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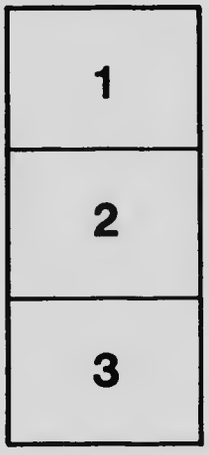
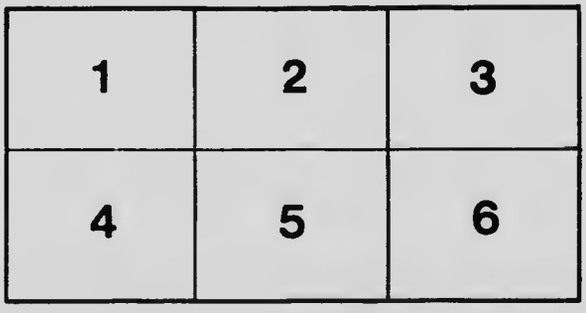
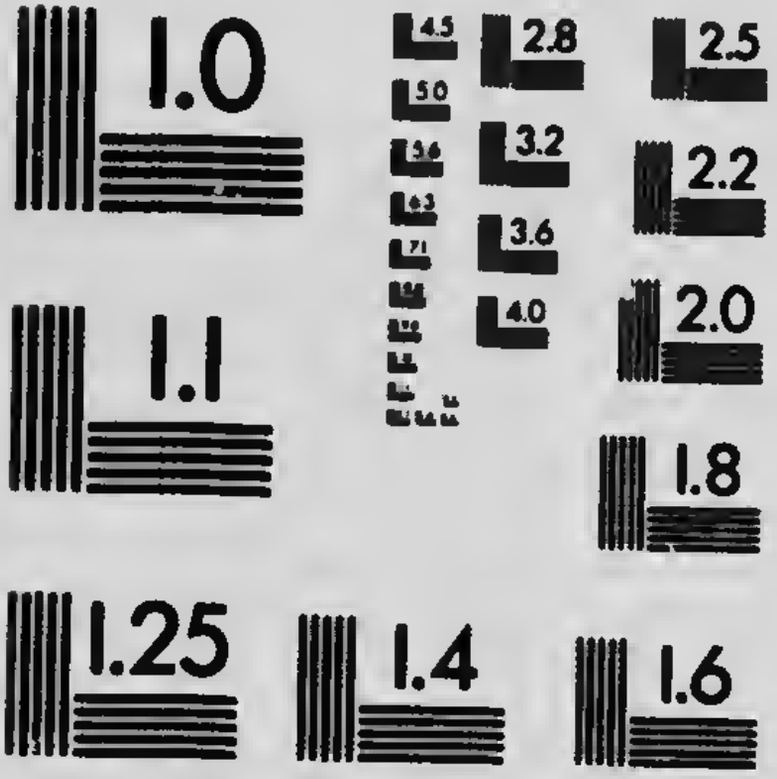




Ontario Department of Agriculture

FRUIT BRANCH

# The Cherry in Ontario

By E. F. Palmer.

## THE STATUS OF THE INDUSTRY.

The season of 1914, on account of the apparent overproduction of sour cherries, created a considerable amount of pessimism amongst the cherry growers of the Province. Many of them believe that the day of profitable sour cherry production is past for a good many years at least, and they point to the greatly increased acreage, together with last season's poor prices as evidence of over-planting. Certainly cherries have been extensively planted in Ontario in the last few years, and especially during 1908-09, the boom being induced by the sureness of a crop practically every year, the good yields, and the high prices received. The Dominion census figures for 1901 and 1911 show that for the ten years previous to 1911, cherries were surpassed by peaches only in the increased number of trees planted, they showing an increase of 31.3 per cent., while cherries were 21.9 per cent., ample evidence of the growth of the industry in this Province. Canada, as a whole, showed a *decrease* of 4 per cent. in total number of trees.

In Ontario, apples during the same period of years decreased practically 8 per cent. in total number of trees, pears decreased 12 per cent., and plums 32.9 per cent. The large increase in cherry plantings and the decided decrease in all other tree fruits, with the exception of peaches, would further seem to indicate over-planting in cherries. However, as non-bearing trees have increased 4.2 per cent., the decrease in apple orcharding is probably due to many of the old orchards in the Province passing out of profitable fruitfulness, and also to the San José Scale in some sections. The reduction in pear orchards, too, is due to the pear blight, prices being better during recent years than previously.

Though cherries have undoubtedly been very heavily planted in recent years, and much of this new planting is only beginning to be felt on the market, the writer is of the opinion that for the following reasons there will still be a profitable market for those growers who stay with the industry.

First, if extended markets are not found for the greatly increased production, the poorer growers will be forced out, since their profits will be smallest or their losses greatest. They have been able to stay in thus far and to make good profits solely by reason of the fact that in past years cherries have been "easy money." Yields have been good and prices high, so that cherries have probably returned a bigger profit for the money invested than any other of our tree fruits. Two or

three years of low prices will discourage many growers, and this, with a natural growth of the market, will again bring around a period of good prices, though it would perhaps be unreasonable to look for as high prices as in the past. The question might very well be asked here, "What is the minimum price that we can afford to grow cherries for?" In discussing this point with an up-to-date and practical cherry grower he stated that, in his opinion and experience, if pickers could be secured at 12c. per backet, and if baskets could be secured a little cheaper than at present, there would be a *reasonable* profit in sour cherries at 50c. per 11-quart basket. Not all growers, however, would make a fair profit at that figure, for as has been stated by others, the amount of profit a fruit grower makes is simply a

**A nicely headed sour cherry orchard. Trees that are high up in the air increase the cost of picking, pruning, etc.**

dividend on his ability as a grower and manager. The usual cost of picking, too, is above 12c. per basket.

Second, a year or more of low prices for fruit naturally tends to create a wider market, as people get into the habit of using fruits, and with many the habit stays in future years, when prices become more remunerative to the grower. This fact is one of the blessings in disguise for the fruit grower, accompanying a year of low prices.

Third, it is reasonable to expect that progressive fruit growers and associations will seek new markets for their fruit, and will exploit the old ones more thoroughly when prices in the old market channels through which they have been in the habit of disposing of their fruit are no longer so profitable.

Fourth, the low prices experienced last season and the general feeling of over-production will prove a great check to future planting for many years to come. One nursery states that whereas in previous years they have sold from 30,000 to 40,000 sour cherry trees, from present indications they are not likely to sell more than 4,000 or 5,000 for 1915 delivery, and these chiefly for replanting orchards or for home gardens. It then only becomes a question of when the first three factors, discouraged growers going out of the industry, increased consumption due to a period of low prices, and new and wider markets, establish a profitable balance with the increased production. Further, be it remembered that growers of comparatively large acreages of sour cherries say they made a fair profit from their orchards last year in spite of the prevailing low prices. This would lead to the conclusion that if prices do not improve as expected, the growing of sour cherries will become one of extensive culture—large orchards and few varieties, in which the cost per acre of all orchard operations is materially reduced.

A condition which undoubtedly had some effect, though just how much it is difficult to determine, on the cherry situation during the past season, was the European war, accentuating as it did an already existing financial depression. The fruit-consuming public was economizing in every way possible, and would not, therefore, buy fruit of any kind with the same freedom as in normal times. Peaches, though a notoriously poor crop, did not bring prices in keeping with the short supply. Shortly after the war broke out, too, the price of sugar advanced to such a figure that there is little doubt less fruit and less cherries were preserved than under normal conditions. It is open to question, therefore, if cherry prices would have been good under any circumstances. It is argued, of course, that the cherry season was well under way before the outbreak of war, and that, therefore, as prices were low before as well as after the war started, it had no effect on the cherry situation. A study of cherry prices year by year, however, reveals the fact that whereas prices are proportionately low for the earlier and poorer varieties, they usually advance fairly steadily and reach high-water mark with the later and better quality varieties. Contrarily, the season of 1914 showed very little, if any, improvement of prices with the advance of the season.

In summing up the status of the sour cherry situation as a whole, I am of the opinion that the man who is now growing cherries and who stays with it, giving his orchard intelligent care and management, and also paying attention to the marketing end, will find this fruit profitable now, and increasingly so in the years to come, though the day of "easy money" in cherries, sour cherries that is, is probably gone forever. (Sweet cherries are grown practically only in the Niagara district, where they comprise only about 10 per cent. of the total cherries. For this reason and because the market for them is still excellent, they are not taken into consideration here in discussing the situation as a whole.) The man, however, who goes out of a certain line of fruit when prices are low and who goes into whatever line of fruit is bringing big returns at the time, will always be just one step too late. In 1910, in the Townships of Clinton, Louth, Grantham and Niagara there were 20,618 bearing and 14,475 non-bearing cherry trees (trees under four years). This is a very large per cent. of non-bearing trees and represents those men who, because of big profits gained by others, are just getting into the industry. With the coming into bearing of their orchards there was bound to be at least a temporary drop in prices.

To the grower who has faith in the industry and who intends to give his orchard every possible chance to bring him returns, it is hoped that this bulletin

will be of some assistance. A great deal of care has been taken in its preparation to see that the matter contained in it is substantially correct and not misleading, and to insure this, Ontario's most successfully cherry growers and authorities have been freely consulted and their advice asked.

## Relative Importance of Sweets and Sours.

The development of the cherry industry in this Province, both in sweet and sour varieties, is of very recent origin. In the past fifteen years particularly the growing of sour cherries has made wonderful strides. A few years ago in sections outside of Niagara one could find only a few of these cherry trees in the home garden, or perhaps a few of the common wild cherry scattered along some old fence row, where they had been planted by nature. In the report of the Ontario Fruit Growers' Association for 1883 there appears a discussion on the subject, "Can Cherries be Profitably Grown in Ontario?" Mr. D. W. Beadle, of St. Catharines, for many years secretary of the Association in discussing the above question, said, "I do not believe that the planting of cherry trees, with a view of raising fruit for market, is likely to be a profitable business in this neighborhood—not at present at all events. At present I would hesitate to advise men to plant cherry trees with a view to profit." The above remarks seemed to fairly well voice the sentiments, as brought out in the discussion, of the entire meeting. In the 1891 report of the Association, Mr. G. Fisher, of Burlington, stated that "Cherries are being put out, but as yet no large plantations are fruiting." To-day, if one were to make enquiries in the Niagara or Burlington districts, he would find that cherries have been one of their most profitable crops, and that there are many acres of bearing orchards. The development of the cherry industry then, has been one of practically only twenty-five thirty years—and now the t is of over-production. At the present day there are many commercial orchards ... Ontario scattered over that part of the Province west of Toronto to the Georgian Bay, along the Lake Erie shore east of Toronto, and of course in the Niagara district.

The sour cherry is one of our most regular bearing tree fruits, a heavy cropper and an early bearer. It will do well on almost any kind of soil, providing it is well drained, except heavy damp clays or low-lying land. Our hardiest cherries are sour varieties, and they have, therefore, been planted over a much wider range than the sweet varieties. The probable northern limit of sour cherry culture is latitude 46 degrees. North of that the fruit buds are very likely to be killed by the cold winters, though the tree itself may be perfectly hardy, so that it is only rarely that a crop is produced.

The sour cherry is frequently planted as a filler in the apple orchard until the apple trees require all of the ground. It fills the prime requisites of a filler excellently, being comparatively small growing, and, as previously stated, an early regular bearer.

With the sweet cherry conditions are somewhat different. It is greatly limited in its successful culture by soil, location and climate. In general it might be said that the sweet cherry succeeds commercially only where the peach may be successfully grown. In the whole of the Niagara district there are not over half a dozen commercial sweet cherry orchards, most of the trees being not in orchards, but in some favored location near the house or along the road. From a survey of the Niagara district made in 1910, it appears that there were only about 7,200 sweet

cherry trees, or about one-tenth as many as there were sours at that time. In the townships of Niagara, Grantham, Louth and Clinton there were only 2,726 bearing and 846 non-bearing sweets.

