of low temperature, and the amount of wind with which they are accompanied, should be considered with absolute minimum temperatures, in considering the effects of freezing, as the duration of the freeze and the amount of wind add materially in causing injury.

The humidity of the air in winter is a great factor in the amount of injury caused by freezing. The greater the humidity, the less injury is caused. This factor has, however, been also considered in recommending choice of varieties.

### (3.) ALTITUDE.

The higher the altitude, the shorter the growing season and the cooler the summer. Many varieties of fruit in higher altitudes become inferior in size, in colour, and particularly in productiveness. It is true, however, that the higher in altitude any variety can be successfully grown, the better is its texture and keeping quality. Practically no fruit is being produced in British Columbia over 3,500 feet above sea-level, and it is very unlikely that commercial fruit-growing can be conducted successfully over 2,000 feet, except in specially favoured locations where, either from the topography of the land or the mildness of the climate, or exceptionally remunerative local markets, the detrimental effects of high altitudes are discounted.

None of the Interior fruit sections of British Columbia have an altitude of less than 500 feet, and the average altitude at which fruit is being produced in largest quantity commercially at the present time is between 1,200 and 1,400 feet. The fruit produced at 1,600 to 2,000 feet is, however, notably good in keeping quality and for dessert purposes. At the higher altitudes many varieties, which are only fall apples ordinarily, become good Christmas or even late winter apples.

### (4.) THE INFLUENCE OF THE ORCHARD-SITE ON THE CHOICE OF VARIETIES.

The proximity of the orchard to large bodies of open water has many beneficial effects in the prevention of frost, in the modification of winter temperature, and in increasing the humidity of the air. Such a location is desirable for practically all kinds of fruit, but is especially desirable where tender varieties or those subject to frost are most desired. The presence of deep water is one of the best forms of insurance, in planting any kind of fruit, against vicissitude of climate at any

time of the year. At the same time, proximity to the sea carries these good qualities to an extreme, reducing the summer temperature so greatly that grapes, peaches, and other fruits requiring high temperatures in summer, do not thrive, and winter apples take a long time to properly mature.

The slope of the land is important. A reasonably level orchard costs less to operate. On the Coast, the most desirable slope for practically all kinds of fruit is that to the south or south-west, so as to secure the benefit of all the sun possible. In the Dry Belt, such an exposure lends itself too readily to sun-scald, and on extreme south-west slopes this may become quite serious, even with low-headed trees and hardy varieties. Too great a slope increases the cost of irrigation (and the danger of washing), as does an uneven slope or an absolute absence of it. Grading is often necessary in irrigation districts to ensure a proper flow of water. A slope to the east or south-east renders the fruit, plums especially, more susceptible to spring frosts, and so is not desirable where spring frosts are liable to be prevalent.

Elevation above the low-lying land of a district greatly facilitates air-drainage, and so assists in avoiding spring frosts in every district, while on the Coast, as stated above, it helps materially in securing freedom from fog.

In districts with prevailing winds or heavy winds from any particular direction, it is desirable to have the orchard protected from such exposure, or if an orchard is planted in such a location, the varieties should be those which resist such conditions to best advantage. The Wealthy, McIntosh, Snow, and some other varieties drop readily before maturity in a high wind, while others, such as the Crabs, Wagener, Winter Banana, Yellow Newtown, and Golden Russet hang well to the trees under such circumstances. Transcendent crab, in the Interior, and Hyslop crab, on the Coast, are good varieties for the exposed side of the orchard.

While on the Coast a slope down to the water and facing south-westerly is, as a general rule, most desirable for apples, for strawberries it may be detrimental, because of the exposure to the prevalent south-west wind of that section. In the Interior, it is a general rule that a slope down to an open body of water should be chosen; where this is available, the other considerations as to site are secondary.

### (5.) FRUIT-GROWING SOILS.

The Province has soils of a great many types. Speaking generally, in the whole of the Coast region the soils which are suitable for fruit-growing are nearly all of glacial origin, while in the Interior practically all are of an ancient alluvial character, either being on the floor of prehistoric lakes, or the wash of more recent mountain-streams. In both cases there is a wide variation of type, whose influence on fruit-growing we are just beginning to understand. Much in this respect has yet to be learned by experience, but we are able to make some definite recommendations at this time.

### (6.) THE TYPE OF SOIL.

On light or sandy soils, early maturing fruits and those whose roots naturally require a light soil, such as peaches, plums, and apricots, are likely to do best. On the clay loams and slightly heavier soils, many varieties of apples are thriving to their greatest perfection, while pears; on distinctly heavy soils. Clay soils, with heavy clay subsols, are not at all suitable when they do not yield up their moisture readily to the tree or to the plant, and on such soils strawberries are extremely likely to suffer from want of moisture, even though a great deal may be present. As strawberries, however, require a considerable amount of moisture, the soil should be retentive in character. Blackberries and currants prefer a low, moist, fairly heavy soil, while raspberries require it well drained, but still deep and moist. Under irrigation conditions these factors are all modified somewhat, but the type of soil is one which should be given due consideration in the planting of all kinds of fruits.

There has been very much indiscriminate planting of fruits on very light, gravelly, or open soils, on which trees may do well for a few years with sufficient cultivation or water, but where eventually failure seems certain. Soils of basaltic origin or of quartz are likely to be open and poor in potash, while those of feldspathic

type are usually rich in both potash and lime, though variable in phosphoric acid. For practically all fruits it is desirable to have a type of soil which carries a quantity of plant-food in a reasonably available form.

Whatever the soil, it should be reasonably deep. Sour cherries, and in some cases strawberries and plums, may do well on soils which are rendered shallow by the presence of hard-pan, impervious clay subsoil, or rock; but on such soils apple-orchards are likely to be short-lived, poor in results, and extremely liable to winter injury. Shallow soils have not sufficient reservoir for moisture, nor have they any reserve of plant-food, and they should be avoided for what are intended to be long-lived orchards to a far greater extent than they have been in the past.

The depth of soil is a subject which receives practically little or no consideration from the intending planter, yet it is one on which the future of the orchard very largely depends.

The amount of decayed vegetable matter or humus in the soil varies greatly in different districts. Humus is almost absent in Dry Belt soils, but what there is is four times as rich in nitrogen as the average humus of the soils of humid regions. Soils which have been newly cleared of coniferous timber are deficient in humus, and what there is is undesirable, because of its acidity and rawness. Those soils which have borne a natural growth of willow or alder have more humus, and consequently more available nitrogen; but, generally speaking, nearly all our soils lack in this essential constituent, and it must be supplied at some time, either before the orchard is planted or in its early years. If humus is lacking, the roots of fruit-trees, which are very much more delicate and exacting in their requirements than the roots of forest trees—general opinion to the contrary—make much less growth, and the trees in consequence do not do so well. Practical experience proves that humus should be supplied early in the life of the orchard, and, preferably, a crop of clover, vetch, alfalfa, or peas should be ploughed down in the fall before the orchard is planted.

In most sections the presence of a supply of sub-irrigation moisture, or seepage, will be of great benefit if it is not in too great quantity or too near the surface. We find apple-orchards on the Coast doing best where there is such subsoil moisture as will ensure a supply during the dry summer. Such seepage is also giving good results in sections of the Interior, but where subsoil moisture is in apparent excess for the average apple-tree, pears may be planted with satisfactory results.

On soils which show alkali, or which will be subject to alkali, through seepage or over-irrigation, the best varieties of pears should be planted rather than apples, because the pears stand alkali much better. Where alkali is present in considerable quantity, the grape, which is more resistant even than the pear, will still do well. The peach is not at all resistant, and its planting on such soils should be avoided.

The drainage of the orchard-site should be good. Where it is desirable to have a home orchard on low soils which are unsuitable for commercial orchards, those varieties of apples such as Golden Russet and Ben Davis, which are specially resistant to soil-moisture, should be chosen.

#### (7) THE POLLINATION PROBLEM.

It has been learned within comparatively recent years that the pollen of one variety of apple may not be potent on the blossoms of the same kind, though quite efficient on another variety. There have been found but a few varieties of apples and of pears which are self-fertile, and occasionally instances have been found where the pollen of certain varieties will not fertilize any other variety on which it has been artificially tried. The study of pollination has solved many problems as to the failure of orchards, especially those of a single variety, to bear normal crops of fruit. Such studies also indicate the best varieties for planting together to secure best results, but only in the district in which the experiments are conducted, as is shown by the widely different conclusions of experimenters. The results of investigators in other Provinces and States are therefore not presented here.

No pollination studies have been conducted in British Columbia, this being a subject of scientific investigation for which we have not as yet had the facilities.

Under the circumstances, our recommendation to each intending planter is that he put in from three to five varieties of apples in blocks of not more than four rows of each kind, so as to permit bees to cross-pollinate them. It has been found, we might add, that cross-pollination very often increases the colour and the size, as well as the quantity of fruit produced. To pollinate successfully, varieties must bloom at the same time. Practically all the fertilization of fruit-blossoms is done by bees, of which every fruit-grower should keep a few colonies for the purpose.

#### (8.) THE INFLUENCE OF VARIETY CHARACTERISTICS.

Presuming that we have the most favourable climatic and soil conditions to produce several varieties of fruit to their best individual advantage, we must decide on those varieties which have the greatest number of desirable characteristics. If, for instance, Spitzenberg and Winesap are each suited to certain soil and climatic conditions, we would unhesitatingly choose the Winesap, because it will usually bear three boxes to one of Spitzenberg. If in bearing qualities the varieties are equal, we would choose the one which is an annual bearer, against the variety which bears only every alternate year. In the consideration of the varieties recommended, we have given consideration to the growing habits of the different types of trees, their vitality, their method of growth, their relative costs for pruning, their usefulness as permanent trees or as filler trees for interplanting between the permanents, their bearing habits, whether they bear at an early age, as does Wealthy, or very late in life, as with Northern Spy, or medium, as is the case with McIntosh. Only a few varieties are recommended here which have the biennial-bearing characteristic, as have Blenheim and Baldwin.

In respect to the character of the fruit, there is to be considered, besides quantity, its quality, colour, size, uniformity, and freedom from blemishes. Supposing the yield of fruit from two varieties to be equal, we would prefer that which produces the greatest percentage of high-class fruit and the smallest percentage of cull fruit. Practically no varieties are recommended which are not of high quality, of good colour, desirable size, producing uniform fruit, though there are considerable variations which must be taken into account in choosing the varieties for any particular section.

All of the factors above discussed in reference to the choice of varieties have to do with the cost of production. Our aim is to choose that group of varieties of which the unit cost of production per box will be the lowest. It is of no value to produce magnificent fruit if the cost of production is to be greater than the selling price. We know of no varieties which are likely to be more remunerative than the ones which have been chosen and published in this list.

Turning to the question of the relation of variety to the selling price, we have found it necessary to consider a number of factors which materially influence the choice, and which are discussed fully.

#### (9.) PROSPECTIVE PRODUCTION.

The people of our fruit districts are only beginning to realize that, important as it is for any grower to limit his list of varieties, it is equally important to each grower, and to all of them as a whole, that the number of varieties planted in the entire district be also reasonably limited. One of the greatest handicaps our young districts have is a production of such wide range of varieties as to disgust the buyer and discourage the market. In such cases there must be a general campaign conducted by the broad-minded men of the locality, to induce the owners of miscellaneous varieties either to pull out the trees or top-work them to the most desirable kinds.

The orchard survey of the fruit sections of the Province, made in 1911 and 1912 by the Department of Agriculture, has shown in a striking manner the great disadvantages under which some districts at present suffer, and will continue to suffer, from such miscellaneous selection. (See the Twenty-second Annual Report of the British Columbia Fruit-growers' Association.) This will be discussed under the heading of each district.

It must be pointed out that the districts which have been able to ship large quantities of favourite apples, such as Jonathan and McIntosh, have been able to command an average of 15 cents a box more than those districts which have but limited quantities of such kinds; and where there is a large proportion of undesirable or "odd" varieties, the effect has been to depress the price of the good varieties still further. In other words, the good varieties are used to sell the poor ones, and the planter of the good varieties suffers by just that much.

There is every reason for every district to limit its choice of varieties to not more than a dozen, which will amply cover the market. The individual grower should have not more than four or five if producing for car-load shipment.

When an intending planter must make a choice between two kinds, and other conditions appear reasonably equal, he should unhesitatingly choose that variety which has been most largely planted in the district. If this were done, it would materially assist in developing the production of the few best kinds.

The intending planter can inform himself as to what varieties have been planted most largely in his district. He is not able, however, to discover what are those varieties largely planted in other sections which will come into competition with him, and so is not in a position to judge whether any particular variety is liable to be produced in more than market requirements, or is likely to be in particular demand when his own come into bearing. On the question of the plantings made in British Columbia and the North-west States, which are our chief competitors in the box-apple trade, we have given this subject consideration, and in recommending the varieties indicated in the list have kept the influence of other plantings prominently in mind.

#### (10.) HOW MANY KINDS TO PLANT.

This depends much on conditions. If it is the question of supplying a local market or a special market which requires supply throughout the season, the grower would do well to plant all those kinds which are recommended for his district, even to the extent of seven or eight, or more. But for the greater part of the plantings to be made in this Province, where the market is a distant one, and where the fruit is to be handled co-operatively by the growers' organization, it is infinitely better for each grower to restrict himself to from three to five kinds. His first object in limiting the number of kinds is to enable him to study each kind and so get the utmost out of it.

We are reminded of a prominent pear-grower who said, after fifteen years' experience in growing the Bartlett pear, that he hoped in another fifteen years to understand just how that variety should be handled to best advantage in his locality. This is an extreme case; but it is a fact that each variety has its peculiarities, and that these peculiarities must be studied by the grower if he is to master them, and to mould them to his own use.

