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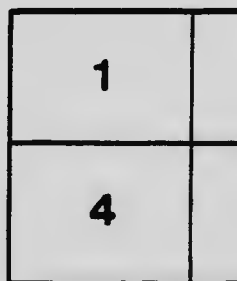
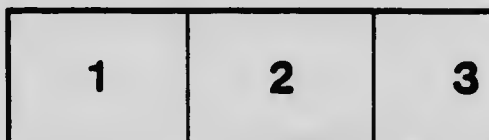
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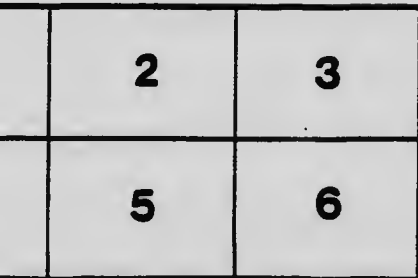
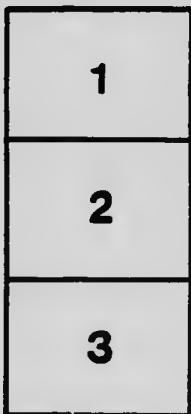
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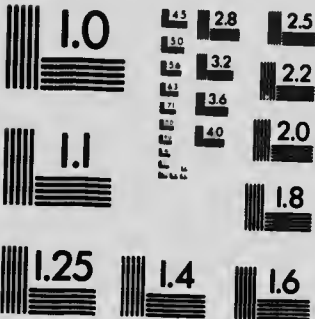
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PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE (HORTICULTURAL BRANCH).

PLANTING PLANS AND DISTANCES.

By M. S. MIDDLETON, B.S.A., ASSISTANT HORTICULTURIST.

PLANTING PLANS.

COMMERCIAL orchards are staked out and planted according to one of four systems, viz.:—

- (1.) Square;
- (2.) Quincunx;
- (3.) Rectangular; or
- (4.) Hexagonal.

Where fillers are used in the main orchard planted according to the square system, they can be placed either in the centre of each four trees, thus giving the quincunx system, or they can be placed in the rows one way, making the rectangular system. The double fillers are occasionally used, and in this system the fillers are placed in the rows running in both directions. Fillers are seldom used to make the hexagonal system. In an orchard planted according to the latter system, one tree will be found in the centre of six, this tree being equidistant from each of the others. In other words, any tree in the orchard will be equidistant from the six surrounding it, which are also equal distances apart.

The square system has its advantages, in that it leaves an equal space for cultivation both ways. It can also be intercropped to advantage. Fillers can be used with the square system to better advantage than with either of the others. By planting a filler in the centre of each four permanent trees, thus making the quincunx system, the fillers can be left for many years to bear profitable crops. It also leaves a fair space for intercropping, especially where the main orchard trees are planted 30 feet apart. Where the fillers are placed in the rows, a much larger space is left for intercrops, but the fillers cannot remain as long as in the previously-stated case. It also allows plenty of room for irrigating, spraying, harvesting, etc., and the writer believes it to be possibly the best system for general planting.

The hexagonal system is used principally with short-lived trees, such as peaches, and where no fillers are to be planted. Its chief advantage lies in that more trees, the planting distance being the same in all cases, can be planted to the acre than with any of the other systems. Some growers claim that by the use of this system the ground is more thoroughly ramified by

roots, but this is not the case, as the roots of trees planted on the square system will touch long before the tops are together. As an orchard planted on this system becomes old, difficulty is met with in driving through for cultivation, spraying, and harvesting purposes.