## Propagation.

The great bulk of the cherries in this country are budded on the Mazzard (*Prunus Avium*), a sweet cherry stock, and the Mahaleb (*Prunus Mahaleb*), a sour cherry stock, usually regarded as hardier than the Mazzard. Morello (*Prunus Cerasus*) and bird cherry (*Prunus Pennsylvanica*) stocks are very hardy, and will no doubt prove valuable where extreme hardiness is required. The latter stock has been used at the Central Experimental Farm, Ottawa, with good results.

Seedling stocks are imported from France in the winter, planted the following spring, and budded in the summer of the same year if of sufficient size; otherwise they are allowed to grow for a year. Cherry stocks may be worked by either budding or grafting, budding, however, being the method followed commercially. The budded stock is usually taken out of the nursery row in the fall and either heeled in outside in a well-drained location or piled in bundles in storage houses, where the temperature is kept sufficiently low to prevent any starting of the buds. During the winter the stock is graded and packed for spring delivery. Trees are usually sold as two-year olds.

Regarding the two chief stocks, Mazzard and Mahaleb, the former is undoubtedly the best stock for the commercial cherry grower. Upon it varieties of either sweet or sour cherries make larger, thriftier, longer-lived and more productive trees. From the nurseryman's point of view, however, the Mahaleb is the best stock to use. It is cheaper, possibly hardier, more easily budded, the buds develop more quickly into saleable trees, and, as it stands in the nursery row, the stock is more immune from insect and disease attacks. The Mahaleb stock also seems to be better adapted to planting in heavier clay soils. But where the Mazzard is sufficiently hardy it is by far the best stock for the fruit grower. As regards hardiness of stock, this point seems to have been given more prominence in the past than it deserves. The northern limit of successful cherry culture is determined not so much by hardiness of stock as by hardiness of fruit buds. The tree will thrive but bear no fruit.

There has been considerable controversy in the past over the effect of fumigation on cherry nursery stock. In this connection the following statement was received on request, from Prof. L. Caesar, Provincial Entomologist: "I have seen no evidence of injury to either sweet or sour cherries from fumigation if this is properly done in accordance with instructions in autumn or early spring before the buds begin to burst. If, however, it is left off until growth begins, fumigation may do some injury. Even apart from it cherries planted so late as this seem much less likely to live than those planted in fall or early spring so that it is often hard to say whether failure of such trees to live or thrive is due to fumigation, or to late planting, or to carelessness in planting, or all or any two combined."

## Location and Soil.

With sour cherries location is possibly of secondary importance, except that low-lying land should be avoided. With sweet cherries, however, location is all important. The soil can be changed to a certain extent, but location cannot, so that it is best to look to location first, and then if the soil is not all that is desired, study and add to its requirements afterwards. Cherry

Trunk of Elberta grown on Mahaleb root, showing variation in size between the trunk of the graft and the root stock. The tree has been attacked at the junction by shelf fungus. Sweet cherries on Mahaleb stock are short-lived, as the above photos clearly indicate.

especially sweets, are very likely to be injured by frosts, cold rainy weather, etc., during blossoming time, so that a somewhat exposed situation in close proximity to a large body of water is desirable, as in such a location blossoming is retarded and the danger thus usually averted. The soil for cherries must be well-drained, as neither sweet nor sour varieties will thrive with "wet feet," the sweets being more susceptible in this respect than any other of our tree fruits. The cherry thrives best also on a light soil. Therefore, the ideal location and soil would be a somewhat exposed spot, rolling enough for natural air drainage as well as water drainage, with a deep gravelly, sandy loam top soil, either naturally or artificially drained, and sloping preferably to the north-east, so that blossoming may be delayed as long as possible in the spring. A district that is generally level is very likely to be frosty. Also a very sandy soil should, perhaps, be avoided, as it becomes too hot in summer and the trees are apt to be scorched out before they have made enough growth (four or five years old) to protect themselves.

With further regard to the influence of adjacent large bodies of water, it has been observed that orchards so situated and near the northern limits of cherry culture will succeed well and produce good annual crops when other orchards in the same latitude, but away from the influence of the water, suffer severely from injury to the fruit buds, even though the temperature during the winter does not fall any lower than in the former case. This peculiar condition is due to the fact that it is not so much the intensity of cold which kills the blossom buds as quick changes in temperature, short cold spells alternating with warm sunny weather. In locations near water its influence is to prevent such rapid changes in temperature, which are so hard on the blossom buds.

The sour cherry, as previously intimated, will adapt itself to more adverse conditions than will the sweet, and hence can be planted in less favorable soils and locations, provided the soil is well drained air drainage is good, and the trees do not blossom too early in spring to avoid injury from late spring frosts. It will adapt itself to a great many soils except a heavy, damp clay, or a low-lying spot, and possibly thrives best on a heavier soil than that recommended for the sweet cherry. A location in which there is standing water for any length of time, either above or a short distance below the surface of the ground, will not grow cherries any more than it will grow apples or peaches. "Wet feet" must be avoided at any cost.

The cherry, then, must have good under-drainage, whether natural or artificial. It must have good air drainage; and a light soil with a north-east slope for sweets in particular is to be preferred and should be secured if at all possible. A south slope should always be avoided for a sweet cherry orchard, as there is greater danger of sunscald, and also early blossoming is stimulated, which is undesirable. In planning to set out a young orchard, too much attention cannot be paid to the above points concerning location and soil. On them largely depends the success or failure of sweet cherry culture.

## PLANTING.

FALL VS. SPRING.—The cherry starts to grow very early in the spring, and, therefore, if spring planting is to be followed, the trees should be planted as early as the land can be worked, and, of prime importance, while the buds are still dormant. If the trees have started to burst their buds before planting, a large per cent., especially of the sweet varieties, will fail to grow. This brings up the question of fall planting, and so far as the observation of the writer has gone, fall plant-

ing is to be recommended over spring planting for districts at any rate where the sweet cherry will succeed. That is, it is to be recommended over spring planting as the latter is generally practised, which is after the buds have started—too late in the season for good results. In the colder cherry sections of the Province, and more particularly those away from the influence of a large body of water, it would be safer to test fall planting in an experimental way only. Much of the difficulty experienced by growers in getting sweet cherries to grow is due, I believe, to the trees being planted too late in the spring. Hence the advantage of fall planting, as the trees are in the ground and ready to start growth with the first signs of spring. It must be borne in mind, however, by those intending to fall plant that the nursery stock must be fully ripened up before being transplanted from the nursery row to the orchard. If trees in which the wood is not fully ripened up are secured from the nursery, winter killing is almost sure to follow. Other things being equal, the percentage of loss from fall planting will be less than from spring planting, as *ordinarily practised,* but, as previously intimated, poor results are probably usually due to the planting being put off until too late. If spring planting were done in time, that is, before any signs of growth appear, it is likely that almost, if not quite, as good results would be obtained as with fall planting.

Preparation of Soil.—With regard to the preparation of the soil before planting, best results will be secured if the land is tilled or cropped for one or two years previous to setting out the orchard. Green crops ploughed under add a large amount of humus to the soil and leave it in the best possible condition. A leguminous crop, such as clover or vetches, is especially good, since it increases the supply of nitrogen in the soil and promotes a strong growth in the newly-planted tree.

The preparation of the soil for planting should commence with fall ploughing, leaving clayey lands as ridged as is consistent with good ploughing. Cultivate the land down early in the spring, and plant the trees as soon as possible, leaving further cultivation until after this is done, as the importance of early planting when spring planting is practised, cannot be over-estimated.

Distance of Planting.—In common with most of our other tree fruits, cherries, and more particularly the sweet varieties, are usually planted too close together. Low heading is the slogan of the present day up-to-date fruit grower, but unless heavy cutting back is resorted to, it is impossible to keep a too closely planted orchard low headed. Sunlight and air are required by the tree for its development, and it naturally grows up in the air in direct proportion to the amount of each of these factors cut off by its crowding neighbors. Plenty of sunlight and free air circulation are also required for the development of strong fruit buds. The direct result, then, of too close planting is that the lower branches become unproductive and finally die away, and the productive part of the tree is that much higher up, making the operations of pruning, spraying and picking correspondingly more expensive. With closely planted trees it is also more difficult to cultivate and spray, and rot, to which most varieties of sweets especially are susceptible, is given the most favorable conditions for its development—a close humid atmosphere with very little air movement. During the past season the writer was in a sweet cherry orchard in the Niagara district in which practically half of the fruit was ruined by rot. This loss was a direct result of over-crowding of the trees (they being planted 16 ft. x 18 ft.), combined, of course, with unfavorable weather conditions. From this and other observations I would recommend that sweet cherries be planted at least 24 feet apart each way and sour cherries at least 18 feet each way. It would

perhaps be better to recommend 25 x 25 or *more* for sweets and 20 x 20 feet for sours, as even these distances would not be allowing any waste room. Just as much good fruit to the acre will be produced at these distances as if the trees were planted closer, and the fruit will not all be at the tops of the trees. Furthermore, all orchard operations will be facilitated and insect and fungous diseases will be far more easily controlled.

PLANTING.—In planting the chief point to remember is that the tree must be set firmly in the soil. I have been in young orchards of cherries and other of our tree fruits also, in which tree after tree had died from, according to the owner, some unknown cause. The cause, however, was not far to look for. A slight pull

**An orchard that would have been better to have been headed considerably lower and a saving thus effected in picking, pruning and spraying.**

would bring up many of the trees, especially the dead ones, and it became evident at once that their death was due simply to the fact that they had not been sufficiently "firmed" at planting time. This firming of the soil is of particular importance with light soils such as the cherry thrives best in, and great care should, therefore, be taken to see that each tree is firmly planted. In very light soils it may even be advisable to use a ram to firm the soil, as in such soils foot pressure is hardly enough. The firming simply insures that the soil is packed tightly around the roots, giving the roots every opportunity to draw moisture and food from it. A loose soil also dries out very rapidly, making it still more difficult for young trees in such soil to make a start.

In planting the tree, make the hole large enough to receive the roots without having to force them in; place a shovelful of black top soil in the bottom, set the tree in, throw in a few shovels of earth, shake the tree up and down a little to get the soil close to the roots all around them, firm the soil well with the feet, and finish filling in the soil, firming it constantly, but finally leaving a mulch of loose earth on top.

It would be quite possibly an economic operation with newly-planted sweet cherries to water them two or three times during their first summer.

In fall planting the tree should be set a little deeper than is usual for spring planting, and the earth mounded up for two or three inches around the trunk. Pruning should be left until the spring, as then any immature wood that is killed back during the winter can be readily seen and removed.

If one-year-old stock can be secured from the nursery so much the better, as the tree will transplant easier and thus stand a better chance of living. Apart from this consideration two-year-old stock is ordinarily preferred to the one year. It usually requires very little shaping when received from the nursery, the one-year stock holding no advantage in this respect.

## Cultivation, Fertilization, Etc.

Cultivation is one of the most important factors of success in commercial cherry growing. That is the generally accepted rule at the present time though only a comparatively few years ago an extremely opposite view was held. It is very interesting to read back in some of the older Annual Reports of the Ontario Fruit Growers' Association, where we find such statements as these: "Possibly we have no fruit tree that requires so little cultivation and dressing as the cherry. It seems to succeed best on our light soils, where no manure is used." (Report for 1881.) "The ordinary treatment is extremely simple. I will give you the secret. It is to plant the trees along the fence, and let them grow with the burdocks and berry brambles and anything that comes along." (Report for 1883.) "As M.. Gott suggests, we find that the cherry does better to be neglected a little, rather than to be cultivated, and fed and tended carefully. Those who grow the largest crops grow them on the outlying ground, where they receive very little attention." (Report for 1883.) Several years later the 1891 report of the Association showed that one or two of the more progressive cherry growers were coming to the conclusion that cherries could stand cultivation as well as our other fruits. The following statement by the late Linus Woolverton appears in the report for the above year 1891: "I was told that cherries should not be cultivated, and formerly I did not cultivate them. Of late I have cultivated a small cherry orchard, and the results were so much better that I cannot see the wisdom of the advice formerly given."