The kinds chosen must, however, be so adjusted as to make as even a demand as possible on outside labour, referring particularly to the harvesting. In this respect, it is better to have a series of varieties whose picking period extends over two and a half months than to have a group of varieties which must all be picked within two weeks. The question of supply of suitable labour is one of the problems of our fruit business, and its solution by the individual can be much facilitated by forethought in this connection.

Aside from the labour of picking, to have a few kinds lessens the cost of production in other ways, by lessening book-keeping, by lessening the amount of skilled labour required in pruning, which naturally varies in different kinds, and generally by all those little economies which come by producing a few things on a large scale, rather than a large number of things on a relatively smaller scale.

#### (11.) INFLUENCE OF TRANSPORTATION FACILITIES.

Fruit may be marketed by road, water, or rail, or all three; but, in any case, varieties must be chosen that will stand the transportation methods. It is practi-

cally useless to plant soft fruits where there is a haul of ten or twelve miles before the rail is reached. Similarly, fruit may be planted in a section so far from its possible markets that the transportation charges consume all the profits. The districts which require transfer from boat to rail, or a transfer en route on the rail-line, are handicapped over those which have main-line facilities.

These questions all have an important bearing on the success of the softer kinds of fruit, and the cost of transportation has an intimate bearing on the profits with every type of fruit. The reductions in freight rates and the improvements in shipping facilities which have marked the conclusion of negotiations between the British Columbia Fruit-growers' Association and the Canadian Pacific Railway are already proving a tremendous advantage to many of our districts. There is no way, however, of securing as cheap rates for a distant district as for one much nearer the market. There is a handicap in cost and time which can only be overcome by superior producing advantages or superior quality of fruit.

The Department will be glad to advise intending shippers of the present transportation rates, on both car-loads and less than car-loads, and both freight and express, to the different markets available for each district. The question of service is one which the intending planter can study for himself on the ground. He will understand readily the advantages of nearness to markets, in time consumed, in lessened handling, and in rates.

One fundamental feature of the evolution of the fruit-growing industry is the development of car-load shipments. These effect an economy in time, in rates, in handling, and in facility of marketing. Orchards so situated that they cannot readily make up car-loads for a number of years are handicapped to an extent which a man who has only reached the planting stage can scarcely realize. The assembly-rate principle, the adoption of which has been secured for our growers by the British Columbia Fruit-growers' Association, will be of some service to these scattered points, but the handicap cannot be entirely removed. The people of a new district should get together and plan the development of the district, as each does his own orchard, so as to secure shipment of straight car-loads at as early a date as possible.

## (12.) MARKETS.

The list of varieties selected must meet the market. This question is the one which receives first consideration, and in some cases entire consideration, the varieties being chosen entirely with reference to market requirements, to the entire neglect of cost of production and all that enters into it. We aim to choose varieties for which the net price received per box is as much above the net cost of production per box as possible. Those varieties for which higher prices are paid in the market are not necessarily the most profitable ones.

It is only a few years since certain varieties, then in the nature of novelties, fetched extremely high prices, and were in consequence heavily planted, and have now reached the market-level warranted by their intrinsic value. It is a serious mistake to plant a variety on the fashion of the moment. The effort should be to plant varieties which have real intrinsic merit, and which, from the character of the fruit, are likely to meet a stable market for a considerable period. It is not possible for any one to forecast the market indefinitely, but we endeavour to choose varieties which are likely to meet the requirements of our various markets, as far as we can at present foresee the demand.

The Canadian Prairie Provinces, Alberta, Saskatchewan, and Manitoba, furnish the logical market for the great bulk of the fruit produced in the Interior of the Province. The consumption in the Prairies is increasing tremendously with their rapid growth in population and in wealth.

Sour cherries are usually in great demand, but they must be marketed when the rush of sweet cherries is over.

We have never supplied one-half of the demand for strawberries, but require a greater organization, so as to ship car-load lots by express, to do much in this line.

The demand for raspberries, blackberries, and other small fruits is now largely supplied by imported fruit, and in this case, as in strawberries, the great necessity is for greater production and organization, so as to market in straight car-loads by express.

There is considerable outlet for a further supply of sweet cherries, but not of the softer and light-coloured varieties, the dark cherries being in demand.

Early plums have always paid a remunerative price, and as a rule late plums and prunes have also been very satisfactory. The latter are used more largely for preserving purposes, and on this account shipments should be made in the cheapest package—viz., the peach-box. Early varieties of peaches of nearly all kinds fetch remunerative prices, but later in the season only yellow-fleshed and freestone varieties are desired; indications are that, even with proper kinds, peach prices are likely to be comparatively unremunerative for several years.

It is likely that present plantings of peaches will largely take care of this market. In pears the demand has, as a rule, been very good, and fully warrants the extensive plantings made in recent years, and we believe, also, further plantings in those districts suitable for commercial pear-culture. The Prairie demand for apples, both early and late, has heretofore been very good, and is likely to continue so. As a rule, red apples are desired, and the higher grade and larger sizes, which find favour in the big cities, are not so much desired as medium-sized, well-coloured fruit at a moderate price. The varieties of apples recommended are calculated to meet this demand. Our problem will be to get our share of the trade, and do it at a reasonable profit.

Our great problem in the Prairie and Coast markets is most certainly that of our competition. The fruit of Ontario and Nova Scotia has a more or less distinct market of its own, but the North-western States, Washington, Idaho, Oregon, and Montana, compete directly with us in our own lines, and at the present time supply the bulk of the trade. It has been assumed that, as our production increased, these markets would come to us naturally and without difficulty by reason of our advantages of lower freight rates and the protecting Customs tariff. Actual experience in the past three years demonstrates that the task will be a much more difficult one. Our competitors to the south have several advantages, which at present more than offset ours mentioned above: an earlier season which enables them to supply the markets before our fruit is ripe; an older industry, with all that it means in skillful production, packing, and selling; lower costs of labour, money, supplies, and of living; an established trade in our natural markets, which they have supplied in larger measure than we have up to the present; and the control of many of the Prairie fruit-jobbing houses by one body of United States men and capital. Obviously, some of these advantages will be overcome naturally in the rapid increase of our production, but the market will not become ours without effort, and, perhaps, not without considerable expenditure for a separate distributing organization.

This American competition in the markets of Western Canada is perhaps the greatest problem of our industry to-day, and it promises to remain a big question for some time.

In observing the general trend of crops and prices as they will affect our future markets, it is worth noting that in the decade 1900-1910 the production of various soft fruits in the United States increased much more rapidly than the population. Plums and prunes increased 76 per cent.; apricots, 57 per cent.; cherries 43 per cent.; grapes, 100 per cent.; and peaches, over 100 per cent. Since 1910 the tendency has been to still further increase, the 1912 crop being much the largest yet produced and far exceeding 1910, which was the largest up to that time.

A similar increase in production has taken place in Eastern Canada, while the fruit industry of British Columbia has been practically created since 1900.

Under these circumstances of production, it would not be right to expect a general high range of prices for the soft fruits in our competitive markets, and this would affect us more severely than others, because of our present higher costs of production and the fact that our fruits come on the markets when prices are lowest.

Under such conditions as obtained in 1910 and 1912, when hundreds of car-loads of American fruit were consigned to the already overloaded Canadian markets, to be sold for what buyers would give, the effect was to force prices down, sometimes even below the barest cost of production.

The general outlook for apples and pears is more satisfactory. The production of apples in the United States dropped about 27,000,000 bushels in 1910 from the 1900 level, and while there is apparently some ground for the belief that production is once more on the increase, still the market may not be fully supplied for some time. The North-western States are our direct competitors in apple-production as in soft fruits, and their yields will increase rapidly in the next few years. While they had about 18,000 acres of apples in bearing in 1912, which produced about 15,000 car-loads, there are a total of 285,000 acres planted, which, if the whole were to succeed, might easily produce 50,000,000 or 60,000,000 boxes in 1920, which is about half the present production of the entire United States. As it is true, however, that only about 20 per cent. of this may be expected to arrive at commercial bearing, production will not be nearly so large as these optimistic estimates would indicate. It might easily happen, however, that prices will have to decline somewhat to bring the inevitable increase in supply into consumption.

It is possible that intending apple-growers should not base their plantings on the expectation of prices higher than an average of \$1 a box for good fruit. At such a figure there will undoubtedly be a satisfactory profit in bearing orchards in our proved fruit-growing districts.

To ensure results, the planting of orchards require the most careful selection of varieties, soil, location, and district. There must be, furthermore, constant and careful attention to the details of management and operations, having in view the greatest economy in production. There must also be economical and efficient marketing, which may be ensured by large shipments under the smallest possible number of competing organizations.

British Columbia Coast cities, which have been making marvellous growth of recent years, have far outstripped the supply of fruit grown on the Coast in practically everything, and it seems likely that plantings of all kinds that are reasonably suited to the Coast conditions will find a ready local market. The grower having little or no freight rate to pay, no duty, or inspection fees, is at a considerable advantage over his more distant competitors. The general demand of the Coast is about the same as that of the Prairie, save that prices are, as a rule, not quite so high; there is less demand for crab-apples, and there is more competition from cheap fruit peddled from door to door in the cities.

The Interior districts are beginning to look to the Coast to dispose of part of their output, to some extent for peaches, but largely for apples. The McIntosh, Jonathan, Wagener, and similar varieties, produced in the Interior, will find a very satisfactory market, which has been very largely supplied by foreign shipments up to this time.

Australia and New Zealand offer a very remunerative market for small, perfect red apples, and for pears suitable for November and December trade. Shipments have been steadily growing, and as more fruit of the kind required becomes available the high prices paid by this market will undoubtedly cause a great expansion in this trade, we believe to the possible extent of 200,000 boxes, in a few years.

China, Japan, the Philippines, and India have barely been touched as yet, but promise to take quite a large quantity of apples in a few years. Here, as in Australia, the demand is for the small, perfect red apple.

The demand in Great Britain, which we have only begun to cater to, is more for yellow than red kinds, but red dessert apples of certain varieties meet with ready sale. Yellow Newtown and Winter Banana from British Columbia sell particularly well. The facilities for shipment to England are good, and as our production increases the market will become a very large one. Reports from Canadian Trade Commissioners in South America and inquiries from houses there indicate that there is a growing demand for our apples in the large cities on the eastern coast of South



America. It is reasonably expected that this is a trade which can be entered to on the completion of the Panama Canal to greater advantage than at present.

#### COMMENTS ON USING LISTS.

In the use of the lists which follow, the following points should be observed:—

The list has reference mainly to the varieties of greatest commercial value, which are marked in each case with an asterisk, and to those most desirable for home orchard planting.

No attempt has been made to include those numerous varieties which may be of value for those local or special markets which are often to be found by the man who will enter to them.

The list for each district is not large. There are many other varieties which do well, and still others may be profitable. But there is a great economy in having but a few kinds rather than many.

Local associations, such as the farmers' institutes, the agricultural associations, and the fruit-growers' associations, should make strong efforts to influence the new plantings of the district. No grower lives to himself alone. His best choice benefits the district as well as himself. It is suggested that local organizations conduct a series of meetings, to make a choice of varieties for recommendation. In making this list, the Assistant Horticulturist for the district and the Department of Agriculture might very well be consulted. Having adopted a list, changes should be made in it only with the greatest care, and every effort should be made to give it publicity and to secure its adoption and use.

The list for home orchard planting is deemed fairly complete for the average home. There are many other good kinds which could be profitably included if the land and time and money are available for them. In all those cases where the intending grower feels that the list does not meet his requirements or his conditions, the Department will be at his service in advising on the kinds most likely to bring results. Letters on this subject should be addressed to the Provincial Horticulturist at Victoria.

*It is not recommended that each orchard-planter should put in all the kinds recommended for commercial planting for his section. Rather should he select the three or four which are best adapted to his own conditions, of location, soil, etc. If the entire list recommended for the district is considered by each planter, the effect will be to give the district a continuous line of fruit, to keep the packing-houses open and to supply the markets.*

It is far from being the intention of the Department, in issuing this list, to discourage experimental work with new or untried varieties. In every section of the Province there is much information to be had from testing both old and new varieties of all kinds. Such experiments, if conducted on a large scale, are almost certain to result in loss to the experimenter, great as their value to the district as a whole. Every fruit-grower might well do a little experimenting with a few varieties, but two or three trees of each kind are sufficient.

Even with the greatest care in its compilation, the list offered is not absolute. It cannot be accepted as final. It would be a mistake for any intending fruit-grower to take the recommendations for his district as applicable entirely to his own piece of land.

Our conclusions as to varieties, carefully as they may be made, may be materially changed in the course of years. We are only at the beginning of a real understanding of our different districts and their soils. The problem of markets has only been presented. Our markets have already established preferences for some varieties we do not produce to advantage, as, for instance, the Winesap, and things of this kind will continually have to be met and overcome.

The great problem in the search for suitable varieties is to find kinds to supply the late winter and spring demand for apples. We have no variety that altogether meets the requirements—a high-quality, long-keeping red apple of good size, borne on a hardy and productive tree. None of our present kinds meet these requirements fully enough.

## LIST OF DISTRICTS.

- (1.) Vancouver Island—South-east Section.
- (2.) Vancouver Island—West Coast.
- (3.) Maluland Coast.
- (4.) Northern Coast Valleys.
- (5.) Lower Maluland.
- (6.) Lytton, Lillooet, Spence's Bridge.
- (7.) Kamloops-Wallachin.
- (8.) Southern Central Plateau.
- (9.) Shuswap Lake.
- (10.) Upper Okanagan Lake.
- (11.) Lower Okanagan Lake.
- (12.) Similkameen.
- (13.) Kettle River.
- (14.) West Kootenay.
- (15.) East Kootenay.
- (16.) Central British Columbia.

