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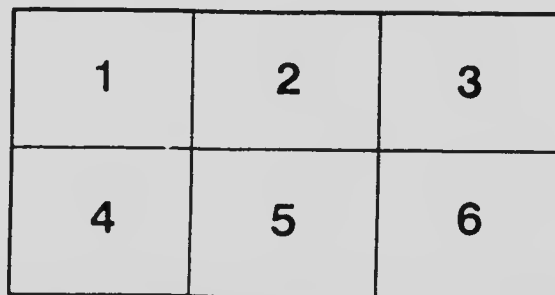
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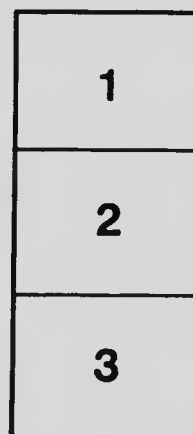
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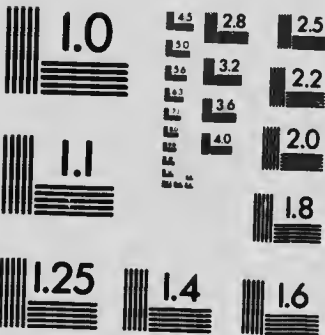
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DEPARTMENT OF AGRICULTURE

OTTAWA, CANADA.

TOBACCO DIVISION

# TOBACCO GROWING IN BRITISH COLUMBIA

(Preliminary notes)

BY

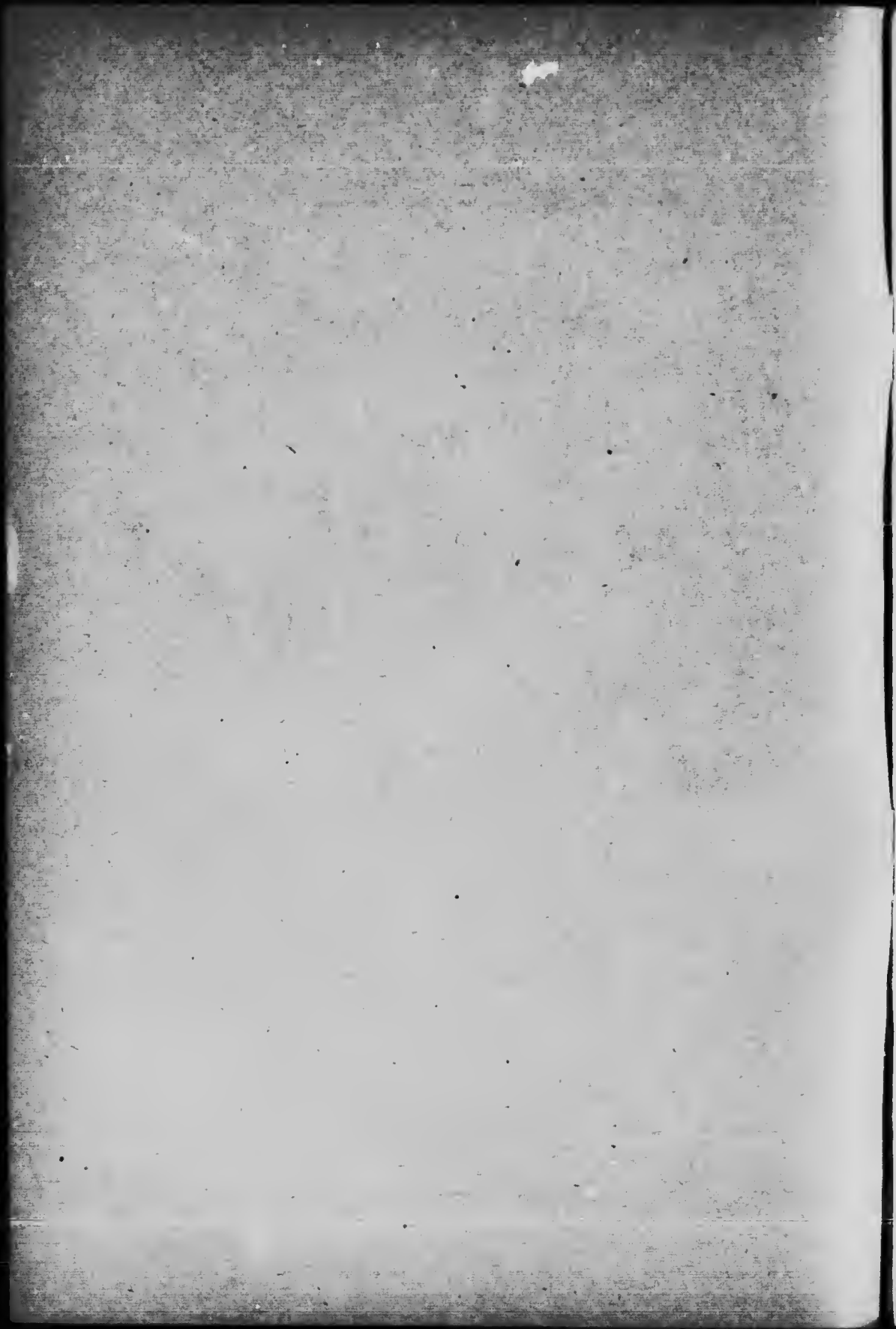
F. CHARLAN.

Tobacco Bulletin No. A-10

Published by direction of the Hon. SYDNEY A. FISHER, Minister of Agriculture,  
Ottawa, Ont.