In the short space of thirty years the cherry industry has progressed from a state of almost total lack of cultivation to one wherein thorough cultivation is regarded as probably the most important factor. Cultivation is in one way a fertilizer itself for, apart from its great value as a conserver of soil moisture, it renders available food that the tree otherwise would not be able to use. Cultivation lets air and sunlight into the soil. Chemical actions of various kinds are thereby induced, liberating in turn plant food for the use of the tree.

Either clean cultivation with the use of cover crops, or intercropping the young orchard with small fruits, are both excellent plans, provided of course that good orchard practice is followed in either case. In the so-called cover crop method, the orchard should be ploughed under as early as possible in the spring (the cherry

is an early crop and hence should be one of the first parts of the orchard to receive attention in the spring), and cultivated thoroughly until about the time picking commences. Then, after picking is over, cultivate once or twice more and sow the cover crop which is to be ploughed under again the following spring. Care should be taken to stop cultivation soon enough to give the wood ample time to ripen up before winter, and so avoid danger from winter injury. Leguminous plants, such as red clover and hairy vetch, are excellent for use as cover crops, while rye, buckwheat, etc., are also good, though they do not add nitrogen to the soil as do the former. The many uses and advantages of cover crops as a regular practice in the orchard have been so freely discussed in various bulletins, farm papers, etc., that it seems hardly necessary to say anything further here. The time of planting, July or early August, depending mainly on the factor of soil moisture at the time, only

A young cherry orchard interplanted with small fruits. This intercropping should be discontinued when the orchard is five or six years old and the whole space given over to the trees.

need be mentioned. One other thing might be added; that a great deal of the value of a cover crop lies in the thoroughness of the cultivation of the orchard which accompanies its use.

The question is often asked: "When should I stop cultivating my cherry orchard in the summer?" Theoretically, cultivation should be continued as long as possible, but ceasing early enough to allow the wood to ripen up well before winter, which would be about the middle or end of July in the Niagara and earlier in the colder sections. Practically, however, cultivation usually stops when the early varieties start to ripen and picking commences, as time is valuable from then on for one thing, and also the limbs of the trees are so weighted down with fruit that cultivation is difficult. Young non-bearing orchards, of course, could and should be cultivated as long as possible—say to the end of July or even later—so

as to promote a strong and vigorous growth. It would be well too, if bearing orchards were cultivated some after harvesting is over, instead of ceasing cultivation with the ripening of the Early Richmond.

If the system of intercropping the young orchard be followed, one or two things must be remembered. These small fruits take a great deal of plant food from the soil, and care must, therefore, be taken that the soil is kept replenished with the necessary plant food, else the cherry trees will not make a healthy and thrifty growth. The trees, also, must be given more room as the orchard becomes older, which means that less and less room should be given over to the intercrop, and finally when the orchard is about six years planted, the intercropping should be discontinued. The usual mistake is that the intercropping is continued until it has injured the orchard trees by taking much of their food, and crowding them so that they do not obtain a free circulation of air or sufficient sunlight. In this connection it would seem advisable not to plant bush fruits in a young sour cherry orchard, as the branches of sour varieties start to spread early. Plant, therefore, strawberries or a root crop in the sour cherry orchard. With the sweets, which are high growing, there is no objection to intercropping with bush fruits.

Except in the case of a cover-crop ploughing may be done either in the full or the spring in the Niagara district. In other commercial sections preference should probably be given to spring ploughing as there is much less danger of winter injury to the roots, though a Prince Edward County grower regularly practises fall ploughing with, so far, no apparent injury. The advantage of fall ploughing, of course, is that it relieved the spring work.

Along with thorough cultivation one of our most successful sweet cherry growers practises heavy applications of barnyard manure supplemented with commercial fertilizers. He applies manure at the rate of about 15 tons to the acre, bone meal 400 lbs., and muriate of potash 200 lbs. This looks like pretty heavy fertilizing, but the grower claims that it more than pays him, and the quality and quantity of his crop certainly bear him out. Without doubt our cherry orchards generally could with economy be much more heavily fertilized than they are. The cherry is a pretty heavy feeder, and as the sweet varieties especially require light soils which are not very rich naturally (or at least they do not retain their richness when cropped long), the importance and benefit of fertilizing can be readily understood. The cherry will do fairly well on poor soil and in neglected spots, being more adaptable in this regard than any other of our fruits, but it will also respond wonderfully to careful thorough cultivation and liberal fertilizing.

## Pruning.

*Sour Cherries.*—In the past we have been led to believe that cherries should not be pruned at all heavily, but rather that pruning, if practised at all, should be very light, as otherwise considerable damage would likely be done to the trees. In the light of present knowledge it would appear that the sour cherry, and the sweet, too, really thrive with severe pruning; at any rate they should be given far more pruning than has generally been recommended in the past. The illustration on page 13 shows one of a dozen or more English Morello trees at blossoming time, which was "renovated" somewhat after the manner quite often adopted for old peach orchards. The main limbs were all cut back before growth in the spring to about one-foot to two-foot stubs without any apparent injury to the trees, for a very vigorous and productive new growth soon resulted. Before being cut back these trees were

very straggly in appearance, and, as is often the habit with sour cherries considerable of the fruit was borne in clusters at the tips of long, bare whip-like branches. The dehorning gave rise to branches which were productive throughout their entire length of extra large fruit of excellent quality. The profusion of blossom as shown in the illustration testifies as to the quantity of fruit for the amount of bearing surface on the tree. The photograph was taken the third season after dehorning.

The sour cherry is naturally very symmetrical in growth, and ordinarily requires very little shaping. Intercrossing limbs should be removed and some of the wood thinned out. I would not recommend the heavy cutting-back mentioned above as a general practice, but only in such cases where the trees have become unproductive through bearing considerable of the fruit in clusters at the tips of bare branches. With further regard to this habit of the sour cherry it seems reasonable to suppose that if the trees were kept sufficiently thinned out from the start there would be more likelihood of having fruit borne all along the branches. Fruit buds will not develop where there is a lack of sunlight and air circulation, and the sour cherry trees as we ordinarily find them are fairly dense, and certainly much thicker than would be recommended for any other tree fruit. It is questionable, however, if fruit spurs could be kept in a productive condition for any great length of time in any case, so that pruning should aim at the annual production of a fair amount of new wood.

An English Morello tree in blossom at the beginning of the third year after having had all of the main branches cut back to stubs of less than two feet long. The photograph therefore shows two years new growth.

A young sour cherry tree before and after pruning. Less pruning of this tree will be necessary from now on, as it is of sufficient size to bear well, and so will make less new wood. If more new wood than is being formed annually is desired, prune heavier in the dormant season.

*Sweet Cherries.*—The cut on page 16 is that of a sweet cherry tree in the orchard of G. A. Robertson, St. Catharines, and illustrates Mr. Robertson's method of keeping his trees low enough so that he can pick, prune, and spray his orchard with the most economy. The tops and centres of the trees are cut right out, with no apparent ill effects to the trees whatever, though as with the sour we have been led in the past to suppose that the sweet cherry would not stand such harsh treatment. It might be mentioned here that this method of keeping the centre of the tree open is one of the most effective ways of helping to control the brown rot which does so much damage where conditions are at all favorable to its development. Plenty of sunlight and free air circulation help materially in keeping this disease under control. Part of this pruning Mr. Robertson does in the summer time, part in the winter, depending a good deal upon whether bud formation or new growth is required, the summer pruning stimulating the former and winter pruning the latter.

The young sweet cherry, until it reaches the age for bearing, requires little or no cutting back, but it must, however, be thinned out a great deal. The object is to shape the tree rather than to prune for fruit, it being desired to get a low, well-spread, open-headed tree as quickly as possible. Long thin shoots result from heavy cutting back. It is essential that plenty of free air circulation be provided for, if, as previously intimated, the brown rot is to be successfully controlled; and to this end any unnecessary or intercrossing limbs should be removed as well as the centre of the tree kept open.

In common with what is now generally accepted as the best orchard practice for our tree fruits as regards heading, both sweet and sour cherries should be headed low, say 18 to 24 inches, at planting time. This low heading is of especial importance with sweet varieties, as it helps to protect the trunk of the tree from sunscald. Then there are, of course, the usual benefits from low heading of decreased cost of pruning, spraying, picking, etc. With the modern extension tools, cultivation can easily be given under the lower limbs of low-headed trees without material inconvenience, or chance of injury to the tree. Start the tree low if possible, allowing three to five main branches, and making these strong and sturdy and vigorous by keeping all unnecessary and intercrossing limbs cut out, forming a round-headed tree with plenty of lateral branches.

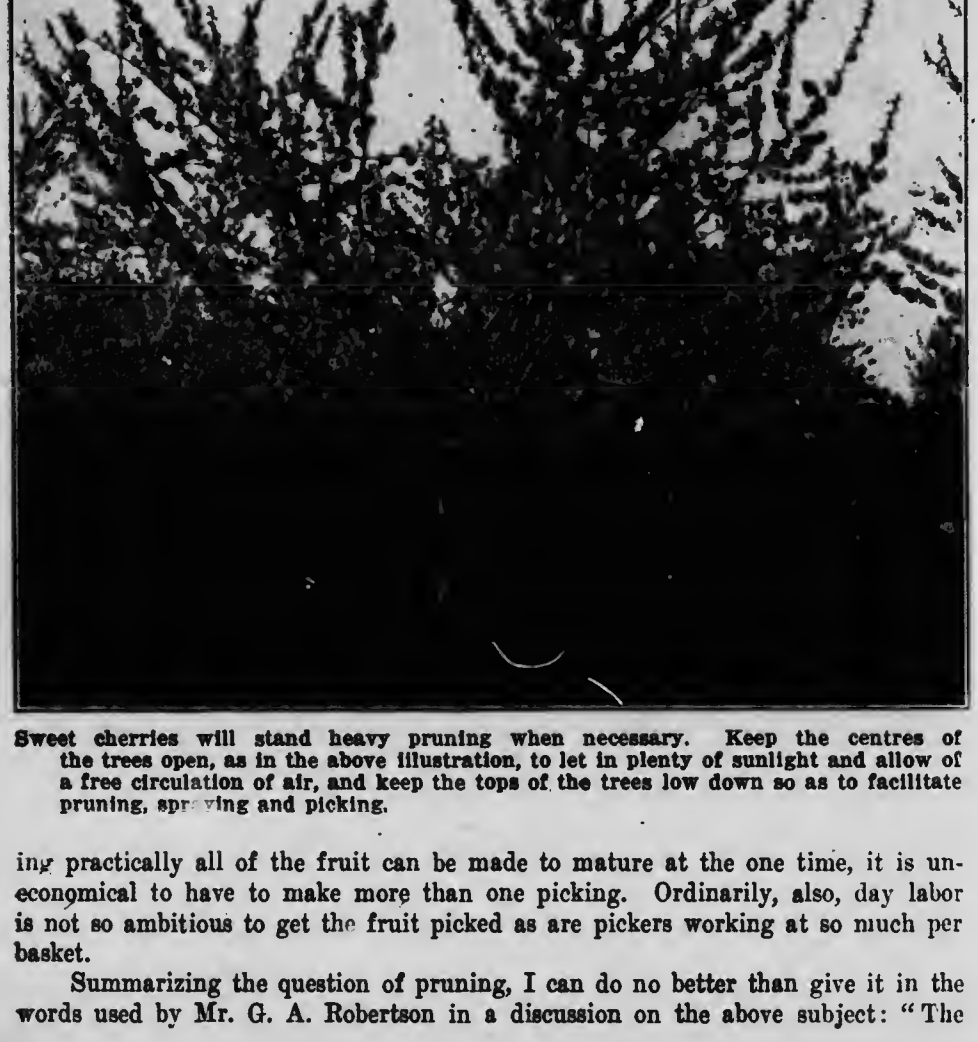
The above remarks on pruning are only general, and cannot be applied to every variety of cherry. For instance, the Tartarian cherry is a very upright grower, and should be kept down by letting some of the growths from the lower branches remain and cutting the top of the tree back. The Napoleon has a habit of forming long slender limbs without side branches, and in seasons of a heavy crop, bunches of small inferior fruit often form on the ends of the limbs. Therefore, it is advisable to keep the limbs stocky, and make them send out side branches by cutting them back.