### (1.) VANCOUVER ISLAND—SOUTH-EAST SECTION.

This district, roughly speaking, comprises the cultivable areas included in the boundaries shown on the map. The principal settlements of the district are those around Victoria, along the line of the E. & N. Railway, at Comox, and on the Gulf Islands contiguous to the east coast. A considerable proportion of this area, which is about 180 miles in length, may be cultivated, and much has already been cleared. The rural population at present might be estimated roughly at 15,000, and the principal industry is mixed farming, with dairying as its basis; poultry-keeping; and fruit-growing, the latter being largely restricted to the sections having reasonable transportation facilities.

The climate is essentially mild and moist, due to the influence of the Japan Current. The growing season is long, but cool, and the winters are damp and mild, with occasional frosts and rare freezes. The precipitation varies from an average of 28 inches annually at Victoria, 40 at Duncan, 42 at Nanaimo, to 70 at Alberni, the greater part occurring in the winter months. In the greater part of the district, precipitation in the summer is light, that for Victoria in June, July, and August being the lowest recorded for any point in Canada. The summer drought characteristic of the entire district is modified by the prevailing dampness of the air; the blooming season extends over a long period, and the blossoms, as in all Coast districts, are more subject to frost in consequence.

The soils of the district are very diverse in character, but are similar in being largely of glacial origin. Except in the lowlands, they are usually medium to light in character, and are often underlain with hard-pan at a depth of 18 to 30 inches from the surface. A red, sandy, gravelly loam is the most usual upland soil, and the one on which most of the fruit-growing is conducted. Most soils are deficient in lime, but have fair amounts of nitrogen, potash, and usually phosphoric acid, and respond readily to applications of manure and fertilizers.

The Douglas fir is the principal forest tree, and with it are associated more or less balsam, spruce, and cedar. The only British Columbia oak (*Quercus garryana*) is a characteristic feature of many landscapes around Victoria and the Saanich Peninsula.

The markets for the produce of this district are practically altogether local. Up to a few years ago, when the rapid expansion of the Coast cities began, it was expected that the Prairie would be the eventual outlet for fruit, but the rapidly increasing local population has now far outstripped the production of

nearly all kinds of fruit except preserving cherries, so that there is no need, either present or prospective, to look farther afield for a market. Competition in fruits on local markets comes very largely from the State of Washington, and to an increasing extent from the Interior sections of our own Province, but the handicap of duty and freight in the former instance, and freight in the latter, gives the local product an advantage which helps to offset some local disadvantages in the cost of production and the quality of the product.

The fruit-growing industry in this district had its period of greatest expansion in the years from 1904 to 1908. Experience has already begun to demonstrate that this development was, after all, more in the nature of an experiment, and some temporary set-backs, combined with great material prosperity in other lines and a tremendous increase in land-values, have operated to direct attention away from the possibilities of fruit-production. There has been some neglect of both young and bearing orchards, and this is a district where the best of care is absolutely necessary to profit.

The present production centres most largely around strawberries, principally the Magoon variety; preserving cherries, principally the Olivet and English Morello; plums and prunes of mixed varieties, but principally Black Diamond, Poud's Seedling, and Italian Prune; a few pears of numerous varieties; and apples quite largely Duchess, Wealthy, and King. Many varieties of winter apples have proven unprofitable, but many orchards planted to correct varieties have proven unprofitable because of unwise selection of location.

Given care in the choice of location and soil, with special reference to varieties and to markets, fruit-growing will be a profitable industry in this district. A great proportion of the cultivable area, however, should be retained for other forms of agriculture more adapted to its conditions.

The list of fruits recommended is as follows:—

Strawberries—

Excelsior—Early.

\*Magoon—Good, firm shipping berry; most useful kind grown here.

\*Sharpless—Valued for local market.

Warfield—Second early.

Raspberries—

Marlborough—Early crop.

\*Cuthbert—Main crop; fine commercial kind.

\*Loganberry—Profitable commercially for local market; fine for canning and preserving.

Gooseberries—

\*Oregon Champion—Small berry, but free from mildew and productive.

Downing }  
Industry } Good for home use.

Blackberries—

Snyder—Good quality; early.

Evergreen—Very productive and vigorous; late; quality low.

Red Currants—

Cherry—Large, but somewhat soft.

Fay's Prolific—Firmer, but smaller.

Preserving Cherries—

\*Olivet—The best commercially; a fine money-maker.

\*English Morello—Good for fillers in Olivet plantings.

Dyehouse—Earlier than Olivet and Morello.

Sweet Cherries—

Reine Hortense—Very early; soft; home use.

\*Royal Anne—Early; white; rather soft; good for home or local market.

\*Blug—Late; very good for home or any market.

Lambert—Very late; good, but light bearer.

Peaches—

- Hale's Early
  - Early Charlotte
  - Alexander
  - Early Crawford
- } For home use only; must be trained against walls to secure ripening.

Grapes—

- Moore's Early
  - Campbell's Early
  - Concord
- } Home use; must have sunny exposure and warmth to ripen.

Plums and Prunes—

- Peach Plum—Early and large; but soft and coarse and inclined to rot.
- Czar—Medium early; small; good cropper.
- \*Engelbert—Very good for home or market.
- \*Italian—Late; a general favourite.
- Victoria—Late; very high quality.
- Reine Claude—The best greengage.
- Shropshire Damsion—The best for jams.

Crab-apples—

- Hyslop—Does better than any other crab yet grown.

Pears—

- \*Bartlett—The standard early pear.
  - \*Louise Bonne—Small on dry soils, otherwise very good.
  - \*Rose—Scab-proof; high quality; October.
  - \*Clairgean—November.
  - \*Anjon—Very good.
  - Seckel
  - Comice
- } High-quality pears for early winter home use.

Apples—

- Yellow Transparent—Very early.
  - \*Duchess—Next early; gets size on dry soils.
  - \*Wealthy—Fall; must have medium moist soil.
  - Gravenstein—High quality, but takes much attention.
  - \*King—Best late apple here.
  - Grimes Golden
  - Blenheim Orange
  - Wagener
- } The most promising of late varieties.
- Cox's Orange—A good, small dessert apple for November and December.

(2.) VANCOUVER ISLAND, WEST COAST.

The boundaries given for this district are as indicated on the map, and show in a general way the area included. The list is given as a suggestion for those sections which have the conditions here described. The climate is quite moist, being exposed more or less to the full sweep of the Pacific, with an annual precipitation of from 70 to 125 inches, practically all in the form of rain, occurring most largely in the winter months and least in July and August. The summers are cool, though July and August have considerable sunshine. The great precipitation and the high relative humidity throughout the year make fungous diseases especially troublesome to the fruit-grower, and even with those varieties recommended below, which are least subject to such diseases, the task of producing clean fruit is not easy.

Inside the boundaries given on the map there are many sheltered districts, where, because of elevation, good soil-drainage, exposure to the sun, and freedom from frosts and fog, the conditions are more like those obtained in District No. 1, and where this is the case the variety list given for that section may be safely followed, due consideration, however, being given to transportation facilities.

The soils of the district are very much like those of the south-eastern half of the Island, as described above, but have been subject to much greater washing and leaching of plant-food. The greater precipitation in spring, summer, and autumn months renders them much less liable to drought and adapts the district for dairying.

The west coast is comparatively a new country, which has been much handicapped by lack of transportation. The local population is small, but the local fruit-production at present does not supply its demands. Most hardy fruit consumed in the section is supplied by Victoria fruit-jobbers.

Commercial production of fruit for shipment is not likely to be undertaken, but it is eminently desirable that the home orchard in this district, such as will supply at least the bulk of the fruit used by the farmer, should receive consideration.

The list of fruits recommended is more or less tentative in character, but an effort has been made to name those varieties which are likely to thrive best under the conditions.

Strawberries—

Warfield—Earliest.

Clark's Seedling—Firm; late crop.

Dunlop—Second early.

Raspberries—

Cuthbert.

Loganherry.

Gooseberry—

Oregon Champion.

Blackberries—

Snyder.

Evergreen.

Red Currant—

Cherry.

Sour Cherry—

Olivet.

English Morello.

Peaches—

Early Charlotte

Early Crawford

} Must have sunny wall.

Grapes—

Moore's Early—Must have sunny wall.

Plums and Prunes—

Englebert

Monarch

} Small plums, but fairly clean growers.

Reine Claude—For preserving, etc.

Shropshire Damson—For jam-making.

Crab-apples—

Hyslop.

Pears—

Bartlett—A cosmopolitan variety worth trying.

Boussock

Bosc

} Scab-resistant; good croppers.

Anjou—Late; high quality; worth test.

Kciffer—Long-keeping.

Apples—

Yellow Transparent—Very early.

Duchess—Second early.

Wealthy—Early fall.

Alexander—Early fall; cooking.

Gravenstein—Fall; dessert.

King—Early winter; dessert and cooking.

Canada Reinette—A clean-growing early winter yellow apple.

Wagner—A cosmopolitan winter apple worth trying.

(3.) MAINLAND COAST.

Reference to the map will show that there has been included in this district the greater part of the Coast region of British Columbia, including the north-east half

of Vancouver Island, with adjacent islands, and the mainland coast from Howe Sound north to Bella Coola. In this great area settlement is sparse, and the energies of the settlers are largely devoted to lumbering and fishing. There is one agricultural community of long standing, viz., that of Bella Coola, but only a small portion of the Bella Coola Valley is similar in conditions to the greater part of the Coast.

Of the climate we have very few records. They indicate that in general it is very moist, varying from 50 to 140 inches precipitation, with long but cool growing seasons, and wet and occasionally cold winters. Great variations in conditions exist, but so little development has been done, and that so recently, that little definite information can be recorded as to climate.

The soils are largely gravelly, and much of the same character as described for Vancouver Island, but there are large areas of gravelly soil, as well as many deltas of small size, now heavily timbered, composed of rich, deep, and fertile soils. As on the west coast of Vancouver Island, timber is very heavy, and the cost of clearing very great, while transportation facilities for the greater part of the territory are meagre.

The market available is a local one, and is far in excess of the local attempts to supply it in any foodstuffs, while the fruit grown meets a very ready sale in competition with fruit distributed out of Vancouver and Victoria. The present production of fruit is quite small, and not very much planting of trees has been done as yet.

The list suggested for settlers on the West Coast of Vancouver Island is recommended for this district also, the conditions being similar.

#### (4.) NORTHERN COAST VALLEYS.

This district includes the agricultural areas lying in the lower valleys of the Nass, Kitsumgallim, and Kitimat Rivers, and Lakelse Lake. This is a new district, attention to which has been attracted because the Grand Trunk Pacific cuts through it between the Lakelse and Kitsumgallim Valleys. In size, none of these valleys are large, but there is a total of probably half a million acres of land which will eventually be brought under cultivation.

The climate is unusually mild for a district of such high latitude, but it is not nearly so moist as the Coast regions, only a short distance away, beyond the Cascades. The total precipitation is probably between 30 and 50 inches, and a great deal of it comes as snow, which lies from December till March over the entire area. The summers are warmer than on the Coast, and June is the only summer month having considerable precipitation. The winters, while fairly long, are mild, probably not more severe than at Nelson, in this respect being suitable for many kinds of fruits. The growing season, while of moderate length, is cool. No figures have been kept as to either temperature or precipitation.

The soils are extremely variable, and are largely composed of the wash of the mountain-sides into the valleys. A great deal of the soil is of the highest quality, though much of it is underlaid with open gravel, which detracts considerably from its agricultural value.

The timber is not heavy, but under present conditions of labour would cost from \$100 to \$125 an acre to clear, and proportionately less as the district becomes more settled and the cost of labour equalizes with that farther south.

The market for whatever this district can produce lies at its door in the growing city of Prince Rupert, and along the line of the G.T.P. east to Edmonton. Interest centres in this district because it is likely to be the only large area in the north which will produce a wide range of fruit in such commercial quantity as to compete with the fruit from farther south, which it would be enabled to do by its advantage of position. Prince Rupert is now supplied altogether with fruit by boat from Vancouver, and the strawberries produced in this district for the past three years sold at an average of \$6 per 24-lb. crate delivered at the boat on the Skeena River.

The local population is small, but there was practically no one resident in the district five years ago. The land is largely held by pre-emptors and by land com-

panies under purchase. Very little clearing has as yet been done, and the Department of Agriculture's experimental trees, planted during the last two years, form the majority of the trees planted.

The list of fruits recommended is not, therefore, given from local experience, but is designed to be of use as suggesting those varieties which are likely to do well in the district, and to find favour in the markets in competition with southern fruit.

Strawberries—

Magoon.  
Wilson.

Raspberries—

Cuthbert.  
Herbert.

Red Currants—

Red Dutch.  
Ruby Castle.

Gooseberries—

Champion.  
Red Jacket.  
Whitesmith.

Sour Cherries—

English Morello.  
Early Richmond.  
Osthelm.

Sweet Cherries—

Reine Hortense.  
Royal Anne.  
Bing.

Plums and Prunes—

Czar.  
Monarch.  
Reine Claude.  
Englebert.  
Shropshire Damson.

Crab-apples—

Hyslop.  
Transcendent.

Pears—

Bartlett.  
Bosc.  
Clairgeau.  
Anjon.

Apples—

Yellow Transparent.  
Duchess.  
Wealthy.  
Alexander.  
Wagener.  
McIntosh.  
Scott's Winter.

(5.) LOWER MAINLAND.

This district embraces what is usually known as the Lower Fraser Valley. It is the territory tributary to New Westminster and Vancouver. In size, it is about 130 miles long and up to forty miles wide, and is the most developed, the oldest and largest agricultural community in the Province, with settlements close together, territories well served by electric and steam railway-lines, as well as navigable waterways.