OCTOBER, 1910

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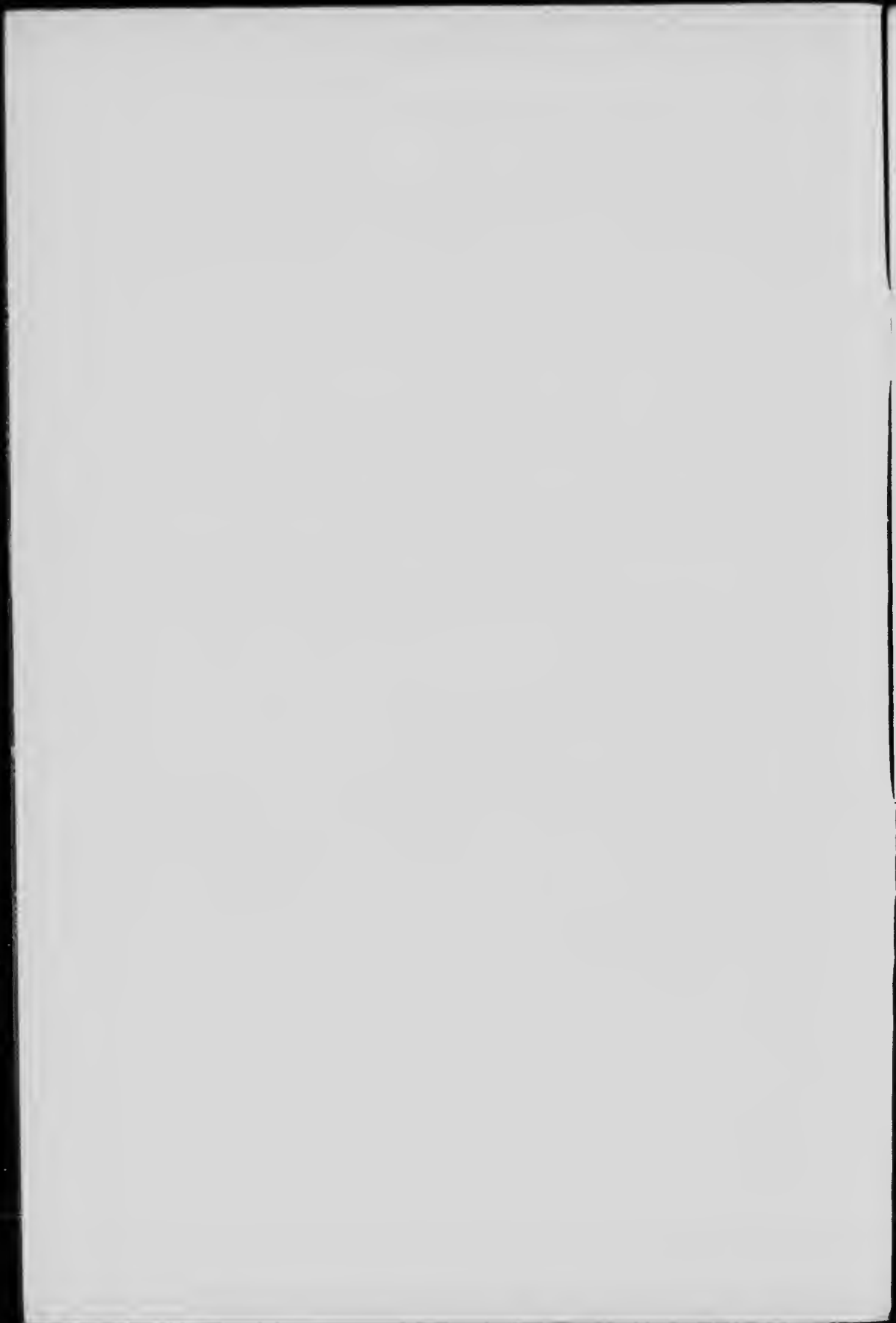
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Published by direction of the Hon. SYDNEY A. FISHER, Minister of Agriculture,  
Ottawa, Ont.

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OCTOBER, 1910

10110-1





To the Honourable,  
The Minister of Agriculture.

Sir:—

I beg to submit herewith Bulletin No. A-10 of the Series of the Tobacco Division, entitled: "Tobacco growing in British Columbia," which contains a summary of observations made during a recent trip in British Columbia.

The following points of interest for tobacco growers in British Columbia are discussed in this bulletin: the situation of tobacco culture in that part of the Dominion, and its possibilities from a purely agricultural point of view. Some advice is given for the guidance of beginners, who may not have found in our previous publications prepared especially for Ontario and Quebec growers, the information which they are in need of.

I beg to recommend that this bulletin be printed for distribution.