Other varieties again grow too vigorously if pruned much in the winter, and it then becomes advisable to practise summer pruning on them occasionally or often as the case requires, doing the thinning out and cutting back of the top at that time. Each grower, therefore, should study the habits of growth of the different varieties in his orchard and modify the pruning of each to suit. So-called "winter pruning" should be done preferably just before growth starts in the spring or very shortly after. Summer pruning is best done about picking time.

Once the trees are in bearing, they need comparatively little in the way of pruning except to keep all weak and unnecessary limbs cut out, the centre of the

tree open to the sun, and the top of the tree within a reasonable distance of the ground. An annual production of new wood should also be maintained.

In discussing pruning and the keeping of the tree open, we ordinarily overlook one very important point; the fruit on a well-pruned tree ripens far more evenly than on a tree that is too thick. In such a tree, the fruit on the inner and shaded branches will much of it still be green and unfit when the rest of the fruit is mature. It is important to have the fruit ripen as evenly as possible, as pickers working by piece work naturally object to making two pickings. If pickers were paid by the day two pickings could, of course, be made. But if, by judicious pruning practically all of the fruit can be made to mature at the one time, it is uneconomical to have to make more than one picking. Ordinarily, also, day labor is not so ambitious to get the fruit picked as are pickers working at so much per basket.



**Sweet cherries will stand heavy pruning when necessary. Keep the centres of the trees open, as in the above illustration, to let in plenty of sunlight and allow of a free circulation of air, and keep the tops of the trees low down so as to facilitate pruning, spraying and picking.**

Summarizing the question of pruning, I can do no better than give it in the words used by Mr. G. A. Robertson in a discussion on the above subject: "The

pruning of cherry trees is absolutely essential to the production of good fruit. It is used to keep the tree down within bounds, where it may be sprayed easily, and the harvesting may be done easily and cheaply; by allowing free access of sunlight and air to prevent rot and help the sunlight penetrate and color the fruit evenly so that it may be harvested in one picking. Pruning is used to shape the tree, to cut off old unproductive limbs robbed of their fruit spurs by careless pickers, and to replace them with new growth. It is used in winter to force wood growth in sections where new wood is necessary, and in summer to counteract the effect of heavy manuring and unfruitfulness. (The heavy bearing of annual crops after bearing commences checks the wood growth sufficiently to counteract heavy manuring, and in conjunction with July planted cover crops prevents excessive wood growth and ripens the wood, hence annual summer pruning is unnecessary and where not needed would be harmful)."

## Picking, Packing and Packages.

The importance of picking fruit at the proper stage of maturity can hardly be over-estimated. Fruit picked before it is fit for consumption and put on the market early in order to receive for it a probable higher price for such early stuff has a very demoralizing effect on the sale of the main crop of that fruit when it comes on the market later on. The grape season of 1914 furnished an excellent object lesson in this regard—Niagaras were put on the market too green to be fit for consumption. The grocers and consumers got a "dose" of them, and the consequence was that by the middle of the season, when Niagaras should have been moving readily, nobody seemed to want them. In discussing just this situation at the 1914 Convention of the Ontario Fruit Growers' Association, Mr. D. W. Clark, one of the leading retail grocers of Toronto, said: "I do not think it is any benefit to the growers to ship out green grapes. If I got such a case as that, I would shift the fruit grower for the whole season." As Mr. Clark would do, so would other retailers and consumers, and as with grapes, so with all our fruits, cherries included. It should also be remembered by the growers that fruit picked too soon does not give the quantity that would otherwise be obtained by waiting a few days for the fruit to swell out and attain full size. It is likely that the increased quantity would then almost counterbalance the higher price for early stuff, and in addition there would be satisfied customers who would come back for more fruit.

For local markets, cherries should be picked when fit for consumption, not before. For distant markets, such as the middle west, they should not be picked until mature; that is, they should be well colored, of nearly full size, and with well-developed flavor, which would admit of their being picked several days before picking for the local markets. There is, perhaps, no objection to starting the picking for the local market at this time also, but it should not be started before the fruit is *fit for food*. Such a practice, if continued, cannot but have a deleterious effect on the market later on. Cherries can be picked and shipped long distances even after they are fully mature. Shipping over-ripe fruit is, of course, objectionable also, but not so much as shipping it immature. Over-mature fruit is practically useless for shipment, as it will not stand handling, and arrives unsaleable.

Just here it might be mentioned that, if a variety ripens unevenly and it is impossible to get an even maturity by pruning, fertilizing, etc., it is not the best practice to gather all of the fruit at one picking, but rather make two, taking off such fruit as is of good size and color at the first picking and the rest later, when

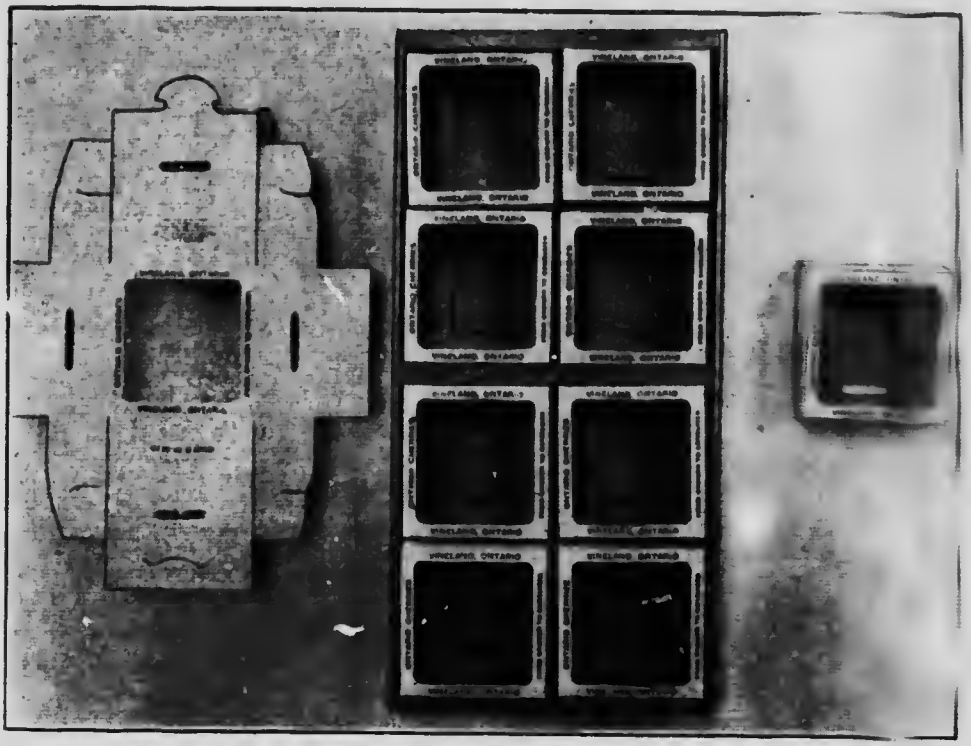
it has become larger and better colored. By this method the fruit left after the first picking will increase rapidly in size and will make just that much more bulk of fruit. The main idea in making the two pickings, however, is to have an even grade in the basket.

In the actual picking of the fruit, the principal points of importance are: first, care when the fruit is for market in picking it *with the stems on* (of no importance when for the canning factory); and second, care in not pulling the fruit

A good type of young sweet cherry tree.

spur off to which the stem is attached. Many fruit spurs are pulled off by the pickers along with the fruit, which reduces the bearing surface for following seasons. In some cherry sections of Canada and the United States it is the practice to guard against this by clipping the stems, of the sour varieties especially, with s[illegible]ors. The stem of the sweet varieties parts more readily from the fruit s[illegible]ce it is not so necessary to clip them. The fruit can be picked almost if [illegible] quite as rapidly when using scissors, and it certainly presents a neater and more attractive appearance in the basket; besides which, of course, many fruit spurs have been saved

for the next season's crop. Also when the fruit is clipped there is no temptati for the pickers to pull the fruit off without the stems. If there is much fruit the basket picked without stems the juice which exudes from such cherries will mak the whole basket wet, sticky and unattractive, so that on the market it sells for very low price. A Michigan grower, Mr. Burton Gebhart, harvests all of his cherries by clipping the stems, and claims he gets on an average 75 cents more on a 16-quart crate of cherries with clipped stems than for unclipped. As it takes from two to two and a half quarts more of clipped stem fruit to fill a 16-quart crate, than where the whole stem is left on, this leaves a clear profit of 40 cents per crate over the unclipped stems. (From an article by T. A. Farrand, in American Pomological Society Report, 1904-5.)



The eight carton cherry box, used, either with or without cartons, in the west for shipping the better grades of sweet cherries.

A possible objection to clipping the stems is that the cut end is sharp, and, therefore, liable to puncture the skin of another cherry. But at any rate clipping is a practice that is worthy of trial in Ontario. The stem should not be clipped short off, but should have about three-fourths of its length left.

Never pick and ship cherries, sweets especially, when they are at all damp from dew or rain. Such a condition greatly favors the spread of brown rot, causing considerable loss before the fruit finally reaches the consumer. As soon as the fruit is picked, the full baskets should be placed in the shade somewhere, *not left in the sun,* until shipped or taken to the packing house for sorting, facing, etc.

If the crop is to be disposed of to the canning factory the fruit should not be picked until ripe, and to this end two pickings should be made if necessary. If

much of the fruit is picked before it is matured, the grower will lose in weight of fruit (see page 16, second paragrapn). Also the factories often prefer to have the cherries pulled from the stem in picking, as this saves them the expense of stemming the fruit themselves—and if the fruit is unripe the stem will often pull out the pit in the operation of picking, causing an additional loss to the grower in total weight of fruit.

Pickers are usually paid by piece-work, 15c. to 20c. per 11-quart basket. Supervision of the pickers should be very strict, so that careless rough picking, picking without stems, and poorly filled baskets can be guarded against. Also the pickers should be made to gather as much of the fruit as possible from the top of the trees with step-ladders rather than by climbing around inside the tree, which often results in scraping the bark badly and knocking off innumerable fruit spurs.

Coming to the question of packing and packages, all green, decayed or cull fruit of any kind should be carefully graded out and the fruit faced enough to give the package a neat attractive appearance. Placing the stems down so that they cannot be readily seen from the top of the basket, helps very materially. A single decayed cherry in the basket will quickly spread the disease to surrounding cherries, thus causing considerable loss by the time the fruit reaches the retailer. To protect himself the retailer has then to put on an extra increase in price to cover the loss from decay and the labor involved in picking over the fruit. A prominent Toronto grocer estimated that fruit retailers have to allow almost 10 per cent. to cover loss from shrinkage and decay before the fruit is finally sold to the consumer. Part of the difference between the returns to the grower and the price to the consumer can then be traced directly to careless grading and packing by the grower.

In distant shipments it is advisable to use the 6-quart basket rather than any thing larger. There is less bulk of fruit in one package, with the result that the fruit stands up under shipment better and arrives on the market looking fresher and brighter. The less the bulk of fruit the greater the circulation of air through it, and this helps greatly in reducing loss from decay both in transit or after it has been exposed for sale. For local markets where the fruit is on sale a comparatively short time after picking, the 11-quart baskets possibly serves equally as well as the 6-quart so far as the condition of the fruit is concerned, though for a handy quantity of fruit as required by most consumers the latter size is preferable.

Fancy packages, such as the one used in the west for sweet cherries, have been very little tried in Ontario. That there is an excellent opening for such a special trade could it be worked up, there seems no reason to doubt. The difficulty will be, of course, to get such a trade in home-grown fruit established. A grower in the Niagara district who tried the western carton package (illustration on page 19) has the following to say of his experience: "The cherry season being so short it is a difficult matter to interest merchants who handle fancy packages. I think it could be done if one would make a business of putting up fancy packages of all fruits right through the season."