The climate of the western half is characteristically coastal, but the eastern half has some features which are of a continental character. The growing season is long, but not so long as that of Victoria, and is moderately cool, the hottest six weeks averaging about 4 degrees higher than Victoria, and about 6 degrees lower than in the Dry Belt. Both the fall and spring are long, the winter is short, usually mild, and snow may lie to varying depths for several weeks, especially in the eastern half. A few degrees below zero is known, but is unusual. The winter precipitation, which is mostly rain, is heavy. Considerable fog and haze characterize the fall months, and the fall rains set in about September 15th. The district is pre-eminently suited to dairying, and has many features which make it unsurpassed in Canada for various types of small fruits.

The soils, while variable, may be characterized as upland and lowland or delta. The latter are usually deep, though not suited, as a rule, to fruit-growing, except for small fruits for the cannery. The uplands are variable, of glacial origin, have some of the hard-pan which is so prevalent in the south-eastern section of Vancouver Island, but also have many deep rich soils of the greatest value for small-fruit production. In some sections the uplands are quite heavy, and admirably adapted for pears. As in all other parts of the Province, there is a considerable portion of the land which is gravelly or light in character, less favourable for production than the better soils. The uplands, though usually deficient in lime, are well supplied with potash and have fair amounts of phosphoric acid. On all lands the addition of potash is very valuable in securing greater firmness of fruit.

The market for the product of this area is being found very largely in the Coast cities and in the cannery-factories, while the shipment of small fruits, cherries, plums, and prunes, by express to Prairie points, which has been large in volume for a number of years, promises to continue so. On the Coast these fruits meet with competition from the American side, but the tariff duties and higher freight rates give valuable protection, though the lack of organization among the shippers gives rise to a lot of irresponsible consignments. This makes the crop unwieldy and less satisfactory to both shipper and receiver. The straight car-load shipments furnished by competition.

Fruit-growing began in this territory with the planting of trees by the Hudson's Bay Company at Fort Langley. The first settlers in Chilliwack and Langley were mostly from Ontario, and planted many orchards between 1880 and 1895, principally to a mixture of Ontario varieties of apples, plums, and pears, which have furnished a great deal of information to guide the later planting in the district. Along the main line of the C.P.R., plums and prunes, as well as small fruits, were largely taken up between 1890 and 1905, though plum and prune planting received a great set-back some twelve years ago through the introduction of the brown-rot fungus, which under the favourable conditions of a moist climate has greatly restricted the shipping capabilities of all stone-fruits. The efforts to find good commercial varieties of plums which are immune from plum-rot have not been a success, and the development of the canneries in recent years, which promises to furnish a safe and reasonably remunerative market for these fruits, is most welcome.

The general experience in planting apples has not been favourable. Some shippers made good money for years out of early varieties of apples, and a few of the later kinds have given fair success, but most varieties do not succeed. Pears grow well, produce abundantly, but plantings so far have not been large enough to enable shippers to undertake car-load shipments to Prairie points, local production not yet meeting the entire demand of the Coast cities. Strawberries for local markets and express shipments to the Prairie do well, while raspberries are equally profitable. Sour cherries have been but little tried, but sweet cherries do well, more especially for local shipments. Grapes and peaches succeed only under the most favourable conditions, as is true in all Coast regions.

The Lower Mainland is not pre-eminently a fruit-growing section. Greater profits are to be made in the cultivation of vegetables, in dairying, poultry-raising, and in intensive mixed farming. In all of these lines a large market lies at the



producer's door. In fruit-growing the principal future development will be along the line of various small fruits, pears, and some early apples.

The age of the district and the great amount of experimenting that has been done make possible the recommendation of a well-trying list of varieties.

Strawberries—

Excelsior—Very early.

Warfield—Second early.

\*Dunlop—The favourite berry for this section.

Marshall—Does well; earlier than Dunlap.

Magoon—Good for local shipments and the cannery.

Raspberries—

Mariborough.

\*Cuthbert—Grown almost exclusively.

Gooseberries—

\*Oregon Champion—Grown almost exclusively.

Downing.

Industry.

Blackberries—

\*Snyder.

\*Taylor.

\*Evergreen.

Red Currants—

Cherry.

Victoria.

Black Currant—Naples.

Sour Cherries—

English Morello.

Olivet.

Sweet Cherries—

Reine Hortense—Early.

\*Royal Anne—A favourite for canning.

\*Bing—The favourite black cherry.

Lambert—Very late.

Peaches—

Early Charlotte

Alexander

Hale's Early

Early Crawford

} Must have very warm and sunny location, and do best against a south wall.

Grapes—

Moore's Early

Campbell's Early

Concord

} Must have warmth and air.

Plums and Prunes—

\*Monarch—Shipping.

\*Italian Prune—For canning and shipping.

Reine Claude—Home use.

Shropshire Damson—Home use.

Crab-apples—

\*Hyslop—The best for this section.

Pears—

\*Bartlett—The standard fall pear.

\*Bosc—Later than Bartlett; a good variety.

\*Boussock—Large and scab-proof.

\*Clairgeau—November.

\*Anjou—Late November; a very fine pear.

Louise Bonne—Heavy-bearing; small.

Comice—Very high-quality; Christmas pear.

Seckel—High quality; long-keeping.

Apples—

- \*Yellow Transparent } Home use; express shipments.
- \*Duchess } Home use; express shipments.
- Wealthy.
- Alexander.
- Gravenstein—Highest quality.
- \*King } Suitable December apples.
- Blenheim Orange } Suitable December apples.
- Grimes Golden—Worthy of trial for January and later.

(G.) LYTTON, LILLOET, SPENCE'S BRIDGE.

This district includes the lower levels, at from 800 to 1,200 feet elevation, in the valleys of the Fraser and Thompson Rivers, as indicated on the map. This lies just east of the Cascade Mountains, and is one of the very driest parts of the Dry Belt, the total precipitation averaging around 8 inches, which falls pretty uniformly throughout the year at the rate of about  $\frac{2}{3}$  inches a month. The snowfall is light, and of not much use as a protection to trees or for sleighing. The district is divided from those on the north and on the east by being somewhat milder in climate. The growing season is long and sunny, and the summer is the hottest to be found in the Province.

The total area of possible agricultural land in the district is not large, and irrigation is absolutely required for all of it.

The soils, as throughout the entire Dry Belt, are usually alluvial in character, having been deposited on the floor of the great fresh-water lake which at some ancient period covered the entire Interior country to a depth of about 3,000 feet above sea-level, present elevation. The most characteristic feature of the agricultural lands of the Dry Belt is the bench or terrace formation, these benches lying from a few feet to several hundred feet above the present river or lake levels. The soils, as is common throughout all arid regions, are fertile, and on the whole well supplied with lime, potash, and phosphoric acid, and though they have but little humus or vegetable matter, yet their nitrogen is in a very available form.

The greater part of the district is within reach of the C.P.R. and C.N.P.R. main lines, so that, while the local market is small, there is an excellent outlet, both to the Coast and to the East, for all that is produced in the district. Freight rates on the whole are favourable, and the high quality of the product ensures a favourable market. At the present time railway-construction is consuming most of the vegetables and much of the fruit grown in the district, but normally long-distance shipments are made.

The district has two of the largest old orchards of the Interior—that of Mrs. Smith at Spence's Bridge, and that of Thos. G. Earl at Lytton. These orchards, with a number of smaller ones, have been producing very high-class fruit of many kinds for a number of years. The total acreage of trees in bearing is not very great, and there has not been enough agricultural land available to permit of much further planting, yet the district has one of the most favourable climates, if varieties are correctly chosen.

Strawberries—

Magoon.

Raspberries—

Herbert.

Cuthbert.

Red Currants—

Fay.

Victoria.

Gooseberries—

Oregon Champion.

Downing.

Industry.

- Sour Cherries—  
 Montmorency.
- Sweet Cherries—  
 Royal Anne }  
 Bing } Inclined to winter injury.  
 Lambert }
- Grapes—  
 Concord }  
 Delaware } Are well proven here.  
 Niagara }  
 Worden }
- Plums and Prunes—  
 Peach Plum.  
 Bradshaw.  
 Pond's Seedling.  
 Italian Prune.  
 Reine Claude.
- Crab-apples—  
 \*Transcendent.  
 Hyslop.
- Pears—  
 Bartlett.  
 Flemish Beauty.  
 Anjou.  
 Winter Nells.
- Apples—  
 Yellow Transparent.  
 Duchess.  
 Wealthy.  
 \*McIntosh.  
 \*Jonathan.  
 \*Grimes Golden—Very good.  
 Northern Spy.  
 \*Winesap—The best variety for planting here.  
 \*Yellow Newtown.

(7.) KAMLOOPS-WALHACHIN DISTRICT.

The lands included in this district lie along the valley of the main Thompson River; the North Thompson for some distance north of Kamloops; and the East Thompson to a point beyond Ducks, on the main line of the C.P.R. to the east; at an elevation of 1,000 to 1,500 feet. The land in the district suitable for fruit-growing, under irrigation or irrigable, is only a small percentage of the entire area, and lies principally along the valleys of the rivers and the lower valleys of their tributary streams, where irrigation systems, either by gravity or pumping, can be installed.

The climate is typical of the Dry Belt, with a total precipitation of from 9 to 11 inches annually, evenly distributed throughout the year, the snowfall being, therefore, light and not of much significance. The air is dry and sunshine is plentiful and bright. In the winter there may be cold snaps, accompanied by wind, which prevent the cultivation of any but hardy varieties of fruit. The summer season is long and warm, bringing all varieties of fruit to a high colour and quality.

The soils are those of the Dry Belt described under the previous district, being usually deep, rich, and of good texture. Gravelly areas exist, and are not suitable for fruit-culture here as in any other section. There is, however, a large percentage of very good soil.

This district, having main line facilities, both on the C.P.R. and C.N.R., is well adapted to serve both the Coast and the Prairies, and has so far found a

ready market for all it has produced. In this district is grown the Ashcroft potato, which has a reputation all over Western Canada.

Fruit-growing in this district is looked on with favour, because of the generally high character of the soil, and the advantages of the summer climate for producing high colour and quality. Present production is not at all large, coming as it does from only a few old orchards planted around the establishments of the big cattle-ranches of a decade ago. These large ranches are being split up, where irrigation-water for their cultivable areas is to be had, into 10-, 15-, and 20-acre tracts for apple-culture. Plantings have been mostly along the lines of the varieties starred in the variety list recommended below, and these varieties are as a rule doing well. We do not recommend Splzenberg or Yellow Newtown for this district, as occasional winters may be too severe for them.

This district will, in a few years, be one of the largest shippers of fruits and vegetables in the Province as the projects now under way become settled and planted.

Strawberries—

Magoon.

Raspberries—

Herbert.

Cuthbert.

Gooseberries—

Oregon Champion.

Downing.

Industry.

Red Currants—

Fay.

Victoria.

Sour Cherries—

Montmorency.

Sweet Cherries—

Reine Hortense.

Bing.

Plums and Prunes—

Peach Plum.

Bradshaw.

Pond's Seedling.

Italian.

Damson.

Reine Claude.

Crab-apples—

Transcendent.

Pears—

Bartlett.

Flemish Beauty.

Anjou.

Apples—

Yellow Transparent.

Duchess.

\*Wealthy

\*McIntosh

Jonathas.

Grimes Golden.

Scott's Winter—Worthy of trial.

\*Whesap—In part of the district is very good.

(S.) SOUTHERN CENTRAL PLATEAU.

In southern British Columbia there is a great deal of farming and ranching carried on at elevations of from 2,000 to 3,500 feet in a Dry Belt country having

from 10 to 18 inches annual precipitation. This includes the Nicola Valley, Grande Prairie, and similar valleys at similar elevations. The boundaries on the map show this area to lie entirely between the Okanagan Valley and the Cascades, south of the Thompson River. There are, however, Dry Belt areas at similar elevations farther east, and to some extent north of the Thompson River, where similar recommendations of fruit may apply.

In general character, the climate, which is dry, is sunny and cool. The records, which have been kept at only a very few points, show that summer frosts are not unknown, while winter freezes may occasionally be severe. Records at Nicola Lake, at an elevation of 2,120 feet, for twelve years, give a growing season extending from April 13th to October 20th, a total of 190 days. The mean temperature of the six hottest weeks is 61.1 degrees, and the mean annual temperature 42.1 degrees. Under such conditions, only short-season fruits are likely to do well, and due care should be taken to choose those which have a reasonable prospect of standing the winters. There is practically no commercial fruit-growing in this district, and it is not likely to prove remunerative in the strong competition furnished by the valleys at lower levels, with longer growing seasons and milder winters.

The soils are variable, but a great many of them are good. A great many of them, such as the volcanic ash, are entirely suitable for fruit-culture—of course, under irrigation. There is a home market in the territory at present much greater than local production, and this will continue to be the case for many years. At the same time, it is recognized that the fruit-growing in this district will be mainly in the line of building up a home orchard. There are but few orchards planted up to the present time, but as more is being learned about the climate, and as more care is taken to choose hardy varieties, it is certain that fruit-culture to some extent will be carried on quite successfully.

Many kinds of small fruits will, of course, do well, and will have good quality, and it may be that, with the transportation facilities to be given this territory by the new railways now building through parts of it, this industry may grow and develop.

The list of fruits recommended is as follows:—

Strawberries—

Magoon.

Raspberries—

Herbert.

Cuthbert.

Gooseberries—

Oregon Champion.

Red Currants—

Fay.

Victoria.

Black Currants—

Naples.

Sour Cherries—

Montmorency.

Dyehouse.