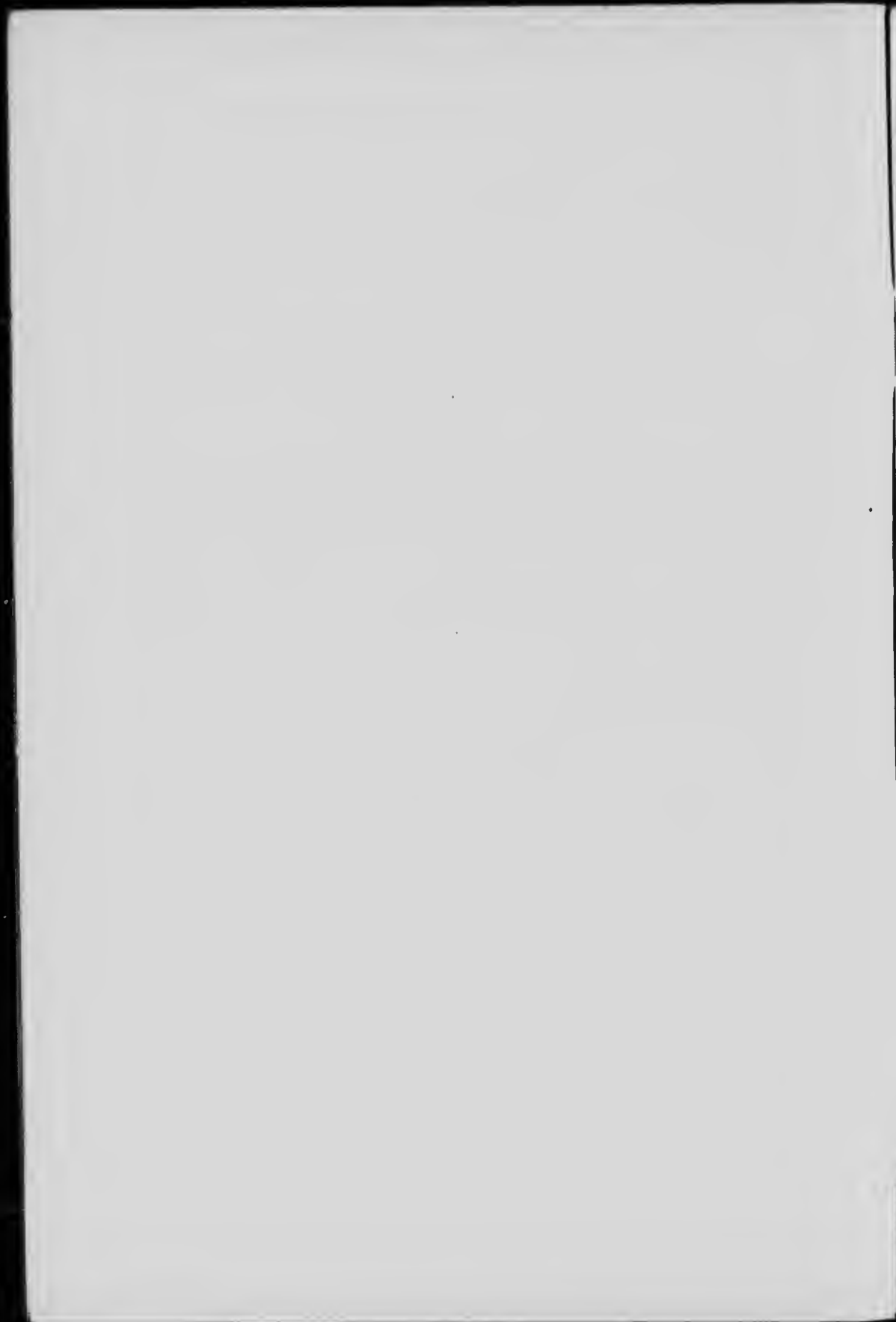
I have the honour to be, sir,

Your obedient servant,

F. CHARLAN,

*Chief of the Tobacco Division.*

OTTAWA, October 1910.



# TOBACCO GROWING IN BRITISH COLUMBIA.

(PRELIMINARY NOTES)

BY

F. CHARLAN.

While in British Columbia, during the latter part of August 1910, the writer had an opportunity to see standing crops of tobacco in the Okanagan valley.

The observations made at that time are presented in bulletin form, for the guidance of intending tobacco growers in British Columbia and to help actual growers to improve their methods.

Although fairly well established, tobacco growing in the Okanagan valley is not, as yet, entirely out of the experimental stage, and we wish to point out here some important questions that require elucidation, and the means whereby these questions can be solved.

## TOBACCO GROWING CENTRES.

There is practically only one centre of tobacco culture: the Okanagan valley and chiefly Kelowna, where this branch of farming is still quite new. It is only ten years since the first tobacco crop worthy of mention was grown in this district, but the industry has since progressed rapidly.

Until 1909 the growers were few in number, and the production of tobacco in Kelowna hardly exceeded 40,000 or 50,000 pounds; a larger area was planted in 1910, but even then the total land in tobacco was not more than 70 or 75 acres. This is quite insufficient considering the quality of Kelowna tobacco and its well deserved reputation, and we may expect to see the total amount of tobacco produced ten times as large at an early date.

Possibly, tobacco growing had been tried in other parts of British Columbia, but practically none of these trials was heard of until 1910. In 1893-94 an experiment was started at the Dominion Experimental Farm at Agassiz, but this experiment was not resumed, although the results were said to be encouraging by the experts to whom the products were submitted.

In 1910 there was a marked tendency in favour of tobacco culture in British Columbia. Numerous applications for seeds were received from different parts of the province by the Tobacco Division, and a careful experiment was undertaken by a large company, "The British Columbia Horticultural Estate, Limited," of Wallaheia, B.C. This experiment, if continued, might bring about a rapid increase in the production of tobacco in the province. The movement is not likely to stop and it may be assumed that, at an early date, in all parts of the province where good agricultural lands of sufficient size are to be found, tobacco will be one of the main crops.

## CLIMATE.

British Columbia, or rather the southern part of British Columbia, from the main line of the Canadian Pacific to the international boundary, may be considered as a country with a temperate climate. Winter is comparatively short and mild, the summer only fairly hot, less so than in some parts of Ontario or even of Quebec, spring and fall are very fine. However, owing to the great difference in rainfall, the region must be divided into two parts, sharply defined, the part where irrigation is practiced and without which it would be very difficult to secure satisfactory crops, and the part under more favourable conditions, where irrigation is not necessary, the rain being more frequent, and the precipitation evenly distributed during the whole of the year. Thus there will be two kinds of tobacco of a very different type, that grown on irrigated land and the other on non-irrigated land.

However, until the present time, tobacco growing was practically limited to the Kelowna valley (irrigated part) and only "irrigated" tobacco was produced. Soon, however, new centres will open in non-irrigated districts and then it will be possible to compare the two products so different in principle.

The following observations apply more particularly to the Okanagan valley; however, with slight modifications, they may be of some use to future tobacco growers in other parts of the province. Besides, an endeavour will be made to divide the subject matter under two heads: tobacco growing on irrigated soils and on non-irrigated soils.

## CHARACTER OF THE SOIL.

The soils of the Okanagan valley which have been selected for tobacco growing consist of a rather light coloured, grayish loam, light and deep, containing a large proportion of organic matter, and with a subsoil generally of a very porous nature.

Heavier soils have, at times, been utilized for tobacco culture and, naturally, the product obtained had a stronger taste. The presence of white alkali is not considered as an objection, unless it is in such proportion that the consistency of the soil is affected; it is a fact that the best burning tobaccos are grown on alkali lands. Unfortunately, while fermenting, such tobaccos become covered with a white efflorescence which, although it does not injure the quality of the product, detracts from its appearance and may render the sale of leaf tobacco difficult when dealing with manufacturers who are not aware of this peculiarity.