That there is a market for fancy sweet cherries in a fancy package is indicated by the cherry imports into Canada from the United States as tabulated below:

| | Lbs. | Value. |
|---|---|---|
| 1901 | 105,297 | $9,517 00 |
| 1905 | 157,928 | 15,094 00 |
| 1910 | 318,680 | 40,375 00 |
| 1913 | 969,986 | 102,855 00 |
| 1914 | 1,072,300 | 119,021 00 |

It is reasonable to assume that the great increase in cherry imports since 1901 as shown by these figures, is largely in the fancy package trade, as the other trade is well supplied locally. There must be, therefore, a certain trade that demands the fancy package fruit and is willing to pay the extra price for this class of goods. One thing must be borne in mind, however, if endeavoring to cater to a fancy trade. The fruit must be fancy, and it must be put up in an attractive fancy style. No half-way measures are likely to bring success, but rather tend to discourage the shipper.

## Markets.

The bulk of the cherry crop is disposed of in local markets and to the canning factories, and, until the past season, prices have been exceptionally good. Local consumption has certainly increased greatly in the past few years, and a steady increase may be reasonably looked for in the future. Perhaps the greatest market development, however, has been, and is yet to be in the middle west provinces, Manitoba and Saskatchewan. A few years ago comparatively few cars of tender fruits were shipped west, while now many hundreds of mixed cars of tender fruits are shipped there each season. One Fruit Growers' Association alone, the St. Catharines Cold Storage Company, shipped during 1913, 178 carloads of fruit, or nearly one-third of its total shipments. This development has been one of the past ten or twelve years, but until the season of 1914 cherries were practically not included in these freight shipments, though considerable went to the west from various points by express. The experiment of 1914 has shown that the cherry can be profitably shipped west by freight, thus avoiding the heavy express charges, and we may, therefore, look for a great extension of this market in the future.

A factor which seems destined to play a prominent part in the future extension of the western market and other distant markets also is that of pre-cooling before shipment. On July 16th of the past year (1914) a car of Montmorency cherries was pre-cooled and shipped west under the direction of the Dominion Department of Agriculture from the new pre-cooling plant at Grimsby. The car was sold in Winnipeg on commission for 60c. per basket. At the same time other sour cherries were selling in Winnipeg markets for from 38c. to 42c. This speaks for the superior quality of the pre-cooled fruit.

In an address on pre-cooling given at the 1914 Convention of the Ontario Fruit Growers' Association, Mr. Edwin Smith, who is in charge of the Grimsby Cold Storage Plant, had the following to say. "It must be understood that to pre-cool fruit it is not always necessary to have an elaborate and expensive plant. Anything that lowers the temperature of the fruit previous to shipment tends to check its ripening processes and postpones decay. At Summerland, B.C., a type of plant is being experimented with that costs from $1,500 to $3,000, and is giving splendid results. At Mission and Hatzig, B.C., the Provincial Department of Agriculture has carried on experiments to show the beneficial results of using the cold night air that they have in that region, and also by picking raspberries in the early morning, while the dew is yet present, and removing the moisture by fanning in a dehydrator before shipping." But, as also pointed out by Mr. Smith, pre-cooling is not a panacea for all ills and will not make over-ripe or injured fruit arrive in good condition. Carefulness in picking, packing and handling at all times is a prime necessity whether the fruit is to be pre-cooled or not. Such carefulness will possibly accomplish more than will pre-cooling alone.

Coming more directly to the question of pre-cooling, cold storage, etc., as affecting the cherry industry, the following letter was received from Mr. Edwin Smith:

"Referring to the application of refrigeration to the marketing of Sour Cherries in Ontario, I have found that if these cherries are properly harvested they may be held in splendid condition for local and semi-local markets for from seven to ten days if a medium low temperature is used, viz., 32° to 36° F. For local canning factories this time may be lengthened to two weeks. Refrigeration will thus tend to regulate the supply to the demand by eliminating the necessity of consigning on commission the surplus, which always causes "gluts." This period of storage also gives a chance to supply late orders and neglected points that do not usually get all the cherries they could use. For canning factories this period of storage is most important since the amount of fruit that may be taken care of in two weeks additional time is tremendous.

"No doubt we will see the greatest development in the use of Cold Storage with cherries in connection with the western markets. During the past season we demonstrated the splendid conditions in which Sour Cherries may be marketed in Winnipeg by pre-cooling for refrigerated freight. Fruit for this manner of shipment may be assembled over three days. The cost of freight and icing amounts to $140, whereas the cost of shipping this amount of fruit by express would be $400. This may mean that the growers can receive $260 more for a carload of fruit shipped in this manner or what would seem better, that the carload may be sold in the west for $260 less and more fruit be sold.

Crate used in British Columbia for shipping sweet and sour cherries in. Such a package is unexcelled for long-distance shipments, as there is only a small bulk of fruit in each basket.

"By pre-cooling and shipping by refrigerated freight there is no doubt but that a tremendous increase in consumption of Sour Cherries in the west may be had. The firm handling the car of cherries that we experimented with stated that without question they could handle several straight cars of cherries if they arrived in as good condition. I would not want to think that there is any fruit in Ontario that has been over-planted until we make an effort to market it. Ontario growers have scarcely begun to make this effort.

"I trust that I have made myself clear that by proper cold storage facilities local markets may be improved as well as increasing the consumption, the canning season may be lengthened for from ten days to two weeks, carloads may be assembled for western shipment, thereby placing the cherries in the west in good condition, increasing the returns, widening the markets and increasing the consumption."

It has usually been contended that the western market wants fancy fruit put up in fancy packages, and that they are willing to pay the price for it. There seems now, however, a growing tendency on the part of the consumer there to demand not so much fancy fruit at a fancy price as *good* fruit attractively put up at a more moderate price. It is fair to assume that, relatively, only a small propor-

tion of the consuming public there can afford to buy sweet cherries in cartons, such as those shipped in from the Western States. A great many people, however, could afford to buy Ontario cherries, well graded in the 6-quart basket. It is to this class of trade that Ontario must look to dispose of the bulk of her cherry crop.

## Cost of Production.

Growers would do well to make it an annual practice to keep close track of what each crop they are growing actually costs them to produce. If market returns have also been systematically kept they are then in a position to know exactly what profit per acre each crop is bringing them. If they simply keep track of their total profits, as shown by their bank account, they may actually be losing money on one or more of their crops, and yet not know it. The figures given below will serve as a guide to those wishing some idea as to a fair basis for reckoning their cost of production, and a basis with which to compare their own figures. These figures are based on the experience and practise of the growers who supplied them, and give their ideas on cost of production and returns that may reasonably be expected.

The following estimate for sweet cherries was worked out by S. H. Rittenhouse, of Jordan Harbor, and is based on an acre planted with about 100 trees, half white and red, and half black and dark varieties. At ten or twelve years of age, Mr. Rittenhouse estimates each tree should yield twelve 11-quart baskets of fruit.

### Sweet Cherry—Cost of Production.

| One acre of Bearing Orchard, valued at $1,000: | Cost. |
|---|---|
| Interest on above at 6 per cent. | $60 00 |
| Taxes | 10 00 |
| Cultivating during season | 15 00 |
| Pruning | 3 00 |
| Spraying | 15 00 |
| Fertilizing | 30 00 |
| Picking and Packing | 216 00 |
| Packages | 54 00 |
| Delivering to Shipping Point | 6 00 |
| Cost of Management (Supervising) | 50 00 |
| Total Cost | $459 00 |
| Returns: | |
| 1,200 Baskets (11-qt.) at $1.00 | $1,200 00 |
| Net profit | 741 00 |

### Sour Cherry—Cost of Production.

A. W. Peart, Burlington.

One acre of sour cherries (*Montmorency*)—trees 18 ft. x 18 ft. or 16 ft. x 20 ft. apart; trees worth $500 per acre, land worth $100 per acre; about 140 trees to acre.

| Cost of Production: | Per Acre. | Per Tree. |
|---|---|---|
| Interest on $600 at 6 per cent. | $36 00 | $0 26 |
| Taxes per acre | 2 80 | 2 |
| Cultivation | 9 80 | 7 |
| Pruning | 7 00 | 5 |
| Spraying, Material, etc. | 11 20 | 8 |
| Fertilizing | 16 80 | 12 |
| Cost of Handling Crop: | | |
| Picking and Packing | $105 00 | $0 75 |
| 11-quart Baskets and Teaming | 35 00 | 25 |
| Interest on Machinery and Depreciation | 7 00 | 5 |
| Insurance on trees, plant, etc. | 2 80 | 2 |
| Cost of General Management | 11 20 | 8 |
| Gross Cost | $244 60 | $1 75 |

**Average crop per year for 5 successive years, trees 7 to 14 years old, in bearing, equals 5 eleven-quart baskets. Gross cost, per eleven-quart basket, 35c.**

**If the grower sells at station f.o.b. at 35c. per basket, he has a profit of 6 per cent. on original investment. If he sells at 44c., he has a profit of 6 per cent. on other operations. If he sells at 49c. he has a net profit of 25c. per tree, which capitalized at 6 per cent. gives the tree and land it occupies a value of $4.20.**

Mr. P. E. Angle, Superintendent of the Lynndale Farms, Simcoe, Ont., has prepared an estimate of cost of production, returns, etc., in connection with a special article for this bulletin on Sour Cherry Culture, and the reader is, therefore, referred to this article, page 38, for further information on cost of production.

## The Most Important Insect Pests of the Cherry.

Cherry Fruit Fly: Two species are commonly found attacking the cherry, *Rhagoletis cingulata* and *Rhagoletis fausta*. The adult insects are two-winged flies, about two-thirds the size of the House-fly. The wings are conspicuously marked by dark crossbands. Flies of one species begin to appear about the end of the first week in June, and of the other species about June 11th. They feed on whatever they can find on the surfaces of the leaves and on the juice of injured cherries when these become ripe. Egg-laying starts about ten or twelve days after the time the fly emerges, the eggs being laid just under the skin of the cherry. They hatch in about five days, and the maggots are full grown by the time the cherry is ripe. On leaving the fruit the larvae work into the soil about an inch or go down cracks, if the surface is hard, and there change to puparia, remaining dormant in this form until June of the following year, when they emerge as flies.

*Means of Control*: From results obtained from extensive experiments, L. Caesar, Provincial Entomologist, recommends the following: Spray with 2 to 3 lbs. arsenate of lead (paste) to 40 gallons water, sweetened by the addition of one gallon, or nearly one gallon, of cheap molasses (Black strap). The molasses should not be added to the water until the day that the mixture is applied, because it will soon ferment in hot weather and cause the arsenate of lead to be precipitated in a lumpy condition.

The first spray should be made as soon as the flies begin to appear, which in the Niagara district will be about the end of the first week in June, and in colder districts a few days later. This will be about the time the Early Richmonds are beginning to show the first signs of a red blush. The second application should be made ten or twelve days after the first, or just before the blush begins to appear on any of the Montmorency cherries. If there is no rain after the first application, the second may be postponed a few days longer, but should never be put on any trees after the cherries are beginning to ripen, because of the danger of its remaining until picking time. If heavy rains come soon after the first application and wash it nearly all off, the second application should be made a few days earlier than it would otherwise. At the second application none of the early varieties should be sprayed.

In applying the spray, the trees should be given just a moderately thorough application, so that nearly every leaf will be lightly covered.

Plum Curculio (*Conotrachelus nenupher*) is often a serious pest of the Cherry. The adult is a rough looking, thick-set, grayish-black snout beetle, about one-fifth inch in length. Eggs are laid on the green cherries, and a small crescent shaped cut made around each egg puncture. The larva on hatching enters the

fruit and feeds around the stone until full grown. It then leaves the fruit and enters the soil where it transforms to a white pupa. Three or four weeks later, the adult beetle emerges and feeds on various things such as apples, etc., until the first frosts, when they hibernate for the winter under grass, leaves, etc., in or near the orchard. In the spring they commence to emege just before the fruit trees bloom.

*Means of Control*: Clean up all old brush piles, weeds, etc., where the insects hide. Cultivate well until the cherries are ready to pick. This and the arsenate of lead as applied in the second and third regular sprays will usually control the curculio.

PEAR SLUG (*Eriocampoides limacina*): This insect, as its name implies, attacks the pear, but is just as troublesome on the cherry. The adult is a small, glossy, black saw-fly about one-fifth inch long. Trees will often be observed in which the foliage presents a brownish appearance, and on their being closely examined, small, blackish, slug-like larvae will be found feeding on the upper surface of the leaves. There are two broods; the slugs of the first brood appear in June and early July, those of the latter late July up to the end of September.