Sweet Cherries—

Vilne Sweet.

Plums and Prunes—

Wild Goose.

De Soto.

Lombard.

(Try varieties of Americana and Nigra types.)

Crab-apples—

Transcendent.

Martha.

Hyslop.

Pears—

Flemish Beauty.

Apples—

\*Yellow Transparent

Red Astrachan

\*Duchess

\*Wealthy

\*Alexander

Wolf River

\*McIntosh

Faneuse.

Scott's Winter.

McMahon White.

} The stirred varieties give a succession from August to December for market.

(9.) SHUSWAP LAKE.

This comprises some areas which are not usually grouped, but the climatic conditions are such that development throughout the section is going on along about the same lines, and recommendations may be made for it accordingly.

The principal agricultural areas are those of Salmon Arm, Armstrong, Enderby, and Notch Hill. The land lies from 1,200 to 1,600 or 1,700 feet above sea-level, and from 15 to 500 or 600 above Shuswap Lake. Salmon Arm and Armstrong are old-settled communities, with a large production of fruits and vegetables.

This section is the most westerly of the Interior humid areas. The annual precipitation at Salmon Arm and Armstrong averages around 20 inches, which falls almost equally throughout the area, the greater part, however, in the six winter months, largely as snow. The winters are not cold, though there is some injury to the tenderer kinds of fruit. The summers are of good length, and warm, giving a very fine growing season for such varieties as Northern Spy, Grimes Golden, and McIntosh apples. The records show a growing season of 200 days at Salmon Arm, extending from April 6th to October 23rd, with a mean temperature in the six hottest weeks of 65.5 degrees, which is warm enough to permit of the development of corn and tomatoes.

While the total precipitation is not as great as might be desired for an exclusively non-irrigated district, no irrigation is being practised, and it must be said that as yet there are no crop failures recorded for this district because of drought.

The soils are much like those of the Dry Belt, save that under more humid conditions there has been some leaching of plant-food, while the growth of coniferous timber, which must be cleared, leaves the soil in a less favourable condition for cultivated plants for a year or two. Most of the upland soils are deep and retentive in character, and admirably adapted to a climate where as much moisture as possible must be conserved by cultivation throughout the growing season.

All parts of the district are within easy reach of the C.P.R. main line, and fruit-growers find a market both east and west for all that the district will not consume locally. Salmon Arm ships an average of from thirty to fifty car-loads of apples and larger quantities of produce annually, and Armstrong, though not a large shipper of apples, is the largest initial shipping-point in the entire Upper Country for potatoes, celery, cabbage, and other vegetables.

At Shuswap, Notch Hill, Salmon Arm, Seymour Arm, Mara, Enderby, Armstrong, and other points, there have been large plantings in recent years, principally to winter apples, and these are just beginning to come into bearing. Small fruits have proven satisfactory, especially at Salmon Arm, with its main-line facilities and progressive fruit-growers' organization. Spraying for apple-scab is necessary.

Because its climate in many respects resembles that of Ontario, the district is a popular one for certain classes of settlers, and is developing rapidly. The varieties planted, as a whole, are now being well chosen, though many miscellaneous and odd varieties planted in previous years have a depressing effect on prices received.

The list of fruits recommended for planting is as follows:—

Strawberry—

\*Magoon.

Raspberry—

\*Cuthbert.

Gooseberries—

Oregon Champion.

Downing.

Industry.

Red Currants—

Cherry.

Fay.

Sour Cherries—

Early Richmond.

Olivet.

Morello.

Sweet Cherries—

Royal Anne.

Bing.

Black Tartarian.

Plums and Prunes—

Bradshaw.

Yellow Egg.

Pond's Seedling.

Italian.

Reine Claude.

Crab-apples—

\*Truendental.

Hyslop.

Pears—

\*Bartlett.

Clapp's Favorite.

\*Flemish Beauty—Somewhat liable to scab here.

Anjou.

Apples—

Transparent.

Duchess.

\*Wealthy.

Gravenstein.

\*McIntosh—Apple-scab is a drawback.

Cox's Orange.

\*Jonathan.

\*Grimes Golden.

\*Wagener.

\*Northern Spy—Very highly considered.

#### (10.) UPPER OKANAGAN LAKE.

In this section are included Vernon, Kelowna, and the territory tributary to each. This has been for years the largest fruit-shipping district of the Province, and is likely to continue to hold that position for some years to come. The fruit-growing areas constitute quite a large proportion of the land included in the boundaries as marked on the map, and transportation facilities at present are by Okanagan Lake and the Shuswap and Okanagan branch of the C.P.R., which joins the main line at Skamoose. Fruit-growing is conducted at a considerable range of elevation above Okanagan Lake, which is at 1,200 feet, but practically all the commercial orchards are between 1,200 and 1,600 or 1,700 feet above sea-level.

In this district there is probably more land than in any other district of similar size in the entire Interior suitable for commercial fruit-growing. No figures are, however, available for either the amount of cultivated land or the amount of cultivable land here.

The climate may be taken as dry, usually warm in summer, and mild in winter. The total precipitation, as shown by carefully kept records at Vernon and Kelowna, is between 12 and 15 inches annually, of which slightly the greater half falls between October and March, inclusive. The snowfall is fairly reliable, though not deep, and furnishes sleighing for some months at levels of 1,500 feet or more, but is not constant or of much value on the lower levels. While the winter is usually bright and sunny, there are cold snaps, accompanied by wind, which affect peaches and the tenderer fruit-trees. Overirrigation and severe pruning have caused what are normally perfectly hardy varieties of apples to suffer as well, but in general there have been few mistakes made, and the fruit industry is in a very healthy condition.

In the growing season, which averages in length from April 5th to October 22nd, a total of 200 days, the average precipitation is about 7 inches, so that irrigation is necessary as soon as the orchard is planted. The mean temperature of the six hottest weeks is 63.3 degrees, indicating warm days, but reasonably cool nights.

What is said about soils in other Dry Belt districts is true here. There is a very large percentage of good fruit-growing soil in this section, and not many orchards have been planted in entirely unsuitable locations. It is advisable here, as everywhere else, for the intending fruit-grower to learn by personal observation what is the character of his soil and subsoil.

The district is well organized to supply its markets and to meet its competition, and for a number of years the growers have secured the full market returns for their produce. The greater part of the output is marketed in Alberta and Saskatchewan, but, with increased production, more and more is going to the Coast, which has been heretofore neglected in favour of the slightly higher-priced market to the East.

At the present time, Jonathan, McIntosh, Wealthy, Transcendent crab-apples, Wagener, and Italian prunes have been the principal fruits shipped, in quantity about in the order named.

The orchard survey conducted by the Department of Agriculture in the summer of 1911 showed the following plantings in the Vernon District:—

"In the area surveyed (3,188½ acres) the fruit-trees planted totalled as follows:—

" Apples .....	223,615 .
Prunes .....	16,042
Pears .....	7,477
Peaches .....	2,120
Cherries .....	3,555
Plums .....	7,282
Apricots .....	80

The percentage of varieties of apples planted are as follows:—

" Summer and early fall .....	3.2 per cent.
Wealthy .....	9.1 ..
McIntosh Red .....	9.3 ..
Crab .....	9.0 ..
King .....	0.3 ..
Jonathan .....	21.2 ..
Wagener .....	14.5 ..
Grimes Golden .....	3.0 ..
Northern Spy .....	2.5 ..
Spitzenberg .....	2.2 ..
Newtown Pippin .....	1.7 ..
Other fall varieties .....	1.4 ..
Other winter varieties .....	11.5 ..

(This latter includes Snow, Greening, Sutton Beauty, Baldwin, Delicious, Canada Baldwin, etc.)



" Also—

" Jeffries .....	1.4 per cent.
Whiesap .....	0.3 ..
Cox's Orange .....	6.0 ..
Rome Beauty .....	2.3 ..
Red-checked Pippin .....	0.5 ..
Salome .....	0.6 ..

" The varieties of pears include Clapp's Favourite, Bartlett, Flemish Beauty, Clairgean, and Winter Nelis, the most extensively planted being Bartlett and Flemish Beauty.

" Plums have produced well, the leading varieties being the Bradshaw, Washington, Peach, Pond's Seedling, Yellow Egg, Columbia, and Black Diamond.

" Italian prunes have also been extensively planted, with a lesser number of the sugar and German varieties, the average production being from three to five boxes per tree."

Cherries, small fruits, and grapes are planted to only a limited extent.

At Okanagan Centre, which is quite a young district, the total trees planted were 63,894, the following being the details:—

" Apples .....	43,303; estimated crop, 535 boxes.
Pears .....	9,898; .. ..
Plums .....	50; .. ..
Prunes .....	4,799; .. ..
Peaches .....	640; .. ..
Cherries .....	5,144; .. ..

*Varieties of Apples planted.*

" Summer and early fall .....	11.4 per cent.
Wealthy .....	11.8 ..
McIntosh .....	12.6 ..
Crab .....	0.7 ..
King .....	0.6 ..
Jonathan .....	18.0 ..
Wagener .....	15.6 ..
Northern Spy .....	0.4 ..
Spitzenberg .....	12.6 ..
* Newtown Pippin .....	1.8 ..
Other winter varieties .....	14.5 per cent."

This district has a rather milder winter than Vernon.

In the area covered by our surveyor in Kelowna District the following trees were planted:—

" Apples .....	131,345
Pears .....	11,591
Plums .....	1,254
Prunes .....	8,830
Peaches .....	1,250
Apricots .....	135
Cherries .....	5,711

" The following are the percentages of the varieties planted:—

" Summer and early fall .....	1.0 per cent.
Wealthy .....	7.9 ..
McIntosh Red .....	14.5 ..
Crab .....	5.9 ..
Jonathan .....	27.6 ..
Wagener .....	7.2 ..
Grimes Golden .....	1.0 ..
Northern Spy .....	6.0 ..
Spitzenberg .....	6.1 ..

Newtown Pippin .....	7.0 per cent.
Other winter varieties .....	15.8 ..

(The latter include Ben Davis, Cox's Orange, Whesap, Delicious, and Gravenstein, etc.)."

Westbank, which is on the west side of Okanagan Lake from Kelowna, is a comparatively new section, in which fruit-trees have been planted as follows:—

" Apples .....	6,420
Pears .....	158
Plums .....	10
Prunes .....	133
Peaches .....	500
Apricots .....	187
Cherries .....	357

*"Varieties planted.*

" McIntosh Red .....	7.5 per cent.
Crabs .....	4.2 ..
Jonathan .....	28.3 ..
Wagener .....	20.7 ..
Grimes Golden .....	8.3 ..
Northern Spy .....	8.0 ..
Newtown Pippin .....	5.0 ..
Other winter varieties .....	5.4 ..
Cox's Orange .....	3.2 ..
Whesap .....	4.2 ..
Rome Beauty .....	5.2 per cent."

The information as to varieties planted in these districts, which is given above, is condensed from the Orchard Survey Report reproduced in the Twenty-second Annual Report of the British Columbia Fruit-growers' Association, which may be obtained from the Department on request.

It will be noted from the lists of varieties above that there has been a very general planting of miscellaneous varieties, even in these, the most advanced districts of the Province. The tendency towards a selection of the very best varieties is, however, preventing much further planting of miscellaneous kinds, and it is to be hoped that the recommendations below will have some influence in enabling growers to choose a limited list of commercial varieties.

Strawberries—

Magoon.

Raspberries—

Cuthbert.

Gooseberries—

Oregon Champion.

Downing.

Industry.

Red Currants—

Cherry.

Fay.

Black Currants—

Naples.

Sour Cherries—

Olivet.

Morello.

Sweet Cherries—

May Duke.

Royal Anne.

Tartarian.

Bing.

Plums and Prunes—  
 Peach Plum.  
 Bradshaw.  
 Yellow Egg.  
 Pond's Seedling.  
 Italian Prune.  
 Washington.  
 Shropshire Danison.

Grapes—  
 Moore's Early.  
 Concord.  
 Niagara.  
 Delaware.

Crab-apples—  
 Transcendent.

Pears—  
 \*Flemish Beauty }  
 \*Bartlett }  
 Howell }  
 \*Anjou }  
 \*Bosc }  
 \*Clairgean }

Pears have done remarkably well on the lower lands at Kelowna, and this seems to warrant further planting.

Apples—  
 Transparent.  
 Duchess.  
 Wealthy.  
 \*McIntosh.  
 \*Jonathan.  
 \*Wagener—Has been winter-injured to some extent.  
 \*Grimes Golden.  
 \*Rome Beauty.  
 Delicious—Worthy of extensive trial here.  
 Yellow Newtown—Worthy of further trial.  
 \*Northern Spy—In certain locations.

#### (11.) LOWER OKANAGAN LAKE.

In this area are included the communities of Peachland, Summerland, Pentleton, Naramata, and some smaller ones.

The climates at elevations of from 1,200 to 1,700 feet in the Lower Okanagan Lake District are rather milder, with longer growing seasons, than on the upper part of the lake, but there is every reason to believe that the benches of Kelowna, for instance, have practically as long and as favourable a growing season as have those of Summerland. There is no marked distinction, the general climatic conditions being more favourable in the south.

In proportion to the area ultimately available, this district has been more thoroughly developed in the past eight years than probably any other similar area in the Province. In Peachland, Summerland, and Pentleton, nearly all of the possible land-area is under cultivation, and 75 per cent. of it is devoted to fruit. There will be, however, further plantings in this favoured district, and in every community there is a great deal of changing of poor varieties to better ones to be accomplished.