Tobacco has also been grown on bench land, in the immediate vicinity of Kelowna. The product obtained is far from being equal to that of the valley, the leaves being rather coarse in texture and the percentage of nicotine higher. It should be stated, however, that this tobacco was grown by inexperienced farmers. Probably, irrigation was carried to an excess, topping was done a little too low (that is to say the number of leaves left on the plant was too small) and harvesting a little too late. Such mistakes can easily be avoided, and it cannot be said, at present, that the benches of Kelowna are unfit for tobacco growing. At first sight, however, the soils of the valley appear to be preferable. But the proximity of the lake is not without objections. The ground water is at a shallow depth in the porous sub-soil of the Kelowna valley, and irrigation must be practised with caution, or else the effect might be more injurious than useful, on account of the imperfect drying of the surface soil and of the top part of the subsoil.

## VARIETIES.

The two main varieties are the Cuban and the Comstock Spanish. The Cuban yields an aromatic tobacco, with a short leaf, which is used as filler in the manufacture of cigars; the Comstock tobacco has a light aroma and a fine texture and is used for binders. The ribs are more prominent in leaves of the same thickness in Kelowna grown Comstocks than in Eastern Comstocks. As to the Cubans, none of the products obtained in other parts of the Dominion can be compared to them. Their burning quality and their aroma are of a high order. They will head the list for a long time among 'filler' tobaccos of Canadian growth.

The Comstocks grown in the valley are from seed imported from Wisconsin and acclimatized since several years. The Cubans are also from Canadian seed, which has been obtained from seed imported from Cuba and renewed after two or three generations. The leaf of the Canadian Cuban is slightly larger than that of the original Cuban and it increases in size as the seed is produced in Canada. Unfortunately, this increase in size is obtained at the expense of aroma, and this is why growers have to use imported seeds periodically.

However it is not known as yet what aroma could be secured by growing entirely acclimatized Cuban seeds, and it would be interesting to ascertain how far the Canadian Cuban would increase in size and what would be the final aroma.

Judging by the money returns, these two varieties are about equal. A good aromatic 'filler' will sell at a higher price than a good 'binder', but the latter will yield about twice as much in weight on the same area. On the other hand aromatic tobaccos must be handled with much greater care than binder tobaccos, particularly during the curing process. However the growing of 'fillers' appears to be a safe industry for the tobacco grower of British Columbia. There is as yet no competition in this branch, and competition will always be comparatively difficult while excellent 'binders' are produced in Eastern Canada, and at such cost that they may easily compete with British Columbia products. The British Columbia grower has a better protection in the climate of his province, which allows him to secure an aromatic product almost unique in Canada, than in his remoteness from the tobacco growing centres of the East, and in the high rates of transportation across the Rockies.

## SEEDLINGS.

On account of the mild climate of their province, British Columbia growers do not have to go to the expense of making hot-beds as must Quebec and sometimes Ontario growers.

Even glazed sashes can be done away with, although they may be useful at times to stimulate the growth of late seedlings. A good frame with 12 in. x 1 in. boards sunk in the ground to the depth of 4 in. x 5 in. and covered with a light cotton cover is all that is required in Okanagan to protect the young seedlings against severe weather and the sudden changes of temperature that may occur during the first part of the spring.

Provision should be made for the draining away of rain-water. The cotton cover may be set up as a tent, with sloping sides held up at the central part of the bed with a longitudinal bar which is supported by posts a few inches above the level

of the frame, or, again, the frames may be given a slope of about one inch per foot in the same direction as the exposure of the beds. The best exposure is south or southeast, in a place sheltered from the cold winds, but not shaded.

A layer of vegetable earth or mould, from 4 to 5 inches thick, is quite sufficient. Where vegetable earth cannot be had in sufficient quantity, a bed of good light soil, manured during the previous year or sprinkled with liquid manure, may be made and covered with a thin layer of sifted vegetable earth, from 1 to 2 inches in thickness. It is important that liquid manure sprinklings, which are sometimes used to fertilize the soil, should be done before the beginning of winter. In all cases, the soil should be turned over with a shovel as often as possible. This shovelling of the soil is a very cheap preventive remedy against mould or various diseases that would otherwise appear later upon the beds and check the growth of young seedlings. It will be all the more efficient if it is done in cold and dry weather, before the earth freezes up.

Wide beds should be avoided. They may be as long as the grower requires and as the place will permit, but the width should be such that all parts of the bed may be easily reached. A good width is four feet and it should never be more than five feet. The surroundings of the beds should be kept as clean as possible and all weeds carefully destroyed.

With regard to seeding, the reader is referred to our previous publications on this subject, bulletins Nos. A-1, A-8 and A-9 of the Tobacco Division. Let us insist, however, on the importance of thin seeding.

Cold beds, with a cotton cover and seeded with dry seed, may yield seedlings ready for setting out 60 or 75 days after seeding, according to temperature. It will be safer to prepare several beds and seed them at intervals of a few days. Early beds will be used for setting out or to start the work, and later beds for the latter part of the setting out, so as to avoid any undue haste in this work, and for replacing dead plants.

As soon as the work of setting out and resetting is completed, the beds should be entirely turned over with a shovel and the soil put under shelter until the time has come to regenerate it. To leave the beds as they are, with the unused seedlings, until they are infested by weeds, is a great mistake.

#### SETTING OUT.

The setting out or transplanting should be done at the earliest possible date. In the Okanagan valley this work may safely be started in the latter half of May. An early setting out offers many advantages. If the land has been well prepared by deep fall ploughing, it will have stored a large quantity of water, and will therefore require only comparatively light irrigation; it will dry better, will easily get into good condition and the seedlings will find all that is required for a quick growth: a moist, compact and mellow soil. A soil that has not been well prepared and which, therefore, requires abundant irrigation at a rather late date, is apt to be too damp at the surface and to dry imperfectly.