*Means of Control*: Spray with arsenate of lead, 2 to 3 lbs. to forty gallons of water, whenever the slugs are numerous enough to warrant it, unless the cherries are beginning to ripen, applying the spray to the upper surface of the leaves. Dusting with hellebore, air slaked lime, or almost any finely divided dust, will also destroy most of the larvae, which are very readily killed.

APHIDS often cause considerable damage to young sweet cherry trees and also quite often to bearing trees by sucking the sap from the leaves and new twigs. They are usually observed attacking the new foliage at the tips of the limbs, causing the leaves to curl up. The common species is black in color.

*Means of Control*: Look for Aphids on the tips of the buds just before these burst, and if present, add Black Leaf 40 to the first spray, or use kerosene emulsion or whale oil soap alone. If not noticed in time add Black Leaf 40 to the regular application just after the fruit is set and spray thoroughly with force. If spraying is delayed the Aphids curl up the leaves and it is almost impossible to reach them then with the mixture.

SAN JOSE SCALE (*Aspidiotus perniciosus*) is of importance on the sweet cherries only, as the sours are practically immune from attack. For complete description of this insect and details of means of control see Bulletin 219 of the Ontario Department of Agriculture.

*Means of Control*: The first spray, the one applied just before the buds burst, is a most effective control. The spray, however, must be thoroughly and well done to insure good results, as indeed must all spraying.

There are various other insects which attack the cherry sometimes quite severely, but usually not so severely that they will not be controlled by the regular sprays as outlined below in the Spray Calendar. If the Shot-hole borer is abundant see that all dead wood is kept cut out of the trees and that no old wood piles, etc., are left. Burn all such wood before the end of May, and so destroy the breeding places of the insect. Increasing the vigor of the trees by fertilization will also help materially.

## THE CHIEF DISEASES OF THE CHERRY.

BROWN ROT (*Sclerotinia fructigena*) is the most serious disease affecting the cherry, causing much loss each year to sweet cherries particularly. One diseased cherry in a basket of the fruit is sufficient to spread the disease right through the

basket in time if conditions are favorable. On the tree also many bunches of the soft, brown, rotten fruit will often be observed. If allowed to hang on the tree, the diseased fruit will shrivel up, and dry and some of it will hang there all winter as "mummies" serving to carry the disease over till the following season.

*Means of Control*: Allow plenty of sunlight and a free circulation of air through the trees by judicious pruning, as the disease thrives in a close, humid atmosphere. Go through the orchard after the fruit is all harvested and pick or knock all diseased fruit from the trees and bury or plow under. The above precautionary measures, together with the regular sprayings, as outlined, will ordinarily keep this most destructive disease under control.

BLACK KNOT (*Plowrightia morbosa*): This disease, which causes rough black knots on the branches and sometimes on the trunks, is probably familiar to everyone and so needs no further description here. The fungus which causes the disease, works in the inner tissues of the limbs and cannot therefore be effectually controlled by spraying, though spraying helps by killing spores before they have a chance to grow into the tree.

*Means of Control*: *Cut out and burn* all diseased parts *in early winter, cutting far back into the healthy tissue* so as to make sure of getting all of the diseased part. It is important that the cutting out be done in early winter, so that it may be done before the black knot begins in March to throw off spores. If the main trunk is attacked the diseased part may be cut out, cutting well around into the healthy tissue and the wound painted over. If the attack is bad, however, it would be better to remove the tree. Burn all diseased parts cut out, also any dead and dying trees nearby. Spray as indicated below in the Spray Calendar.

SHOT-HOLE FUNGUS OR LEAF BLIGHT (*Cylindrosporium padi*): This disease produces brownish or reddish, circular, oval, or somewhat irregular spots on the leaves, these spots frequently drop out, giving a shot-hole effect and eventually causing the leaves to drop prematurely. Some seasons, cherry orchards in certain localities are almost defoliated.

*Means of Control*: The ordinary sprayings as given in the Spray Calendar will usually control the disease, but it is sometimes necessary to spray again as soon as the cherries have been picked. For such later sprayings use Bordeaux for Sweet Cherries to avoid danger of injury to the foliage.

POWDERY MILDEW (*Podosphaera oxyacanthae*): This fungus is usually most severe on young trees, attacking the leaves and the tender new shoots. It appears on the leaves in small white patches, which soon spread and run into each other, often finally covering the entire surface of the leaf. Later on many minute black spots, the fruit of the fungus, appear on this surface.

*Means of Control*: Spray with lime-sulphur about 1.008 specific gravity (commercial 1 gallon, diluted to about 40) as soon as the disease appears in sufficient abundance to justify an application.

SUNSCALD.—Dead areas on the south-west side of the trunk are often seen. These are known as *Sunscalds,* and are caused in spring chiefly in February and March by the sun heating up that part of the tree to a high temperature in the day and then the temperature quickly falls at night. This sudden great fall of temperature, especially when repeated a few times, kills the bark and causes the so-called Sunscald.

*Means of Control*: This can only be done by prevention. Wrap the trunk of the tree loosely around with ordinary building paper, or one or other of the materials

made for sunscald protection. Tie it securely at the top and bottom, and bank up earth at the base of the tree in addition. Low heading of young trees also helps greatly.

"GUMMOSIS" or a flow of gum from the wood often follows injuries of various kinds, such as from the work of insects and fungi, sunscald, orchard implements, etc.

*Remedy*: If the wound or diseased area is large, clean out the gum and dead bark with a knife and paint the place well with white lead free from turpentine. Small wounds seldom need any treatment.

### SPRAY CALENDAR FOR CHERRIES.

*First Spray*: In the spring, before the buds burst or even as they are on the point of bursting, use either the old home-boiled lime-sulphur or concentrated lime-sulphur, winter strength (specific gravity 1.030, or 1.035 for San José Scale. See Bulletin 198 of the Ontario Department of Agriculture or the Spray Calendar by L. Caesar). This spray will help to control the San José Scale, Brown Rot, Black Knot, and possibly the Shot-hole fungus.

*Second Spray*: Apply just after the fruit is set, using either the concentrated lime-sulphur, specific gravity 1.009, or Bordeaux mixture, with three pounds of arsenate of lead to forty gallons of water. If Aphids are troublesome, add Black Leaf 40 at strength recommended on cans to the lime-sulphur spray. This second spray is for the Curculio, in addition to helping in the control of the diseases mentioned for the first spray.

*Third Spray*: About two weeks after the second spray use the same material and strength as for the second spray.

A fourth spray just after the fruit is picked will sometimes be found necessary to control the Shot-hole fungus or Leaf Spot, as it is often called. Spraying to control the Cherry Fruit-Fly has been outlined above. See Bulletin 227 for fuller details.

*Note*: For sweet cherries it would perhaps be advisable to use Bordeaux mixture for all but the first spray, as sweet cherry foliage is quite tender and is liable to be burned by lime-sulphur spray.

For information as to how to make up the various sprays mentioned, see Bulletins 195 and 198 of the Ontario Department of Agriculture, or the Spray Calendar by L. Ceasar, which can be secured either from Prof. Caesar, Provincial Entomologist, Guelph, or the Fruit Branch, Department of Agriculture, Toronto.

### VARIETIES.

To the intending planter selection of varieties is a very important matter. A general recommendation as to what varieties to grow would be to plant those varieties which are succeeding best in that particular district with other growers, and which are most recommended by them. If it is desired to set out other or little known varieties, it would be wise to plant them in an experimental way only until they have proved their worth. Possibly fewer varieties of cherries have been commercially planted in Ontario than any other of our fruits.

Varieties of cultivated cherries are divided into three more or less well-defined groups, the Morello or Sour Cherries; the Bigarreau, Heart or Sweet Cherries; and the Duke varieties, which are intermediate between the other two groups, the fruit being usually sub-acid.

## Recommended Varieties and Descriptions.

Sours: *Early Richmond.*—This is our best early sour cherry on the market. It is a very prolific variety, a regular bearer and hardy, succeeding wherever cherries are grown in the Province. The tree, however, is inclined to be short-lived. The fruit is below medium in size, poor dessert quality, but first class for culinary purposes. It is inclined to be a little soft, and keeps only a short while after picking. It is, therefore, a poor shipping variety and should be disposed of in local markets. Season, early to mid-July.

*Montmorency.*—This variety seems to be the most profitable and therefore the most popular sour variety. The tree is one of the most vigorous in its class, hardy,

Montmorency.

very productive, and an early and regular bearer of fruit of excellent shipping and cooking qualities. It is a favorite cherry with the canning factories. It hangs on the tree well long after it is fit for picking, which helps very materially in extending its season so as to prevent a glut on the market at any time. Season mid-July.

*English Morello.*—Though not as popular as either the Richmond or the Montmorency, the English Morello should prove a very valuable variety for extending the cherry season well on to the middle of August. It is certainly deserving of wider cultivation in Ontario, having many other good qualities besides lateness of season to recommend it. Unfortunately the tree is a small, slow grower, and should, therefore, be planted closer than most of our common sour varieties. However, it is very productive and an early bearer, though possibly not as early as either the Richmond or Montmorency. The fruit is fairly large, dark red, attractive looking, much too acid for dessert purposes until very ripe, but for all culinary purposes

probably unsurpassed by any other variety. In flavor it becomes more and more sub-acid and agreeable the longer it matures. Like the Montmorency the fruit will hang on the tree, if necessary, in good condition for a considerable time after it is sufficiently mature to pick. The fruit is firm and an excellent shipper. Season, early August.

The three above described varieties, Richmond, Montmorency and English Morello, will cover the sour cherry season fairly well and will not overlap each other in season to any great extent, thus providing a *steady and economic* output with no *uneconomic* rush in the orchard at any one time. The season might possibly be lengthened to good advantage by including Dyehouse to come on just before the Richmond, but it is not as profitable a variety as the later ones. It precedes the Richmond by a very small margin only, and in addition the fruit is small in size. It is not as hardy as the Richmond.

If more or other varieties than the above described are desired, the Orel (Orel 25) and the Russian 207 or Russian Morello could very well be recommended. The *Orel* is one of the hardiest of the Morello or Sour Cherries, and is to be especially recommended for the more northern limits of cherry culture. Mr. Harold Jones, of Maitland, considers it the best all-round cherry yet tested for cold sections. The tree is rather a slow grower, but an early and abundant bearer of medium sized, good quality fruit for culinary purposes. Season, mid-July.

*Russian Morello* is a hardy, vigorous productive variety of Russian origin. It is a good cooking variety of ordinary quality and a fair market variety. Season, mid-July.

SWEETS: There is a wider choice of varieties in Sweets than in Sours and there are quite possibly other varieties than those recommended and described below, which are worthy of planting. The following varieties are recommended:

*White*: Napoleon, Yellow Spanish. *Black*: Tartarian, Elkhorn, Windsor and possibly Schmidtz' Bigarreau. A good proportion in which to plant the above varieties would be one of Tartarian, one of Napoleon, or Yellow Spanish (whichever preferred), two of Elkhorn and three of Windsor. It will be noted in this recommendation that the proportion of white varieties to dark or black varieties is one to six. Blacks ordinarily sell for 25c. per basket more than whites. Also blacks can be picked when less mature than whites, and they will still color up properly and sell well. White varieties, on the other hand, if picked immature, will never acquire that slight blush which adds so much to their appearance, but will lack brightness and finish and present a "dead" appearance by the time they reach the retailer. Furthermore, white varieties show the slightest bruises and rubs a very short time after picking. Do not pick white varieties, then, until they have acquired their characteristic blush and are full size, unless there is danger of losing considerable of the crop from brown rot induced by adverse weather conditions.

*Tartarian.*—This is one of the choicest of black cherries, whether for market or for dessert purposes for the home. The tree is not so vigorous as the other recommended sweet varieties, and hence not so productive. A Windsor will probably be bearing fifteen baskets when a Tartarian is bearing four or five. But while not so productive as some other varieties, it is a very regular bearer, and also makes up considerably for any lack of productiveness in the increased price that it brings on account of its early season and fine quality. The fruit is of large size and delicious flavor. An objection to the variety is that it is very subject to ravages of birds, probably because it is somewhat soft-fleshed. It is also subject to rot in wet

seasons, and on this account it is often necessary to harvest and ship it a little on the green side. Season, early July.