The climate is rather more arid than farther up the lake, the annual precipitation at Summerland and Pentleton for a five years' record in each case showing about 10 inches precipitation, as against 12½ at Kelowna and 14½ at Vernon. The growing season lasts from April 3rd to about October 26th, and averages, therefore, around 206 days long. At the lake-level the season is ten days longer than on the benches 200 or 300 feet above it, and there are a few hundred more

heat units received, but the mean temperature of the six hottest weeks is about 2 degrees less, due to the cooling influence of the deep lake.

The precipitation is fairly evenly distributed during the four quarters of the year. Snowfall is, of course, light, though at an altitude of 300 to 400 feet above the lake it is of some use to supply moisture and to provide protection for tree-roots. All the land in this district under cultivation is of necessity under irrigation.

The soils are typically Dry Belt, and a big proportion of the area has deep volcanic ash and clay loam soils of considerable fertility. There are, however, considerable areas of open gravel on some of which fruit-growing is being attempted, with less success. In common with the upper half of the Okanagan Valley, the district finds its market on the Prairie and to some extent on the Coast, while this year, for the first time, a number of car-loads of apples are being sent to Great Britain direct.

In this district there was practically no fruit-growing being done up to about eight years ago, but four large irrigation systems made possible the planting of the present acreage. It is in this district that the great proportion of the British Columbia peach-crop is grown, and about one-third of the trees are peaches. As these are planted as fillers in the apple-orchards, the great majority must be removed in a few years at latest, and the district will then become to all intents and purposes a producer of winter apples. Only a small proportion of pears, plums, or other fruits has been planted.

The following figures, taken from the Orchard Survey of the Department of Agriculture, indicate the relative plantings of trees in the various sections:—

*"Peachland District.*

" Apples .....	14,239
Pears .....	726
Plums .....	340
Prunes .....	48
Peaches .....	7,215
Apricots .....	125
Cherries .....	963

"Of the trees planted, 66.3 per cent. are over five years old, 33.7 per cent. being under five years. Peachland has planted less trees in proportion during the last five years than any other point on the Okanagan; the above represents practically the entire available acreage.

"The varieties are as follows:—

" Summer and early fall .....	2.8 per cent.
Wealthy .....	5.5 ..
McIntosh Red .....	4.7 ..
Crabs .....	3.1 ..
King .....	0.7 ..
Jonathan .....	18.7 per cent.
Wagener .....	17.0 ..
Grimes Golden .....	1.4 ..
Northern Spy .....	3.5 ..
Splzenberg .....	5.2 ..
Newtown Pippin .....	2.3 ..
Other winter varieties .....	35.1 ..

(The latter are chiefly Bismarck, Snow, Ontario, Gravenstein, Baldwin, and Canada Red.)

"The varieties of peaches planted are Alexander, Triumph, Yellow St. John, Fitzgerald, Early and Late Crawfords, and Elberta.

"Pears are chiefly Bartlett and Flemish Beauty, and cherries Royal Anne, Bing, Governor Wood, Lambert, and English Morello.

" *Summerland.*

" An area of 1,497 acres, with 133 orchards, was inspected here. The following tables show numbers, etc.:—

" Apples .....	80,536
Pears .....	6,160
Plums .....	2,087
Prunes .....	999
Peaches .....	45,357
Apricots .....	4,648
Cherries .....	2,023

" Of the apples, 47.6 per cent. were found to be over five years old, and 52.4 per cent. five years and under.

" *Varieties of Apples planted.*

" Summer and early fall .....	0.8 per cent.
Wealthy .....	2.4 ..
McIntosh Red .....	4.4 ..
Crab .....	2.5 ..
King .....	1.9 ..
Jonathan .....	21.0 ..
Wagener .....	18.5 ..
Grimes Golden .....	2.4 ..
Northern Spy .....	7.5 ..
Spitzenberg .....	11.5 ..
Newtown Pippin .....	13.4 ..
Hubbardson's .....	1.3 ..
Whinesap .....	1.0 ..
Baldwin .....	0.8 ..
Winter Banana .....	0.8 ..
Other winter varieties .....	9.8 ..

(The latter include Rome Beauty, Delicious, Snow, etc.)

" Bartlett and Flemish Beauty pears are the leading favourites, with Beurre d'Anjou, Clapp's Favourite, Duchess, and Comice. The leading varieties of plums are Pond's Seedling, Coe's Golden, Yellow Egg, Burbank, and Italian Prune.

" *Penticton.*

" Details were obtained of 102 orchards in this district, with an area of 1,158 acres, the following being the number of trees planted, etc.:—

" Apples .....	43,274
Pears .....	3,806
Plums .....	1,418
Prunes .....	1,502
Apricots .....	1,879
Cherries .....	3,030

" Total trees planted, 97,877, 93.6 per cent. of which were five years old and under, and 6.4 per cent. over five years old.

" The varieties of apples planted were as follows:—

" McIntosh Red .....	5.5 per cent.
Jonathan .....	32.0 ..
Wagener .....	21.6 ..
Grimes Golden .....	2.6 ..
Spitzenberg .....	12.3 ..
Newtown Pippin .....	7.0 ..
Other winter varieties .....	19.0 ..

(The latter include Whinesap, Rome Beauty, and Delicious, about equal proportions.)

"The main plantings of peaches include Triumph, Yellow St. John, Fitzgerald, Early and Late Crawford, and Elberta.

"Naramata District.

"Sixty-five orchards, with an area of 557 acres, were accounted for here, with a total of 39,359 fruit-trees planted.

"The following tables show varieties planted, etc.:-

" Apples .....	20,569
Pears .....	1,972
Plums .....	689
Prunes .....	120
Peaches .....	11,456
Apricots .....	3,661
Cherries .....	894

"Percentage of Varieties.

" McIntosh Red .....	3.4 per cent.
Jonathan .....	30.2 ..
Wagener .....	19.6 ..
Spitzenberg .....	10.0 ..
Newtown Pippin .....	12.6 ..
Rome Beauty .....	7.8 ..
Whinesap .....	4.4 ..
Delleclous .....	2 ..
Winter Banana .....	4.6 ..
Other winter varieties .....	5.2 per cent."

The varieties recommended for Southern Okanagan Lake are as follows:--

Strawberries—

- Glen Mary.
- Dunlop.

Raspberry—

- Cuthbert.

Gooseberries—

- Oregon Chautauq.
- Downing.
- Industry.

Blackberries—

- Snyder } Liable to freezing.
- Agawam }

Red Currants—

- Cherry.
- Fay.

Black Currants—

- Naples.

Sour Cherries—

- Olivet.
- Morello.

Sweet Cherries—

- Royal Anne.
- Bing.
- Tartarlan.

Peaches—

- Triumph
  - Hale's Early
  - Yellow St. John
  - Elberta
- } A list for home use and canning.

Apricots—

- Moorpark.
- Blenhelm.

Apricots—

Tilton.  
Royal.

Grapes—

Moore's Early.  
Campbell's Early.  
Concord.  
Niagara.  
Delaware.

European varieties produce well, if protected.

Plums and Prunes—

Peach.  
Bradshaw.  
Yellow Egg.  
Pond's Seedling.  
Italian Prune.  
Reine Claude.  
Danson.

Crah-apples—

Transcendent.  
Hyslop.

Pears—

Flemish Beauty.  
Bartlett.  
Anjou.  
Clairgeau.  
Winter Nells.  
Howell.

Apples—

Yellow Transparent.  
Duchess.  
Wealthy.  
\*McIntosh.  
\*Jonathan.  
\*Grimes Golden.  
\*Wagener.  
\*Rome Beauty.

Delicious } May prove of highest class commercially on further  
Yellow Newtown } trial.

(12.) SIMILKAMEEN.

In this district are included the lower valley of the Similkameen (extending up to a few miles above the town of Keremeos, which is the principal fruit centre of this section) down to the point where the river crosses the boundary into the United States, and the valley of the Lower Okanagan River and Osoyoos Lake. Of this district, no meteorological records have been kept, but practical experience has shown it to have a longer and warmer season than any other part of British Columbia, and so it is adapted to certain varieties of fruit which require such a long season, such as the Winesap apple.

There are several thousand acres of land now under irrigation, and on some of this has already been planted fruit-trees. Much larger areas of very fine land will undoubtedly be put under irrigation in the near future, and this, when accomplished, will make the district an important one.

As to climate, no definite figures can be offered, but the winters are usually mild, with little snow, and sunny. The growing season is long, practically free from spring or fall frosts, and warm.

The district has previously suffered from lack of transportation facilities, having only the Great Northern Railway, which made it tributary to Spokaue. Direct

railway connections with Vancouver, now under construction, put the district in a very favourable position for the production of all kinds of early vegetables and many kinds of fruits for that market.

An idea of the present state of production and the plantings already made is given from the following quotations from our Orchard Survey:—

“Twenty-six orchards, with an area of 572½ acres, were visited here, fruit-trees being planted as follows:—

“ Apples .....	30,841
Pears .....	700
Plums .....	600
Prunes .....	76
Peaches .....	7,126
Apricots .....	166
Cherries .....	326

“Of the apple-trees planted, 76 per cent. were five years old and under, and 24 per cent. over five years old. The varieties are:—

“ McIntosh Red .....	13.7 per cent.
Jonathan .....	38.5 ..
Wagener .....	2.8 ..
Spitzenberg .....	13.7 ..
Newtown .....	7.0 ..
Baldwin .....	7.1 ..
Other winter varieties .....	17.1 ..

(The latter include Whinesap, Yellow Belleflower, and Delleclous.)”

The section on the Okanagan River and Osoyoos Lake is very well described in the following paragraphs from our report on Orchard Survey:—

“Fairview District.

“From here to the boundary, a distance of twelve miles is a very large area of bench land lying west of the Okanagan River and Osoyoos Lake, at an elevation of 900 to 1,400 feet. The land suitable for fruit-trees is estimated at a minimum of 20,000 acres, the soil throughout being a deep sandy loam with volcanic ash, and the climate one of the driest in British Columbia. The precipitation for the last twelve months (rain and snow) was 5 inches, with minimum temperatures on January 12th and 13th, 1911, of -12 degrees, and on February 2nd, -3 degrees.

“There are only two orchards in this great area, the Park Ranching Co. (25 acres) and Leslie Hill's (36 acres), the reason being the lack of irrigation-water.”

The list of fruits recommended for the district is as follows:—

Strawberries—

Magoon.

Glen Mary.

Dunlop.

Raspberry—

Cuthbert.

Gooseberrles—

Oregon Champion.

Downing.

Industry.

Blackberries—

Snyder.

Agawam.

Red Currants—

Cherry.

Fay.

Black Currants—

Naples.



Sour Cherries—

Olivet.  
Morello.

Sweet Cherries—

Royal Anne.  
Blug.  
Tartarian.

Peaches—

Hale's Early.  
Triumpi.  
Yellow St. John.  
Elberta.

Apricots—

Moorpark.  
Blenheim.  
Tilton.  
Royal.

Grapes—

Moore's Early.  
Campbell's Early.  
Concord.  
Niagara.  
Delaware.

European kinds, such as Black Hamburg and Flame Tokay, have been produced here for a number of years.

Plums and Prunes—

Peach.  
Bradshaw.  
Yellow Egg.  
Pond's Seedling.  
Italian Prune.  
Greengage.  
Shropshire Damson.

Pears—

Flemish Beauty.  
Bartlett.  
Anjou.  
Clairgean.  
Winter Nells.

Crab-apples—

Transcendent.  
Hyslop.

Apples—

Transparent.  
Duchess.  
Wealthy.  
McIntosh.  
\*Jonatban.  
Grimes Golden.  
\*Wagener.  
\*Delicious.  
\*Yellow Newtown.  
\*Winesap—Especially valuable.

(13.) KETTLE RIVER VALLEY.

Of the large area marked out on the map as included in this section, there is, properly speaking, only a small percentage of land suitable for fruit-growing.

and it lies at an elevation of from 1,700 to 2,000 feet, between Rock Creek on the west and Cascade on the east, the International Boundary on the south, and extending into the small valleys north of the railways a short distance.

In general climate the district is not unlike that of the Northern Okanagan, both in summer and in winter, the particular conditions being much the same, save that in "the boundary" the snowfall is not so heavy. The winter temperatures are about the same as Vernon, and low temperatures make the tenderer varieties of fruit impracticable. Midway has the reputation of having a colder winter than Grand Forks, due to the configuration of the valley and its slightly greater altitude. At Rock Creek, which lies at about 2,000 feet, the snowfall is rather heavier, and it is probable that the total precipitation is considerably greater.

The soils of this district, which is in the Dry Belt, are not unlike those of the other Dry Belt districts above described. At Rock Creek there is a considerable proportion of light and open soils, especially on the bottom lands, while on the benches it is usually a black loam. At Midway the soil is a light to sandy loam and varies a good deal at different elevations, while in the Grand Forks District there is a great deal of rich black loam on the lower levels, with sandy clay subsoil, and some good moderate clay loams on the benches, which lie at heights of from 40 to 100 feet above the river.

The orchards of this district find a market nearly altogether in the mining towns of the Boundary, the Kootenay, and the Crowsnest, but increased quantities are reaching the Prairie, while Grand Forks apples sent to Australia have given good satisfaction. The district is well situated with regard to freight rates locally and to the Prairies, but the long haul to the Coast results in a higher rate that way, and the transfers in moving the fruit out in any direction at present result in some delay. The completion of the Kettle Valley line to the Coast will be of the greatest assistance to this district in providing for it an additional outlet.

Fruit-growing commenced to develop at Grand Forks quite a number of years ago, this district being the site of the Hon. Martin Burrell's ranch and the Covert Estate. The survey reports given below indicate the development of the fruit industry in the principal areas included in this valley:—

*"Rock Creek District.*

"Eighteen orchards, with an area of 406½ acres, were inspected here. Of these, five were not irrigated and two only partially irrigated.