When setting out is done early, on a well prepared soil, the seedlings take root evenly and well, and if cultivation is started early, as soon as the plantation is well established and when resetting is completed, most of the moisture stored in the soil will be kept there. The growth will be regular, the yield in weight profitable and the

leaves large and of fine texture. It would be impossible to obtain a good leaf if the plants were exposed to periods of drought or humidity.

Setting out may be done by hand or by machine. Machine work is very satisfactory and much cheaper than hand work. It will be necessary, however, to look carefully over each row after the machine has passed, and reset any plants that may have been set too deep or not deep enough, as sometimes happens. This work may easily be done by a child following the machine.

*Distances apart.*—Generally speaking the fields of tobacco seen by the writer were set too wide apart. Of course it is very desirable that sufficient space should be left between the rows to allow for horse cultivation as long as possible, but it should not be forgotten that setting too far apart results in a decreased yield and in the production of tobacco with a thicker leaf and too high a percentage of nicotine.

A Comstock plantation set out at 30 in. x 18 in. is very easily cultivated. For the Cuban variety the distances apart should not exceed 30 in. x 15 in.

The ground should be gone over with a cultivator every ten days, as long as possible, and a little earth should be brought up against the plants each time, so as to hill them up slightly. This work should be stopped only when there is danger of injuring the plants. Cultivation should gradually get shallower; the main object of this work, when all the weeds have been destroyed, is to check evaporation and thus keep as long as possible the moisture stored in the soil and in the top part of the subsoil.

Weeding should be done at first with the hand hoe and the ground should be stirred around each plant. This work gives a further opportunity to make sure that the machine work was well done and to correct all defects.

*Cleaning or removal of the bottom leaves.*—This work, which consists in the removal of the lower leaves, which are almost in contact with the soil, is neglected in Okanagan. This is a mistake, as the lower leaves are of poor texture and always dirty; if removed at harvesting and left on the ground they are a net loss; on the other hand, if harvested with good leaves, they depreciate the crop, as they are a very inferior product. It is better to remove them at the time of the last cultivation so as to reserve all the food for the top leaves.

*Topping.*—Topping is generally done too late in Okanagan. With the Cuban varieties topping may have to be done in a special manner so as to reduce the percentage of nicotine in the product. This subject will be dealt with later. But with the Comstock, it is very important that topping be done early, so that top leaves may reach a normal size and ripen soon after the middle leaves. In this way the maturity of the products is more uniform when harvested.

It is a mistake to think that early topping will result in a decreased number of leaves. The terminal bud should be broken off by twisting it sideways or by pinching it between the fingers as soon as it appears and before it shoots up to open and form the floral cluster. When topping is done in this manner, 14, 16 and even 18 leaves are left on the plant. It is very seldom that a larger number of leaves can be left on Comstock Spanish plants. Topping is more easily done in the morning, when the leaves are swollen with water and the top of the young stem is brittle, as during the day the stem is more elastic and there is danger of tearing or splitting.

*Comstock*.—The Comstock being harvested in the latter part of August, the topping of this variety should be completed at the latest towards the end of July. No topping should be done after the 15th of August, even with very late crops. The writer has seen crops of Comstock that were being topped on the 26th of August to be harvested the next day, and in a few cases, the same day. The top leaves of such plants are only half grown, unripe, hard to dry, and unsuitable for wrappers.

*Cuban*—The leaves of this variety are comparatively small, even when Canadian seed of the second generation has been used. Therefore the yield in weight is smaller than with the Comstock Spanish. It varies from 900 to 1,100 pounds, and the latter yield is obtained only when special methods are followed.

Kelowna growers, at least those who have the most experience in growing Cuban tobacco, have a twofold object: 1. The heaviest possible yield. 2. A leaf with a light percentage of nicotine, so that it may be utilized in the manufacture of mild cigars.

Such results may be obtained, at least to a certain extent, by close planting. Although this method is one of the easiest and the most convenient for the growers, it appears to have been neglected so far.

Growers prefer to resort to the growing of suckers, and to late topping. Some crops are not topped at all, and, until the day before the harvest, they look as though they were kept for the production of seeds.

The Cuban is certainly one of the varieties that form the largest number of suckers. One of its chief characteristics is the great number of low suckers. So far as the writer has observed at Kelowna, single stem plants are by far the exception in a crop of Cuban; double stem plants, which come up when a seedling has been cut early by cut worms in plants, and plants with suckers starting from the base form the greater part of the crop.

Double and twin plants have generally two stems of equal strength and equal size, and each of these stems may be treated as an ordinary plant and suckered and topped according to its strength, but it is very seldom that suckers, even early ones, get to be of the same size as the mother stem. This secondary shoot is generally more slender and the leaves which it produces are smaller and comparatively narrower than those of the main stem. Generally they are lance-shaped.

The keeping of these suckers, provided they are topped at the right time,—at the same time as the main stem,—is certainly one way of increasing the yield and reducing the nicotine contents of the product. But a large proportion of the leaves have a coarse texture, they lack elasticity, and they take on a dark hue in the curing shed when they do not remain entirely green. At any rate, such suckers yield only a second grade product, if not quite inferior in quality, and when this system is followed, the quality of the leaves of the main stem is also affected.

To remove these suckers at a late date, as for instance at the time when they were observed by the writer on some crops of Kelowna, in the latter part of August, is certainly not profitable. Before resorting to such a method it would be more advisable to try closer planting, and remove the suckers at the proper time.

However, we are not entirely opposed to the culture of suckers. It is certainly one way of reducing the proportion of nicotine in the leaves and increasing the yield, but when such a system is followed, great care is required, whilst, as a general rule,



it is only a pretext given by the grower, too busy with other farm crops, to care as he should for his tobacco crop.

The same objections apply to the practice of delaying the topping until the plants have formed their seeds. It is true that in the formation of flowers, capsules and seeds, plant food is taken up, which, if not utilized in this manner, would have increased the proportion of nicotine in the leaves; but if the topping is to be done very late, it should at least be done at such a time that the top leaves may grow to a reasonable size and ripen. As it is now, topping is too often done the day before the harvest. On the 26th of August, most of the crops of Cuban in Kelowna were still in full bloom.