Napoleon or Royal Anne.

*Napoleon.*—Known as *Royal Anne* in the West. It is probably our most productive variety, yielding fruit of the largest size and good dessert quality, which is in good demand. It is, therefore, one of the most desirable varie-

ties from a commercial standpoint. Unfortunately, it has one very serious fault, it is very subject to the Brown Rot, especially in wet seasons, when the whole crop may be destroyed in orchards where proper means of control have not been taken. All sweet varieties seem to be about equally susceptible to rot, but some varieties, as the Napoleon, suffer more from the fact that the fruit hangs in large clusters. One rotten cherry will infect the whole bunch. As a canning cherry, the Napoleon is esteemed, as it bears cooking well and looks well in the jars.

*Spanish,* or *Yellow Spanish* as it is often called. This is one of the finest of the sweet varieties on account of its large size, beautiful waxy lustre and delicious flavor. The tree is very vigorous and grows to a very large size, possibly surpassing in this respect any other cultivated variety in Ontario. Like the Napoleon, it is subject to Brown Rot. It is an excellent cherry for dessert or culinary purposes, and in common with most sweet varieties finds a ready market. Season, early July, practically the same season as Napoleon, or a day or two later, so that only one or the other need be planted.

*Schmidtz' Bigarreau* or *Schmidtz.*—This variety has been recommended by some growers as being especially adapted to heavier soils, a point in its favor, as it increases the limits of successful sweet cherry culture. It is a very vigorous black cherry, bearing fruit of large size and splendid appearance, but the tree is usually complained of as not being sufficiently productive. Season, late July, about the same time as the Elkhorn, which on account of its greater productiveness should be planted in preference.

*Elkhorn.*—This variety is fast proving itself to be one of the most profitable market varieties. The vigor and productiveness of the tree make it a favorite with the grower. It is excellent for both dessert and market, being large, very meaty and firm, and standing up well under shipment. Season, late July, before Windsor.

*Windsor.*—The Windsor is the favorite dark cherry with many growers. Its late season, coming as it does after the Elkhorn is off the market, makes it especially desirable as it has no other variety to compete with it. The tree is not an early bearer, and the fruit is very subject to rot in some locations. However, its late season, productiveness and regularity of bearing, excellent dessert quality, its firm flesh, making it a better shipper than most dark-colored cherries, and the fact that it will succeed farther north than most Bigarreau or sweet cherries, all tend to make it one of our most valuable varieties.

*Governor Wood.*—As an early season cherry this variety has proved itself a fairly satisfactory cherry for both dessert and market purposes. It is very productive, and on that account the fruit quite often runs rather small in size, an undesirable feature from a market standpoint. It is, however, of good quality and altogether our best early market variety before Tartarian. One great objection to the Governor Wood is that it comes on the market during the strawberry season, late June, when pickers are scarce, and when also there is not the demand for cherries that there is after the strawberry crop is out of the way. It is then a conflicting crop, and as such crops are to be avoided the Governor Wood is not recommended.

Other sweet varieties might be recommended and described here, but the experience of the best growers in the Province has shown that the above varieties are the most profitable, and therefore the most important from a commercial standpoint. The Choisy, Eagle, Elton and many others, though recommended by some for home use, are not, either from lack of productiveness, poor shipping quality or some other serious fault, to be recommended for commercial planting. Also why

recommend them, as is often done, for home use when there are other varieties of as good quality, which are also regular productive bearers.

*Dukes.*—The Duke varieties that succeed in Ontario seem to have one fault in common: the trees have green and ripe fruit on them at the same time, which makes them undesirable for commercial orcharding, necessitating, as it does, several pickings instead of one, and so materially increasing the cost of harvesting. The *May Duke* is a fine cooking cherry and very productive, but is rather tender for distant shipments and is inclined to rot in wet seasons. The *Late Duke* is also a most desirable cooking cherry, and is very productive. Its season, which is between that of Early Richmond and Montmorency, also makes it a desirable variety. The Late Duke, and the May Duke which precedes it about two weeks, cover the early part of the season for cooking purposes, while two sour varieties, the Montmorency and English Morello, extend the season for cooking berries into early August.

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## SPECIAL ARTICLES BY PRAC. AL CHERRY GROWERS.

With a view to making this bulletin as practical as possible, and so increasing its value to cherry growers, the writer corresponded with three of Ontario's most up-to-date growers with the object of securing from each of them a special article outlining in brief his particular methods of Cherry Culture. The articles follow, and the author would like to take this opportunity of expressing his sincere thanks and appreciation to the writers, Mr. G. A. Robertson, St. Catharines, Mr. Howard Leavens, Bloomfield, Prince Edward County, and Mr. P. E. Angle, Simcoe, who most willingly replied in response to the above request.

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## CHERRY CULTURE.

G. A. Robertson, St. Catharines.

The sweet cherry, though planted here and there over many parts of old Ontario, is not very extensively cultivated, and of all the tree fruits has been given less attention than the crop warrants. With proper care it can be grown in many places, but I shall confine my attention to the cultivation of this fruit as grown in the Niagara district.

It thrives best in close proximity to a large body of water, on high exposed situations, on soil which is fairly deep and the sub-soil free of excess water, as the sweet cherry seems to demand "dry feet" above all the tree fruits, and will not thrive on soils where peaches may be fairly successfully grown. Therefore, before planting, it is safer to underdrain the land even although it may be considered dry, although there are a few exceptional gravelly ridges which are suitable without draining.

The sweet cherry is one of the first trees to blossom in the spring, following closely the apricot, which is the first, and usually the sweet cherry petals are all fallen to the ground when the sour varieties are in full bloom, hence we sometimes during a spell of warm weather, have the trees in full bloom as early as the 23rd of April. If a cold spell comes then or shortly after the petals have fallen, district

away from the influence of water will often suffer severely from freezing of the blossoms, while orchards close to the water will come through all right, partly on account of the modifying effect of the water, and also because the blossoming period has been delayed by the cooling influence of the water.

In taking up the management of any orchard, to obtain success means to overcome difficulties, so when I say that the sweet cherry is usually the most neglected of the tree fruits, I could put it another way and say that the difficulties of handling the sweet cherry crop during average or adverse weather conditions make it a serious problem, and therefore few have seen fit to attempt and less to continue it.

The most serious difficulty in the growing of sweet cherries is the Brown Rot. Although in such exceptional season as 1911, when weather conditions were ideal and no rot developed, we are not troubled with the rot, still it often happens that during June and the forepart of July we have alternate rain and hot sunshine, and during such weather it is only by continuous vigilance and proper methods we can attempt to successfully harvest many of our best varieties. It is advisable, therefore, to avoid conflicting crops, such as late strawberries, as the cherry crop then is likely to require all the labor and attention available.

Plant your orchard as near as possible to a town or some good shipping station, where you may get a sufficient quantity of pickers and also have good shipping facilities. From the varieties I have tested at one time and another in my orchard. I would recommend planting Richmond, Black Tartarian, Napoleon, Elkhorn and Windsor, and end with Montmorency, as these varieties are annual bearers, prolific, and cover the season well. I like to have some sour varieties as, on account of the comparative ease of handling, we put the pickers at them when the sweets cannot be handled, keeping the pickers steadily employed.

Usually considerable difficulty is experienced in getting varieties true to name from the nurseries. At present I am limiting my planting to where I can get a nurseryman to take the buds I give him, and bud them on Mazzard roots. I get them for planting the end of October of the following season and plant them direct into the orchard.

Fall planting of yearling sweet trees on proper soil has eliminated the high percentage of failure. Formerly we planted in the spring; often the trees were dug up the previous fall and carelessly wintered, perhaps the roots were dried out and the trees came to hand with the buds swelled, or rubbed off on one side, making it difficult to head properly even if they did live. After the nursery stock stops growing in the fall, and the wood ripens and the leaves drop, we plant, carefully plough up to the trees and protect them from mice. In the spring we plough away, cultivate and straighten the trees to perpendicular, hoe around them and keep them mulched by loose earth on top, cut the tree to the desired height after the buds start, leaving six or eight of the buds to make a head, and when these grow and get well established we make an even fork of the three best. In after pruning I do not shorten in the previous season's growth at all, unless one of the branches grows up at the expense of the others and puts the tree out of balance. The branches which are desired to spread the tree in the proper shape are left, removing the branches which grow to make the centre too dense and the others which tend to cross with branches from the other forks. This is repeated year after year. When the trees tend to grow too high and on account of heavy manuring and winter pruning make excessive wood of an upright growth, which makes the tree too thick, the top of the inner branches may be removed. If this cutting is done early in July and cut close to the junction of another limb, the new-forming bark will cover sometimes one-

half the size of the wound before fall, and in a year or two completely cover the wound. Pruning at this time there is not the same tendency for the tree to form a bunch of suckers at the wound, as often happens if winter pruning is followed, but rather there is a tendency to the formation of fruit buds.

In manuring the orchard in full bearing I am following the practice of giving the orchard an application of about 15 tons of stable manure every winter spread

In the sweet cherry orchard of Mr. G. A. Robertson, St. Catharines. Note the open centre in the trees.

broadcast, then 400 lbs. of bone meal and 200 lbs. of muriate of potash per acre. For annual crops you must manure heavily.

Plough from the trees as soon as possible in the spring, hoe around the trees and work down and cultivate at least once a week both ways. When harvesting is

over, we immediately plough up to the trees, harrow down lightly and seed down with common red clover, hairy vetch or rape or any other desired cover crop, open water furrows and leave. If the big weeds come up very quickly, and we wish to keep them down we use a mower just as they start to form seed.

Now as to spraying: The first spraying is to thoroughly drench the trees, sour and sweet, from both sides with lime-sulphur, winter strength, not allowing even a fraction of an inch of the bark above the ground to be missed. We do this by spraying one side with the wind, then waiting until the wind blows in the opposite direction and spraying the opposite side. This is done safely even when the buds burst and the blossoms show white and are almost ready to burst. The next spray is summer strength lime-sulphur and 2½ to 3 pounds of arsenate of lead to 40 gallons of water and followed ten days or two weeks later by another similar spray.

In harvesting use 6 to 10 foot ladders of the improved wooden type, three-legged and well braced. Ladders that have to be leaned against the tree are very objectionable, as they rub off innumerable fruit spurs and break many small branches. In picking grasp the fruit by the stem and twist from the fruit spur, being careful to leave the fruit spur on the tree from the production of succeeding crops.

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## SOUR CHERRY CULTURE.

HOWARD LEAVENS, BLOOMFIELD.

Our experience in growing sour cherries commercially has been to plant such varieties, at least three, as will extend the season over a long period, thus taking less help to pick and handle the crop. It also gives a longer season for marketing, and this is an advantage where shipping to retailers. For instance, when one retailer can handle 50 baskets a week, if you had only one variety probably three weeks would be the limit, and he would, therefore, take only 150 baskets; while by having more varieties, one following the other, the season can be extended over six to eight weeks, and the buyers can handle more fruit.

We have found that the Early Richmond, Montmorency, and English Morello, ripening in the order named, are the most satisfactory varieties. We have tried Olivets, which are a fine, large cherry and a splendid seller, but not a regular bearer, and the tree is not as hardy with us as the others mentioned. There are several other varieties that I might mention, but they have not proved successful with us.

We have also found that cherries do better planted on a limestone soil and on fairly high ground, in fact some of the highest gravelly knolls have produced the best bearing trees and the finest fruit. The trees planted on such soil do not grow as large as on heavier soil, but the fruit is firmer and will stand shipment better, also the trees are longer lived.