The following is a table showing the distances recommended for planting in British Columbia:—

Approved Distances.	Feet.	Feet.
Apples, standard .....	30 x 30 down to	21 x 21
Dwarf apples, dwarf pears or quinces	10 x 12 down to	6 x 8
Pears or sweet cherries .....	25 x 25 down to	18 x 18
Plums or sour cherries, peaches, etc.,	22 x 22 down to	16 x 16
Grapes .....	15 x 10 down to	8 x 8
Currants and gooseberries .....	4 x 5 down to	3 x 4
Raspberries, blackberries .....	4 x 7 down to	3 x 6
Strawberries .....	3 x 4 down to	2 x 4

Table	Number of Trees per Acre.	Square.	Hexagonal.
2 x 3 feet .....	7,200	...	...
2 x 4 ..	5,445	...	...
3 x 5 ..	2,904	...	...
4 x 4 ..	2,722	3,130	...
4 x 5 ..	2,178	...	...
4 x 6 ..	1,815	...	...
6 x 8 ..	907	...	...
8 x 8 ..	680	782	...
10 x 10 ..	435	500	...
16 x 16 ..	170	195	...
18 x 18 ..	134	154	...
20 x 20 ..	109	125	...
22 x 22 ..	90	103	...
25 x 25 ..	69	79	...
30 x 30 ..	48	55	...

For any distance not given in the above table, multiply the distances in feet, and divide the total into the number of square feet in an acre (43,560). This will give the number of trees planted when using the square system. To find the number for the hexagonal system, add 1 to the number obtained by the above calculation. To calculate the number of trees planted per acre when using the quinque and rectangular systems, double the number planted by the square system, which will give you the approximate number.

The various distances for the planting of fruit-trees must be worked out by the grower himself, as it will vary with the variety planted, the soil, climate, etc. For example, with the square system, 21 feet would give space enough for an orchard of Wageners, Jonathans, Duchess, Wealthy, etc.; whereas for Gravensteins, Spys, Kings, etc., it would be rather close, and 30 feet would be a better distance. When the filler is used, the standard trees, that is, those trees that are intended as permanent trees, are planted probably about 30 by 30 feet.

Where it is the intention of the grower to use intercrops, it would be advisable to plant the fillers in the rows one way only. For example, if the main orchard is planted 30 by 30, after the fillers were planted the orchard

plant would show tree distances of 30 by 15. This distance would be sufficient to allow the filler to bear for a number of years, providing it was an early and heavy bearing variety.

#### FILLERS.

There is a difference of opinion among growers as to the advisability of using fillers. Their main argument against them is that there is a danger of leaving them too long, and thus doing permanent injury to the standard trees. This is a problem which depends largely on the orchardist himself for an answer, for, if he believes that he will not remove the fillers soon enough, he had better not plant them. A competent orchardist would remove the fillers before they encroached on or did damage to the main orchard. The proper time for their removal is easily ascertained by the growth of trees and the grade of fruit being produced. If the standard trees are producing a poorer grade of fruit each year, even under the same careful attention to cultural operations, the grower can, generally speaking, look to his fillers for the remedy. There is no reason why they should not be profitable, where the soils are rich and deep and plenty of water is available, providing a proper system of cultivation and pruning is practised. Many growers have met all running expenses, and in some cases paid for their land, from the fruit produced by the fillers during the early years of the orchard.

#### MIXED PLANTING.

It is not a good practice to plant stone-fruits with apples and pears. Stone-fruits may be mixed together, likewise the pome fruits, as orchards are always most successful and profitable when the same kinds of fruits are planted as standards and fillers. Stone-fruits require more early and less late cultivation than is practised with pears and apples. On this account, if we cultivate and irrigate to suit the stone-fruits, it would not suit the apples and pears, and vice versa.

#### LAYING OUT AN ORCHARD.

It is expected in planting out an orchard, especially of apples, pears or cherries, that it will remain for twenty-five years or longer, so that it is desirable from the standpoint of appearance, and also for convenience for cultural operations, to have it laid out in straight lines. It is a simple matter to lay an orchard out in this manner, providing a proper start is made.