A mixed method of culture may have to be used. But it seems obvious that close planting will always be the chief factor in securing a maximum yield in weight, as well as a leaf of light texture, not too rich in nicotine but supple enough and gummy enough to cure well and yield an aromatic product. Such results will never be obtained by leaving on the plant all the axillary or bottom suckers that it may produce or by letting it almost ripen its seeds.

If these methods are to be followed, it should be with such care that all the elements that make up the quality of a tobacco leaf, viz.: texture, good drying and curing quality, and aroma, may be retained in their entirety.

Some growers are quite aware of the objections to these methods. They have used them in order to reduce the proportion of nicotine in their tobacco, but they admit that they are not satisfactory and that the question is not so simple as it seems.

To throw light on the question, the following methods should be tried, separately or in combination: 1. Total or partial growth of suckers (these being left on the crop or removed as the case may be). 2. Late topping, when the flowers are open or the capsules are almost formed. 3. Close planting; and the effect of these methods on the following should be ascertained:

- The yield in weight.
- The texture of the leaf.
- The curing quality.
- The fermentation.
- The proportion of nicotine.
- The aroma.

This will be the object of an experiment which will be started at an early date. However, this experiment does not involve any technical difficulties, and any grower who desires to get the most of his crop may undertake it for himself.

## HARVESTING.

In the Okanagan district, the growth of the tobacco plant is not quite so rapid as in the eastern parts of Canada. At Ottawa or in the neighbourhood of Montreal, the Cuban variety ripens in 70 or 75 days, whilst in the valley of Kelowna it requires 90 days to ripen. And apparently this period is not long enough, as the Cubans that were being harvested on the 26th of August were much too green and should have been left on the field 8 or 10 days longer in order to ripen properly.

Of course the season of 1910 has been exceptional, as unusually cold weather occurred during the latter part of August, but nothing had been done to hasten the ripening of the crop. The topping of the Cuban was barely started on the 25th of August. A very queer state of things was observed by the writer: A grower who had a splendid crop of Comstock, a little over-ripe, and a fine crop of Cuban, under-ripe, was harvesting the Cuban, running thereby the risk of getting a green tobacco and a filler lacking in aroma, and was leaving his Comstock ripening still more with the risk of harvesting thick 'binders,' with a strong proportion of nicotine.

It should not be forgotten that the curing or drying of tobacco is not merely a desiccation of the leaf, pure and simple. During the curing process, the leaf undergoes changes which prepare it for fermentation, during which the aroma develops. This applies particularly to the cigar leaf. This transformation cannot take place unless the weather is warm enough. The Okanagan climate and the climate of similar parts of British Columbia is exceedingly mild and remarkably regular, but in the fall the days are never very hot and the nights, even in summer, are almost always cool. All things being equal, the temperature of the curing sheds, during the months of August and September, is probably lower than in the curing sheds of Quebec and Ontario. Therefore, harvesting should be done early, so as to take advantage of the real hot days of August and perhaps of September, so that the curing may be satisfactory. This can be done if the seedlings are set out as early as advised in another part of the bulletin. In this respect the Okanagan grower is greatly favoured, as he can get his land into shape much earlier than the Quebec or even the Ontario grower, as in these provinces the work is often delayed by unfavourable temperature. There may be some truth in the assertion that by setting out the seedlings in the middle of June one can avoid the evil effects of the drought, which often occurs during the month of July and which stimulates the growth of flowers in the plants, but the same results will be obtained by early setting out. Full grown tobacco will stand the drought better than younger plants and by starting cultivation earlier it is easier to keep the moisture in the soil.

Tobacco requires a large quantity of water to grow to full size and yield products of good quality. But the excess of water is perhaps its greatest foe. The writer is convinced that the excess of irrigation or too late irrigation is more to be feared than the drought in Okanagan.

Therefore, the best way to secure full grown plants able to stand the drought of July and in good condition for harvesting from the 15th to the 30th of August, plants that can be put in the curing house at the most favourable time to insure a rapid curing, is to prepare the land early in the fall by deep ploughing, and to irrigate early and moderately in the spring, harrow as soon as the land is dry enough, and set out early.

As to the curing of tobacco, we shall not repeat here what has already been stated in previous publications, and particularly in Bulletin No. A-3. But we desire to call the attention of the Kelowna grower to one particular point: the first stage of the curing should not be pushed too fast, so that the yellowing of the leaves may take place perfectly. A great deal of the Kelowna tobacco is cured green or slightly so. This is a great objection from a manufacturing point of view, but such tobacco surely comes from plants which are harvested while yet unripe, or from plants the curing of which has been pushed too rapidly at first.

We trust that Kelowna growers who may recognize their methods here described will not consider the above as a criticism but merely as a discussion. We fully recognize the superior quality of Okanagan improved tobacco, and we would like to see this quality still improved by better methods of culture, and the profits of the British Columbia grower increased thereby. - No one will deny that there is still room for improvement.

All that has been said applies equally to all parts of British Columbia where irrigation is practised.

In some valleys, irrigation is not practised, although the rainfall is light. Tobacco grown under such conditions is what might be called 'dry soil tobacco.'