"The following tables show numbers planted, etc.:—

" Apples .....	16,088
Pears .....	280
Plums .....	36
Prunes .....	288
Apricots .....	250
Cherries .....	20

*"Varieties of Apples.*

" Wealthy .....	25.8 per cent.
McIntosh Red .....	24.6 ..
Crab .....	5.4 ..
Jonathau .....	25.4 ..
Other winter varieties .....	18.8 ..
(The latter include Delicious, Winter Banana, and Wisner's Dessert.)	

*"Midway District.*

"Nine orchards, with an area of 174½ acres, were visited here, with trees planted as follows:—

" Apples .....	8,394
Pears .....	55

Plums .....	65
Prunes .....	138
Cherries .....	30

" *Varieties.*

" Summer and early fall .....	4.2 per cent.
Wealthy .....	40.4 ..
McIntosh Red .....	15.5 ..
Jonathan .....	10.8 ..
Wagener .....	12.5 ..
Other winter varieties .....	16.6 ..

(The latter include Ben Davis, Winter Banana, and Wolf River.)

" Of the apples planted, 32.2 per cent. are over five years old, and 67.8 per cent. five years old and under.

" *Grand Forks District.*

" Forty-one orchards, with an area of 1,696½ acres, were visited here.

" *Trees planted.*

" Apples .....	82,213
Pears .....	6,645
Plums .....	1,971
Prunes .....	7,488
Peaches .....	177
Apricots .....	300
Cherries .....	1,426

" *Apple Varieties.*

" Summer and early fall .....	1.5 per cent.
Wealthy .....	3.8 ..
McIntosh Red .....	2.6 ..
Jonathan .....	21.4 ..
Wagener .....	20.4 ..
Northern Spy .....	11.1 ..
Spitzenberg .....	4.9 ..
Newtown .....	5.6 ..
Rome Beauty .....	2.9 ..
Delicious .....	4.5 ..
Winesap .....	3.2 ..
Red-cheek Pippin .....	2.2 ..
Other winter varieties .....	15.9 ..

" Of the above apples, 12.9 per cent. are from five to fourteen years old, and 87.1 per cent. five years old and under."

The list of varieties recommended for this district is as follows:—

Strawberries—

- Magoon.
- Clark's Seedling.
- Dunlop.
- Royal Sovereign.

Raspberries—

- Cuthbert.
- Herbert.

Gooseberries—

- Oregon Champion.
- Downing.
- Industry.

Red Currants—  
     Cherry.  
     Fay.  
 Sour Cherries—  
     Montmorency.  
     Morello.  
 Sweet Cherries—  
     Royal Anne.  
     Bing.  
 Grapes—  
     Moore's Early.  
     Campbell's Early.  
     Concord.  
 Plums and Prunes—  
     Peach.  
     Bradshaw.  
     Pond's Seedling.  
     Shropshire Damson.  
     Reine Claude.  
 Crab-apples—  
     Transcendent.  
     Hyslop.  
 Pears—  
     Bartlett.  
     Flemish Beauty.  
     Clairgeau.  
     Anjou.  
 Apples—  
     Yellow Transparent.  
     Duchess.  
     Wealthy.  
     \*McIntosh.  
     Alexander.  
     \*Jonathan.  
     Grimes Golden.  
     \*Rome Beauty.  
     \*Red-checked Pippin.  
     \*Ontario.  
     Northern Spy.

(14.) WEST KOOTENAY.

For this district, we have grouped the large area tributary to the Arrow Lakes, the Lower Columbia River, Slovan Lake, Lower Kootenay River, Kootenay Lake, and the West Arm of Kootenay Lake. In the large area included there is only a very small proportion of land which is, or can be, cultivated and rendered suitable for fruit-growing, the principal areas being indicated by the survey reports given below.

The whole of the district is characterized by a total precipitation of from 28 to 42 inches annually, being lowest in the southern and south-westerly section, and increasing to its maximum at Revelstoke and the upper end of Kootenay Lake. The winter snowfall is usually heavy, and remains on the ground for a long period. Of the total precipitation, nearly two-thirds falls in the months of October to March, inclusive, partly as snowfall; but in the month of June the precipitation amounts to 2½ inches on the average, the humid condition then resulting giving rise to a certain amount of apple-scab, which has to be combated by spraying.

The growing season is longest at Nelson, Creston, and the more southerly points. In Nelson, for which good records are available, it extends on the average from April 3rd to October 22nd, a total of 202 days, while the mean temperature of the six hottest weeks is 65.0 degrees. At Revelstoke, with an altitude of 1,476 feet, is

against 1,700 feet at Nelson, the growing season is from April 10th to October 15th, a total of 182 days, with a mean temperature for the six hottest weeks of 63.3 degrees. Creston probably has a warmer and longer season than Nelson. As a general rule, it might be stated that the season is shorter and cooler, between the limits mentioned for Nelson and Revelstoke, as one goes north.

The climate in general is very like that of some parts of Ontario, save that West Kootenay is remarkable for its absence of winter injury in any form.

The soils are extremely variable, but in a great proportion they are light and deficient in most of the elements of plant-food. On the other hand, there is some very fine soil, and here, as elsewhere, much depends on the land selected.

While the district has been known for a number of years as a great mining country, its development in fruit-growing is of comparatively recent origin, and at the present time is just beginning to overtake local consumption of the mining and lumbering communities in most lines of fruit. In a few years, however, shipments to the outside must become larger and larger, especially in many varieties of apples which are produced here to a very high degree of perfection, and which will always command the favour of the market. The district is favoured in its location and its freight rates to the Prairie, while a new line being constructed to Vancouver will, it is expected, result in material improvement in service and in rates to the Coast. The scattered character of the settlements, and the use of water rather than rail transportation, result in a relatively higher cost of living and of production, which may be said to be offset by the very satisfactory quality of the fruit.

The varieties of fruit planted will be definitely dealt with in the 1912 Orchard Survey Report, now being compiled in the offices of the Department. It might be said at this time that peaches have been but very little planted, practically not at all commercially. The same is true of apricots and grapes. Pears, crab-apples, plums, and prunes have been planted to a small extent, sweet cherries rather more so. Strawberries have been put in in considerable acreage, especially by the Donkhobor Society. The principal fruit-plantings are of winter apples, principally Wagener, Jonathan, Northern Spy, McIntosh, Ontario, Cox's Orange, Wealthy, King, Gravenstein, Rome Beauty, and Dellefous.

Generally speaking, conditions in this district are not favourable to the shipment of soft fruits, except for such points as have quick rail facilities east or west. Jam-making is now a well-established industry, and much more than the present production could be used for this purpose. The great future for this country in fruit-growing is undoubtedly in such varieties of winter apples as reach perfection.

The list of fruits recommended for planting are as follows:—

Strawberries—

Magoon

Dunlop

Royal Sovereign

Glen Mary

William Belt

} For shipping.

} For canning.

Raspberries—

Cuthbert.

Gooseberries—

Oregon Champion.

Downing.

Industry.

Red Currants—

Cherry.

Fay.

Black Currants—

Naples.

Sour Cherries—

Olivet.

Morello, English.

Early Richmond.

- Sour Cherries  
 Montmorency
- Sweet Cherries—  
 Royal Anne,  
 Bing,  
 Lambert,  
 Black Tartarian.
- Peaches—  
 Alexander }  
 Triumph } Peaches must have warm location.  
 Early Crawford }
- Grapes—  
 Moore's Early }  
 Campbell's Early } Must have favourable location.  
 Concord }
- Plums and Prunes  
 Peach,  
 Bradshaw,  
 Pond's Seedling  
 \*Hullon Prune,  
 Reine Claude,  
 Shropshire Damson
- Pears -  
 Bartlett,  
 Flemish Beauty - Seals somewhat; requires careful spraying.  
 Chalmers,  
 Anjou.
- Crabapples  
 Transcendent.
- Apples -  
 Yellow Transparent,  
 Duchess,  
 Wealthy,  
 Alexander— Fall cooking.  
 \*McIntosh Red - Must be sprayed for apple-seab.  
 \*Gravenstein - Of exceptional quality here.  
 Jonathan - Must have a warm sunny location and deep soil.  
 \*Northern Spy - In warmer sections; with deep and rich soils.  
 \*Wagener—The favourite apple; plant on benches.  
 \*Ontario - Does very well.  
 Baldwin—Yields heavily.  
 Cox's Orange - Of good quality and keeps well.

#### (15.) EAST KOOTENAY.

This territory includes the valleys of the Upper Columbia and the Upper Kootenay, embracing a large area of agricultural land estimated at approximately 1,000,000 acres, most of which is available for mixed farming, by dry-farming methods without irrigation. The territory stretches from the International Boundary north-west through the Cranbrook and Windermere country, up to and including the Golden section.

The climate of the district is semi-humid in character, the total annual precipitation averaging about 18 to 19 inches, of which a considerable proportion falls in the second quarter of the year, at least in the southern half of the district. The records for Golden, Cranbrook, and Wilmer indicate a growing season of between 175 and 190 days, the most favourable records being from the Windermere country. The number of heat units runs from 9,250 at Golden to 10,000 at Cranbrook, 10,750 at Wilmer, and 10,750 at Tobacco Plains, in the Elko District. Similarly, the mean temperature of the six hottest weeks is 60.1 degrees at Golden, 62.2 degrees at

Cranbrook, 63.8 degrees at Wilmer, and 63.9 degrees at Tobacco Plains. The growing season is therefore short and cool, and this, by diminishing the amount of evaporation, helps to make more useful the amount of precipitation received. Dry-farming methods are producing very satisfactory crops of potatoes in the St. Mary's District, near Cranbrook, while alfalfa is being produced, mainly with supplementary irrigation, throughout the entire territory in small areas at the present time. Winter temperatures run sufficiently low to make the growing of most varieties of apples more or less unsatisfactory, and only the hardy varieties, which should do best in this district, are recommended by the Department.

The district is one which will eventually support a large population, based on mixed farming, with fruit-growing more or less as a side-line, as its possibilities become demonstrated. There is no reason why small-fruit culture should not obtain considerable success.

The soils are variable, but, the precipitation being light, they have not been leached of their valuable plant-food, and analyses made at the Central Experimental Farm, confirmed by practical farming experience in the district, show a very satisfactory supply of potash and lime, with variable amounts of phosphoric acid, and, as is usual in Dry Belt soil, a low content of nitrogen, in, however, a very available form. Much of the soil is a very fine, deep, rich loamy silt, and there are, of course, all extremes.

Most of the land carries a small growth of timber, which costs at present prices \$30 to \$50 per acre to clear. Irrigation is being applied on several large projects, especially in the more arid part of the Upper Columbia District, and settlement is proceeding most rapidly in these areas.

Up to a few years ago, the district was largely used as range land by a few large cattle-ranches, and thousands of cattle were exported yearly over the Crowsnest line and the C.P.R. main line. With the development of mining in the Crowsnest, and lumbering through the territory wherever railway facilities were sufficient, a local market has been gradually created for practically everything that is produced. The district has not been developed far enough to undertake to look after outside markets in any lines. There is no doubt that small fruits from the upper part of the district will be marketed in the Prairies in a few years, and should bring very good prices. Alfalfa is doing well, and the country has all the requirements for a successful dairying and mixed-farming industry. Practically no fruit-growing is being done outside of a very few small orchards here and there, principally of the earlier and harder varieties, the fruit of which keeps exceptionally well owing to the short and cool season, and is marketed at very remunerative prices locally.

The following list of fruits recommended by this Department has in view hardiness and adaptability to conditions:—

Strawberries—

Bederwood,

Dunlop,

Williams,

Raspberries—

Herbert,

Red Currants—

Victoria,

Red Dutch,

Black Currants—

Samders,

Victoria,

Gooseberries—

Oregon Champion,

Sour Cherries—

Early Richmond,

Montmorency.

Sweet Cherries—

Reine Hortense,  
Vilue Sweet.

Plums and Prunes—

Wolf,  
Hawkeye,  
Stoddard,  
De Soto,  
Cheney.

Also other American plums. Try also Shropshire Damson and Relue Claude.

Crab-apples—

Whitney,  
Martha,  
Transcendent.

Pears—

Flemish Beauty.

Apples—

Yellow Transparent,  
Charmloff,  
Tetofsky,  
Duchess,  
Wealthy,  
McMahon White,  
Longfield,  
Melutosh Red } Worthy of trial.  
Scott's Winter }  
Milwaukee,  
North-west Greening.

(C6.) CENTRAL BRITISH COLUMBIA.

Outside of the areas described under previous headings as the fruit districts of southern British Columbia, there remains the greater part of the possible agricultural area of the Province which falls east of the Cascade Mountains and north of the main line of the Canadian Pacific Railway. Through this country the main lines of the Canadian Northern and the Grand Trunk Pacific will run, and here it is that tremendous agricultural development will undoubtedly take place in the near future. All authorities who have visited this great and hitherto unknown country unite in regarding it a great future in mixed farming and general agriculture. On account of the character of the growing season, which is inclined to be somewhat short and cool, with occasional summer frosts, together with winter temperatures, that will prove too severe for most of the commercial varieties of fruit, the district is not expected to become one for commercial fruit-production. There will, of course, always be a ready local market for whatever fruit is produced, but the principal function fruit-growing will have will be that of providing something for the farmer's home.

This great area includes those valleys of the north which are now so much in the public eye, including the Upper Skeena, the Upper Fraser, the Bulkley, Stewart, the Nechaco, and all the territory described now as the Fort George country.

The reports in the hands of the Department of Agriculture would indicate that while the soils throughout this country are variable, as in the rest of the Province, yet there is a large proportion of good agricultural land which will be quite suitable for experimental work with fruit. Up to the present time there have not been brought to the attention of the Department any fruit-trees farther north than Soda Creek and Quesnel in the Fraser basin, except some which have been planted in the last two years. We believe that, with the choice of the hardier



varieties, home orchards could be made quite general through the entire area, the winter climate being but little more severe than that of Ottawa.