#### HOW TO FORM A RIGHT ANGLE.

Select first your best base-line. It might be a boundary fence, road, or ditch. To form a right angle from this base-line, proceed as follows:—

With the use of a measuring tape, line, or wire (any line that will not stretch will do), measure off from the point (*a*) from which you are starting the right angle, a distance of 75 feet along the base-line to a point (*b*). Place a stake at both these points. Next take 100 feet of line, placing one end at each stake (*a*) and (*b*), and draw out the line at the centre tight (50 feet from each end) towards the field, and mark this line with a stake (*c*). Leaving the line as it was at stakes (*b*) and (*c*), take the end at (*a*) and stretch it in a line with (*b*) and (*c*), and mark the point with a stake, calling it (*d*). A line drawn from (*d*) to (*a*) will be the right angle on the base-line. There are several other methods of obtaining a right angle, among which is the use of the common T-square, and a right angle is obtained with this instru-



ment by sighting along it in both directions and staking accordingly. After the base-line is obtained and the right angle formed, a parallel line to the base-line can be run off at the opposite side of the field, or at least a distance away to suit the length of the measuring-wire, after which the field can be laid off in blocks. If the area to be planted is large, it would be advisable to secure the services of an engineer to at least lay out the base-line.

#### SIGHTING METHOD.

An orchard can be set out much more quickly and fairly accurately by this method, provided the men who dig the tree-holes and set the trees have good eyesight and use a little care. This is done by running out a row of laths or stakes, the distance apart at which you intend to set your trees, placing them across the ends and sides of your field, and a row across the centre of the field each way. By this method you have two stakes to sight from in both directions, and by setting the tree at the intersections you are able to set them in straight rows. It is advisable to dip your stakes or laths in whitewash to make them more easily seen. It might be advisable in some cases to first drive a small peg where each tree is to be planted, as it is easier to change a misplaced stake than a tree.

#### STAKING OUT THE ORCHARD.

To stake out, obtain a wire (twisted clothes-line wire is the best) about 300 or 400 feet in length, and upon this wire mark by means of coloured tape the desired distances at which you intend to plant the trees. Mark your distances when the wire is well stretched. The wire is stretched by means of two large iron rings fastened to each end, through which crowbars are passed by a man at each end of the wire. A field can be quite quickly and accurately laid out by this means, especially if the field is fairly level. (If the field is rolling or hilly, a short line or measuring-pole and a plumb-bob is used.) By running a line parallel to the established base-line at a distance away equal to the length of your measuring-wire, and marking on it the distance apart the rows are to be planted, this block can be laid off by means of the measured wire, and so on until the whole field is staked.

In placing the stakes according to the hexagonal plan, use three  $2\frac{1}{2}$ -inch iron rings and three pieces of small-gauge wire, the desired length to correspond to the distance apart you wish to set your trees. Fasten these wires to the rings, so as to form an equilateral triangle. By passing two of the rings over the first two stakes in the staked base-line, and pulling the third ring outwards towards the field until the wires are tight, the position of the first tree in the second row is located. Then by changing the rings to the second and third stakes the position of the second tree in the second row is located, and so on until the whole field is staked.

#### PLANTING-BOARD.

By the use of a planting-board you are able to set the trees in the same positions as the stakes. A very convenient planting-board can be made very quickly out of 1-inch lumber  $3\frac{1}{2}$  inches wide. Cut one piece about 4 feet long, and at about 2 inches from each end of this piece bore a hole 1 inch in diameter. Cut the second piece about 18 inches long, and cut a V-shaped notch or a half-circle at one of the ends, then by the use of a tee (T) hinge fasten this short piece to the centre of the long piece and the planting-board is finished. The

board is a very handy planting-board, as the short piece on the hinge can be thrown back out of the way, after you have made the board fast by placing pegs through the holes in the long piece, and it allows plenty of space for digging the hole and for planting the tree. The short piece may be thrown back again at any time to make sure whether the hole or tree is in the right position.

*Victoria, B.C., December, 1912.*

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