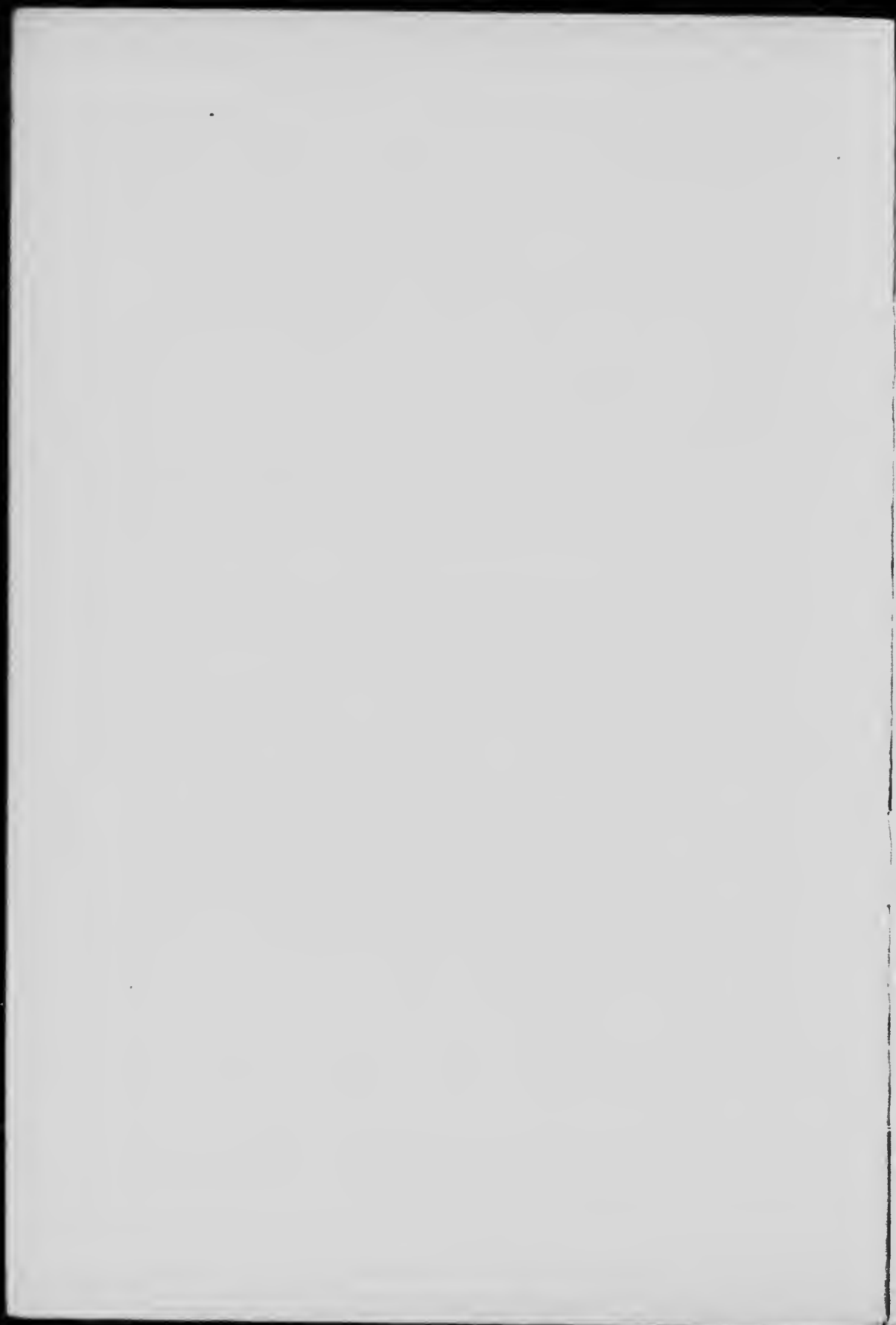
In those districts it will be necessary to till the land thoroughly in the fall and in the spring so as to store as much moisture as possible. The growing of Cuban only should be attempted; Brazilian varieties might perhaps be tried; but, in any case, no large tobacco may be expected.

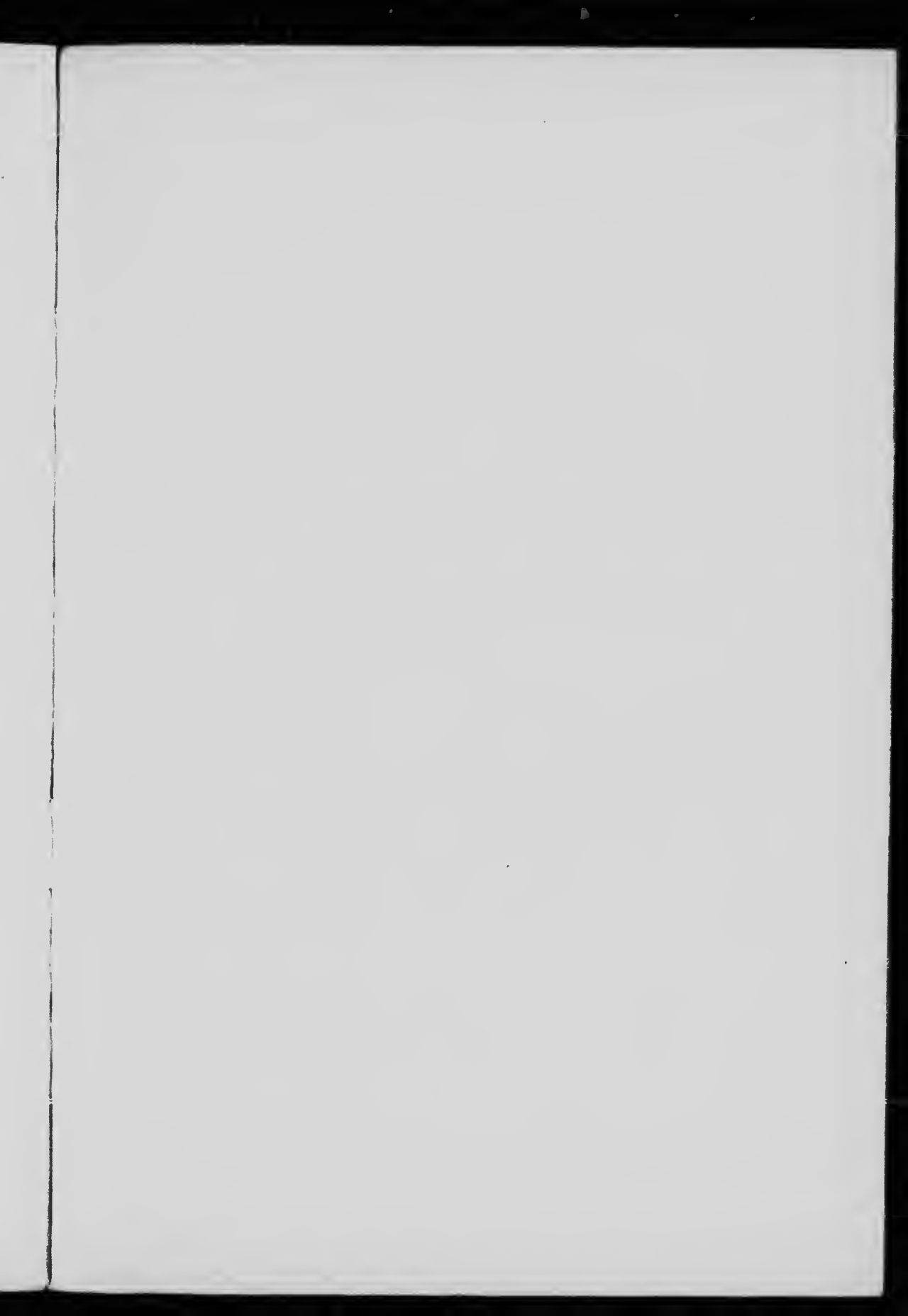
The maritime parts of the province, where rainfall is abundant, and whose climate may be considered as moist, have much more of the character of a tropical region. The Cuban tried at Agassiz yielded very large leaves, fine and silky. The aroma has not been definitely ascertained, but the experiment may be resumed so as to obtain information on this point.