The Department of Agriculture has distributed a number of trees for experimental purposes in this district, and more will be known in a few years about its capabilities. In the meantime, the following list of varieties is submitted as containing those most worthy of trial:—

**Strawberries—**

Bederwood.

Daintop.

Williams.

**Raspberries—**

Herbert.

**Red Currants—**

Victoria.

Red Dutch.

**Black Currants—**

Sanders.

Victoria.

**Gooseberries—**

Oregon Champion.

**Sour Cherries—**

Early Richmond.

Montmorency.

Orel 25.

**Plums and Prunes—**

Wolf.

Hawkeye.

Stoddard.

De Soto.

Cheney.

Also other American plums. Try also Stropshire Danson and Reine Claude.

**Crab-apples—**

Whitney.

Martha.

Transcendent.

**Pears—**

Flemish Beauty.

**Apples—**

Yellow Transparent.

Charmatoff.

Tetofsky.

Duchess.

Wealthy.

McMahon White.

Longfield.

McIntosh Red.

Scott's Winter.

Millwaukee.

North-west Greening.

**GENERAL SUGGESTIONS TO ORCHARD-PLANTERS.**

All fruit-trees sold in this Province are inspected by the Inspector of Fruit Pests' Branch of the Department of Agriculture. They may be accepted as practically free from all insect pests, and are not likely to show any fungous or bacterial disease at a later date; as far as inspection can render them clean, they are so. In addition, all the nurserymen of this Province, and all the nurserymen outside the

Province who have agents in the Province, are licensed, and bonded in the sum of \$2,000 each, as indicated in the following excerpts from the "Agricultural Associations Act":—

"60. No person shall sell within the Province, as principal, agent, solicitor, or otherwise, fruit-trees, plants, or nursery stock without the licence therefor by this Act required.

"61. Any person may obtain from the Minister a licence to sell within the Province fruit-trees, plants, and nursery stock upon payment of the licence fee hereinafter provided, and upon filing with the said Minister a bond to His Majesty, satisfactory to said Minister, in a penal sum not exceeding two thousand dollars, conditional that the obligor shall pay all damages that may be occasioned to any person in the Province through the sale to such person by the licensee, his agent or agents, of any infected fruit-trees, plants, or nursery stock, or of any fruit-trees, plants, or nursery stock that are not of the variety and character represented by the licensee, his agent or agents, at the time of sale.

"62. Any person in the Province who shall sustain damage through the sale to him by the licensee, his agent, or agents, of any infected fruit-trees, plants, or nursery stock, or of any fruit-trees, plants, or nursery stock that are not of the variety and character represented by the licensee, his agent or agents, at the time of sale, shall have a right of action in the Courts of this Province upon said bond for such damages, notwithstanding the provisions of any contract of agreement to the contrary.

"63. A licence under section 61 hereof shall not be for a longer period than one year, and shall expire on the thirty-first day of December of the year in which it is issued.

"64. The fee for such a licence shall be five dollars for nurserymen and five dollars for each agent.

"65. Any licence granted under the foregoing sections may be suspended or cancelled by the Minister, upon evidence satisfactory to the Minister that the holder of the licence has sold infected fruit-trees, plants, or nursery stock, or fruit-trees, plants, or nursery stock that were not of the variety or character represented at the time of sale."

This Act has been passed for your protection. It is, however, necessary for you to read it carefully and understand it in order to obtain the benefits which it confers.

Some nursery stock is sold here by mail. Legally, no protection can be afforded the purchaser who sends his money out of the Province in a mail order, and on this account it is wiser to avoid those nurserymen who refuse to put up bonds and do business through agents.

A list of the principal firms growing nursery stock in British Columbia is as follows:—

*Vancouver Island.*—The Layritz Nurseries, Victoria; Vancouver Island Nurseries, Soanenos; G. A. Knight, Mt. Tolmie.

*Lower Mainland.*—Fraser Valley Nurseries, Aldergrove.

*Interior.*—Coldstream Nurseries, Vernon; Layritz Nurseries, Kelowna; Riverside Nurseries, Grand Forks.

Buy from reliable, established, and responsible firms. Buy only stock which has been grown by the nurserymen who sells it to you. There is a double risk in buying from the nursery-stock jobber, and there have been more unsatisfactory results from stock so purchased than from stock bought direct from the nursery which grows it.

You are recommended to purchase stock grown under similar conditions of soil and climate. Coast-grown stock, generally speaking, does better on the Coast, and Dry Belt stock better in the Dry Belt. There are plenty of exceptions to this general rule, but the principle stands.

In buying in British Columbia you get the trees quicker, and at lower costs for freight and other charges; you avoid inspection, and possible fumigation, at

Vancouver, to which all imported stock is subjected; and we are able to state that British Columbia stock is liable to be more free from pests than most of that grown in districts not so well protected from injurious insects.

It is well to place orders early in September rather than in December. For planting on Vancouver Island or in the West Kootenay, which it is desirable to do in the fall, orders may be placed still earlier, and the stock delivered late in October.

In buying from agents, remember that the accredited agent will have his licence to show. Keep a copy of the order given and insist on the delivery of the varieties you specify. It is better to make a personal inspection of the stock at the nursery, and one man might very well do this for himself and a number of neighbours at the same time. In such case stock should be inspected before it is dug and stored.

#### SELECTION OF NURSERY STOCK.

It is now generally agreed that the one-year-old tree has such great advantages as to be most desirable for nearly all conditions. For fall planting in the Lower Mainland a two-year-old tree may be better, and for most types of cherries, in any Coast section, the two-year or even the three-year-old tree may stand transplanting to better advantage than the one-year-old. As a general rule, however, the one-year-old top on either a two- or three-year-old root is satisfactory. For home orchard use, a two- or three-year-old tree may be brought into bearing earlier, and will make a dwarfier tree.

The type of the stock selected is of importance. For all parts of the Interior it is a great mistake to plant trees which grew 5, 6, or 7 feet high in the nursery. The best stock is  $3\frac{1}{2}$  to  $4\frac{1}{2}$  feet high, one year old. This can then be headed at 20 to 24 inches to very good advantage. There is a tendency on the part of inexperienced growers to purchase big trees. In fact, the nurserymen claim that they insist on having the big stock. The results are usually much less satisfactory than with smaller, well-matured stock, in many ways.

There is much discussion as to the relative merits of grafted or budded trees in the purchase of apples and pears. There is a great deal to be said on both sides, but the net results of the discussion are about evenly balanced.

Pests and diseases are rare on British Columbia grown stock, first because it is inspected regularly; second, because it is grown in districts naturally free from pests; and, third, because the whole of the stock is dug up each fall and sold out. With two- or three-year-old stock there is a chance for pests to accumulate.

The trees as delivered should be in good health, as shown by the healthy appearance of the bark. They should be well matured and with good strong buds. The root systems should be large, roots numerous, and with plenty of fibrous roots. The side shoots on the trunks of the trees should not have been removed, or at least enough of them should be left to form a head at the proper height.

#### CARE OF TREES ON ARRIVAL.

Nursery stock should be removed from the railway-station promptly on advice from the railway agent; it should be taken out to the place where it is to be planted, and if not to be planted immediately, then should be heeled in. If frozen in transit, the packages should be placed in a cool, shady spot, and allowed to thaw out very gradually. If the stock is dried out, it should be covered with moist soil pretty well up to the tops of the trees, instead of heeling in just to the depth the trees were in the nursery, as is usually to be done. If growth has started, the trees must be very carefully handled, and should be shaded after being unpacked, so as to save the new shoots if possible; if growth has started very materially, success is not very likely. In heeling-in in the fall, trees should be placed on a slant in a trench, about 10 inches deep, with the roots well covered with moist earth, which should be shaken down well among them. The tops of the trees should face towards the south to prevent sun-scald. In severe climates some

evergreen boughs may be thrown over the trees for protection. The place to heel in should be high and well drained and protected from mice.

#### PLANTING

For the greater part of the Province, planting should be done in the spring, as indicated above. Fall planting may be done up to about November 1st with safety in the Kootenay, and about the middle of November on Vancouver Island. The time for planting in the spring is determined very largely by the amount to be done, the preparation of the land, and the men available, but it is best done as early as possible after heavy frosts are over. The holes should be large and dug early. Good soil should be placed in the bottom. The roots should be pruned so as to give good healthy wood at the tips of all the main roots. The tops should be headed back to from 20 to 24 inches. The trees should be protected from drying out by having the roots wrapped in a wet burlap sack, or by being carried in a packing-case, the bottom of which is filled with wet moss or wet bags, with which the roots are also covered.

The trees should be set very firmly and should be immediately irrigated if the soil is dry, but the irrigation should not touch the trunk of the tree. In planting on the Coast the tree should be set a little deeper than it was set in the nursery, up to about 2 inches deeper in open or sandy soils. In the Dry Belt they may be set from 2½ to 4 inches deeper, depending on the soil-texture and character of the subsoil. In the humid regions of the Interior they should be set on an average 2 to 3 inches deeper than in the nursery.

Our nurserymen as a rule pack their trees carefully, and with due regard to the time they will be in transportation, so that usually stock arrives in good condition. A great deal more damage is done to young trees by carelessness in handling and planting, especially by drying out, than can be readily believed. The greatest possible care to prevent drying out, to keep the trees vigorous, and to prevent loss of vitality in any way is the best possible insurance for a vigorous start.

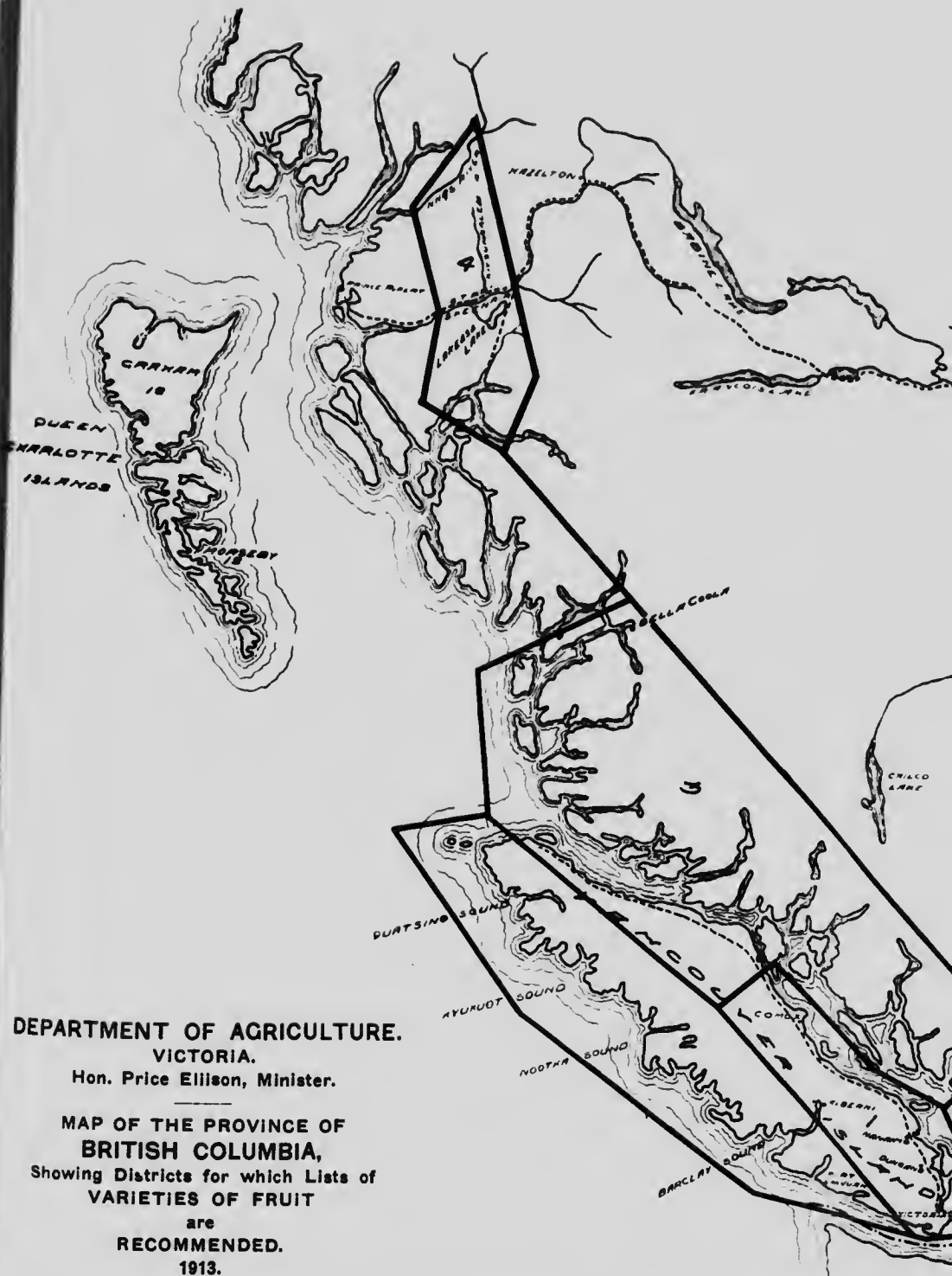
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1913.







DEPARTMENT OF AGRICULTURE.  
VICTORIA.

Hon. Price Ellison, Minister.

MAP OF THE PROVINCE OF  
BRITISH COLUMBIA,  
Showing Districts for which Lists of  
VARIETIES OF FRUIT  
are  
RECOMMENDED.  
1913.