We set our trees 20 ft. by 20 ft., but the English Morellos could be set closer, as they are not as large trees. When setting the trees we use a marker similar to that used for marking out corn ground, using only two runners, 10 feet apart. When the ground is marked both ways we set stakes in every other cross mark in every other row, and it gives an accurate setting if the holes are dug where stakes are set. We trim the roots back before setting, but do not trim the tops until later, as time is at more of a premium then than later. We have set trees in the fall and find it preferable to spring planting, for the reason that the trees are in the ground and

ready to grow as soon as spring opens. Sometimes also there is difficulty in getting trees in spring from the nursery in time to set when the ground is ready, or in a backward spring they may arrive too early and have to be held until conditions are favorable for planting.

Our experience has been to leave the trimming of fall planted trees until the following spring or summer, because in some of the more growthy or sappy trees some branches will freeze or die back, and these cannot be detected in the winter. In the following summer these branches may be taken out and the tree shaped into the form desired, favoring low-headed trees on account of ease in picking and trimming. We find it cheaper to use low, wide machinery for cultivation than to pay for picking and pruning high trees. We thinned one block of four-year old trees

A general view of the "Leavens Orchards" at Bloomfield, Prince Edward County. Mr. Leavens has 2,500 bearing sour cherry trees and 1,000 one-year-planted trees.

rather heavily and tipped back the previous season's growth in winter 1913-14, and found in comparing these trees with some that were not trimmed that they had a very heavy set of buds where the others were only partially loaded We have had no bad results from trimming in the winter, or in fact at any time of year. With us it has been a case of trim when the time could best be spared, and that is in the winter and spring, starting the latter part of January. We do our heaviest pruning on the young trees; then as they grow larger there are less large limbs to be taken out and the trees grow nearer the desired form.

The newly set trees are mulched the first winter with manure which is worked away from them in the following spring when cultivating and working around them. A hoe crop is planted among the trees, and they are cultivated along with the crop

that season and the ground kept clean. A crop that can be cultivated is planted among the trees for about four years, thus getting some return from the land and keeping trees well cultivated. Strawberries, beans, potatoes, tomatoes, and corn are all crops that work in well with the orchard; but it is better to manure the land while growing these crops, as they take a good deal of nutriment out which should be replaced as the trees get older and the root system spreads. When the orchard is four to six years old we give it clean cultivation, sowing no crop except a cover crop late in summer which is ploughed down in the fall. We have fall ploughed, throwing the furrow up to the trees, for several seasons, and although the practice is not recommended we have not noticed any bad results by following it, and it relieves the pressure of spring work.

In the spring, as soon as the land is fit to drive on, we give the trees a dormant spray of lime-sulphur, and then give them another spray of a weaker solution of lime-sulphur, combined with about 3 pounds arsenate of lead to 40 gallons of water, either just before the blossoms burst or after they have fallen. Then when the cherries are formed, and before they start to color, we spray again with the lime-sulphur and arsenate of lead solution. This last spraying should not be left too late, as sometimes the lead will leave a discoloration on the fruit when picked if a rain has not washed the spray off in the meantime. We have used the Bordeaux mixture on cherry trees, but do not think that the extra time in preparing it justifies its use ahead of the lime-sulphur.

When harvesting the cherries, especially if the trees are very heavily loaded, we pick some trees twice, because it gives the fruit that is left a better chance to color, and it is surprising the growth it will make in a few days after thinning. A great proportion of fruit is picked too soon, which makes an inferior quality as well as not giving the quantity that otherwise would be obtained by waiting a few days. We have shipped cherries that were ripe to a town a distance of one hundred miles, and had them returned on account of a wrong address. These cherries were re-addressed and sent back, and we were informed that they arrived in good condition, despite the three trips, and several handlings they received during transit. We have also shipped small quantities of cherries put up in quart berry boxes, and these packed in forty-eight carrier crates, as far as Indian Head, Sask., and had them arrive in good condition. These cherries had not been cooled, and were shipped by express as if just going to Toronto.

Our cherries have all been picked by women, and each picker has a number which she marks on each basket that she picks. The baskets are taken to a packing shed as fast as they are picked, and there they are looked over and each basket has the top layer of cherries turned down so that there are no stems showing. This gives a much better appearance to the fruit and in doing this any inferior fruit is taken out. A small bright red label with our address is pasted on the ends of each basket, which is our guarantee that the fruit is good. The facing of the cherries and attaching the label takes some time, but three or four cents per basket will cover this, and we think it pays well to follow this practice. The women will pick from ten to eighteen baskets per day, according to the size of the tree and quantity of fruit on each tree. Each picker is given a ticket which is punched each time a basket is filled and taken from her, and by having her number on each basket we know who is doing the cleanest picking and where to look for any carelessness.

It is hard to estimate the yield of trees, as they vary according to age and the season. We have had trees ten years old yield as high as twenty-six eleven-quart baskets, while others near these, and apparently as thrifty, would not give over

one-half that quantity. An orchard of one thousand trees of four years setting produced on an average one-half a basket per tree. This is not a large yield, but it should be doubled in two years more with proper care of the orchard.

Our cherries are practically all shipped to retail grocers and private customers. In the cherry season a trip is made calling on the most of the customers and orders are taken for the number of baskets they think they can handle. The cherries are then shipped to them, so many baskets a day, some taking one-half dozen and others up to twenty-five. Days that we pick more than we have orders for we send to a reliable commission house, but this does not happen often, as cherries can be held a day or two if kept in a cold place, and by that time they can be placed. We have found it very satisfactory to sell our own fruit, as we know what we are getting for it, and there is no commission to pay.

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## SOUR CHERRY CULTURE.

P. E. Angle, Superintendent Lynndale Farms, Simcoe.

With respect to cherry culture, I may say that I do not profess to be an expert cherry grower. Our cherry orchards comprise only a very small part of our plantation. Out of 400 acres of orchard we have only about nine acres of cherries all told, and six acres of these are not yet bearing. I am, however, handling our cherry orchards to the best of my ability, and will give you our practice and the actual results regarding cost and returns from the

The orchard to which I refer contains a [illegible] than 2¾ acres of land, with 280 trees seven years old last spring. They ha[illegible]hree consecutive crops, 1912, 1913 and 1914. The crops of 1912 and 1913 were injured by early spring frosts, and as you will see by my statement gave only a very moderate yield. The crop of 1914 escaped the frost almost entirely, and we had a fairly good year. I had no records for the 1912 crop, but will give you an exact record of the cost of production and the returns from the fruit of this orchard for 1913 and 1914 respectively.

### COST OF PRODUCTION, 1913.

2¾ acres, Montmorency Cherries, 280 trees, 6 years old.—Orchard valued at $800.

| | Cost. | Receipts. |
|---|---|---|
| Interest on money investe[illegible] six per cent | $48 00 | |
| Taxes | 8 80 | |
| Telegrams | 1 83 | |
| Picking | 61 51 | |
| Labor, men, including spraying | 32 47 | |
| Labor, cultivating | 15 00 | |
| Spray Material | 10 00 | |
| Cost of Management | 20 00 | |
| | $197 11 | |
| Total receipts | | $198 62 |
| Net profit | $1 51 | |

*Note.*—Cherries sold at canning factory, no baskets required. No fertilizer applied.

## COST OF PRODUCTION, 1914.

2¾ acres, Montmorency Cherries, 280 trees, 7 years old.—Orchard valued at $900.

| | Cost. | Receipts. |
|---|---|---|
| Interest on money invested at 6 per cent. | $54 00 | |
| Taxes | 9 90 | |
| Cultivating during the season | 34 78 | |
| Pruning | 41 59 | |
| Spraying: labor, men, $1.70; horses, $2.32; spray material, $12.88 | 16 90 | |
| Fertilizing, 47 tons manure | 80 00 | |
| Picking and Packing | 233 79 | |
| Packages, 11-quart baskets | 56 25 | |
| Delivering to shipping point—labor: men, $2.70; horses, $3.49 | 6 19 | |
| Cost of Management | 20 00 | |
| Total | $553 40 | |
| 1,246 11-quart baskets, cherries | | $729 90 |
| Net profit | $176 50 | |

These records, with the exception of cost of management, taxes, and interest on money invested, are actual costs, made up from our time records, which we keep in minute detail, together with the cost of packages and spray material, etc. The receipts do not include any expenses for selling or shipping. I have deducted commission and express from the receipts, so that our receipts represent the total received, net, at Simcoe.

You will notice a considerable difference in the two statements as to cost of cultivation during the season. This is due partly to the fact that in 1913 the orchard had a heavy cover crop on from the previous year, and was not ploughed until after cherries were harvested, which kept down our cultivating expenses. In 1913 we did no pruning whatever.

You will notice that our item of expense for delivery to shipping point is very small. This is due partly to the fact that we are close to the station, and partly to the fact that we were drawing strawberries to market practically all the time we were drawing cherries, and the same trips answered for both.

You will notice we have charged the labor of men and the labor of horses separately; this is because we have worked out the actual cost of our horse labor, and having kept a record of the amount of horse labor spent on various crops, we charge it up against those crops at this rate, which is 11.64c. per hour.

Cultural Methods.—The cultural methods followed with the cherry are entirely different from those followed with the apple. The cherry tree begins to draw on the soil to produce the crop very early in the spring, and very rapidly, and consequently must have early spring cultivation, which needs to be kept up almost until harvesting time in order to conserve moisture and to push a heavy crop to full maturity. For a time, just before and during harvesting, however, we have to stop cultivation for a period of some two, or perhaps three, weeks, and with an apple orchard this is the time we would sow our cover crop, but with cherries, if we are to get another crop again the next season, this is the time when the trees must collect food material and force buds for the next year's crop, and it is not advisable to stop cultivation. As a matter of fact, we usually plough shallow away from the trees just after the crop is harvested, and once in three years put on it a heavy coat of manure, previous to the ploughing, and cultivate at least once a week almost the whole rest of the season. Towards the first of September, when rains are coming more frequently, we cease the frequent cultivation, and late in the fall plough again to the trees and leave the orchard in this condition over winter ready for the

early spring cultivation. If we miss a crop, we usually sow a cover crop about the first of August, and fall plough late the same fall, but we do not figure on the regular cover crop as we do with apples. As I have mentioned previously, I have tried it, and do not like it.

PRUNING.—Many people contend that cherries do not need pruning, but we prune them regularly, but lightly. In some cases we even cut them back, but not often, the main object of pruning being to avoid trees getting too thick, cutting out cross limbs and branches that are damaged and bruised, etc.

SPRAYING.—The spraying of cherries is an essential and, I think, often neglected part of cherry culture. We spray entirely with lime-sulphur, using arsenate of lead for poison to kill the curculio. Where some seasons we have been rushed for time and have neglected one of the sprayings, and in one case neglected both sprayings for the season, I found that along with other troubles of dirty fruit, we were always troubled with the shot-hole fungus, and sometimes to such an extent that the trees would be completely defoliated in August. This, of course, does not give much of a chance for a crop of cherries the next year. We spray with concentrated lime-sulphur, testing 32 degrees Baume, mixed one gallon of lime-sulphur to nine gallons of water, early in the season before the buds start, and we give a second spraying after the cherry is formed and as soon as possible after the calyx drops, with a mixture of commercial lime-sulphur, mixed one gallon of lime-sulphur to twenty-seven gallons of water and in both sprayings we drench the trees thoroughly. Both mixtures, too, are of the maximum strength, being much stronger than lime-sulphur is usually applied. I have found, however, no injurious results to the foliage, and I believe that the successful use of lime-sulphur depends on getting it on the trees in as concentrated a form as possible, without injury to the foliage, for in cases where I have used it weak I have gotten poor results. By spraying, however, as outlined above, we are able to produce cherries which are 99 per cent. perfect, and this is the goal we are after. We have not as yet been troubled with the Cherry Fruit Fly.

SELLING.—The selling of cherries in these times is a difficult matter, and with poor fruit it is almost an impossibility. We always pick our cherries with stems on, as when picked with stems off they will not stand for any length of time and are mussy and unattractive even from the first. We market in 11-quart, 6-quart, and 1-quart baskets to suit the trade, and we sell wherever we can, including local trade, local canning factories, Toronto, London, Woodstock and Stratford. We have, however, found difficulty in delivering small express shipments in good order. They are roughly handled by the express company, and usually present a sorry appearance when they arrive at their destination, which puts us at a great disadvantage.

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