In this warm and damp region, the grower's fancy may have free course in the choice of varieties. He should not forget, however, that it is better to limit the number of the latter, so as not to overstock the market with rather small quantities of products without neatly defined characteristics.

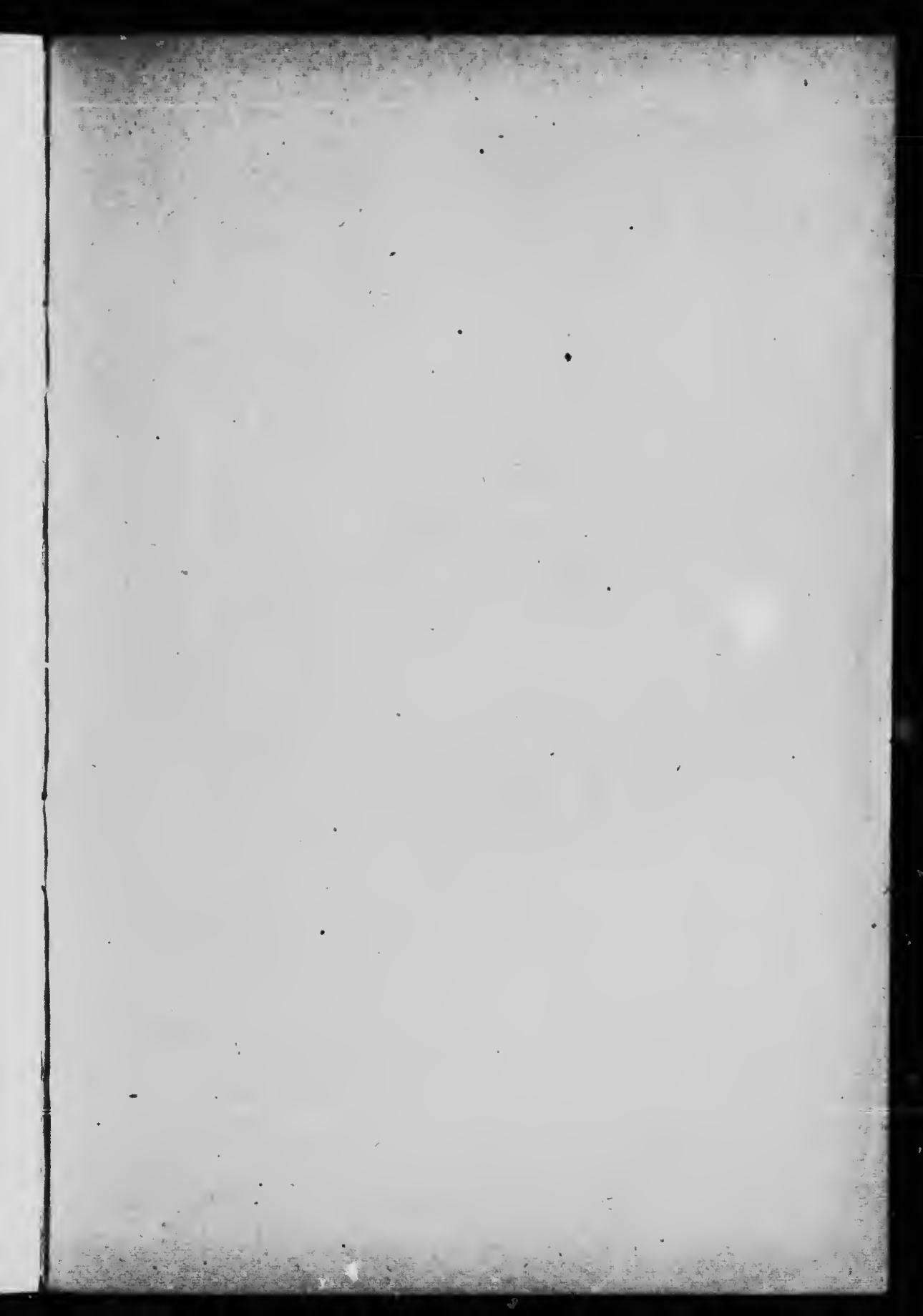
Tobacco for "fillers" must be light and aromatic, and such qualities we must have, even at the expense of a decrease in weight.

Leaves for "binders" or "wrappers" must be fine, elastic, of sufficient size, and of good shape, without coarse ribs, and with a neutral aroma. Which of these types is best adapted to the climatic and soil conditions of those districts of British Columbia where tobacco-growing is likely to be established remains to be ascertained by proper experiments.









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