

P 181

WEST VIRGINIA

DEPARTMENT OF AGRICULTURE

CHARLESTON

Published by the State Department of Agriculture

Written by Arthur A. Gold

**Horticultural Possibilities in
West Virginia Among
Mining and Man-
ufacturing
Plants**



J. H. STEWART, Commissioner

DECEMBER, 1920

WEST VIRGINIA

DEPARTMENT OF AGRICULTURE

STATION

1911

1911

Horizontal Possibilities in

West Virginia



TRIBUNE PRINTING CO., CHARLESTON, W. VA.

Planting

Plans

GENERAL OUTLINE

The Department of Agriculture is entering upon a campaign of promoting and encouraging the establishment of fruit gardens, home orchards and general improvements in ornamental and shade trees throughout the State. Activities along this line will be operated in the various mining towns and manufacturing districts, about churches, schools and county property and public resorts.

This work will be done in connection with the assistance now being given in the matter of aiding the production of vegetable gardens, community canning plants and other similar agricultural developments. Officials of coal companies and manufacturing plants and other industrial corporations and influential laborers are invited to assist in this work for general mutual improvements to the companies, the men and the State. Professional men, such as doctors, lawyers, ministers and school teachers; State officials, County officials, District Superintendents and District Boards of Education, merchants and such individuals who from their position and sentiment will assist, are requested to aid in promoting this general improvement.

Expert advice and assistance will be given by the Department of Agriculture relative to the planting of fruit trees, vines and shrubs. The selection of the best soil suitable for growing the various trees should be carefully studied. A gravelly clay loam with a gravelly clay sub-soil is best for apples and is suitable for all fruit trees, vines and plants generally, as well as nut bearing trees. The soil should be fertile and deep. Extremely low altitudes where air drainage is not sufficient are not recommended as a suitable place for planting peaches, Japanese plums, sweet cherries and other late blooming fruits on account of the danger from late spring frosts. The same is also true of extremely high altitude. However, good crops may come from either extremely low or extremely high altitude, but considerable uncertainty will hinder to a more or less extent the profitableness of planting in extreme exposures. Air drainage is indispensable to a good fruit crop and it would be well to locate orchards at such places as have natural openings, drainways or air passage ways between mountains, along streams and like

places. Avoid the location of orchards in basins where the hills surround it from all sides, leaving no drainway for air.

These general instructions if carefully followed, will materially aid in promoting successful crops, from the orchards. Detailed instructions should be read and carefully studied both as to location and care of orchards and assistance in this study will be given by the Department from time to time and as the needs may require.

TREE FRUITS

APPLES—There are many varieties of apples a great many of which are now being profitably grown in West Virginia. Following is a list of varieties which will give fruit throughout summer, fall and winter seasons, commencing with the earliest and ending with the commercial winter varieties: Yellow transparent, Early Harvest, Shenango Strawberry, Golden Sweet, Gravenstein, Summer Rambo, Wealthy, Maidens Blush, Duchess, English and Fall Rambo, Northern Spy, Baldwin, Jonathan and Grimes Golden.

The standard varieties for home consumption as well as for commercial purposes should consist of about the following: Rome Beauty, Stayman Wine-sap, Virginia Winesap, Delicious, York Imperial and Ben Davis. The Jonathan and Grimes Golden are varieties of extremely high quality and considered a part of the commercial varieties in as much as they will keep in storage until about January 1st.

PEACHES—By using the proper varieties, commencing with the earliest, ripe peaches may be had throughout the season. The extremely early varieties, however, are not as good quality as the fruit ripening later. Following is a list of the varieties largely used for home consumption as well as for commercial purposes, given in order of their ripening: Carman, Bell of Georgia, Chmapioh, Elberta, Stump, Crawford Late, Fox Seedling, Stephens Rare Ripe, Beers Smock, Wonderful, Heath Cling, Salway, Krummel October, Bilyeus Late. Planted in this order will give a continuous ripening of fruit from about July 15th to October 15th.

CHERRIES—If sour cherries are desired, Early Richmond and Montmerency are the best to plant. The Montmerency commences to ripen as early as Richmond is finishing up. The late Duke is a medi-



Grow More Apples

um sour cherry ripening even later than the Montmerency, and is a large cherry and very prolific. For Sweet Cherries, such varieties as Governor Wood, Yellow Spanish, Rock Port, and Black Tartarian are in all probability the most profitable to plant.

PLUMS—Some of the European Group such as Yellow Gage, Lombard, Moores Arctic, Shrops Damsen are excellent and are preferred for several reasons—the principal ones are productiveness, late blooming, and immunity from Black Knot, a fungus disease which has proved to be very destructive to plums and sour cherries throughout the southern part of the State. Such varieties of plums as Abundance, Red June, Satsuma and a few more of this class belong to the Japanese group and should not be planted as extensively. They bloom early and are more apt to be killed by late spring frosts.

QUINCES—Such varieties as Orange, Meeches and Champion are preferred because of quality, productiveness, and general adaptability.

PEARS—The planting of pears on a large scale, or even in or about the home apple orchard should be discouraged for several reasons. Most varieties of pears that would be productive in West Virginia bring forth their blossom buds too early and in most localities are killed by spring frosts. This is also the host plant for the *Bacillus Amylovorus* which is responsible for Fire Blight on apples, pears, quinces. The disease winters over in the pears after which it develops and is transmitted to the apple causing much damage to trees by killing the young tender growths, as well as blighting of the

blossoms and killing out of the fruit spurs. If any variety of pears is recommended whatever, it should be the Keifer.

SMALL FRUITS

STRAWBERRIES—There are many choice varieties of strawberries all of which would be productive if managed right. Among the best varieties will be found Michaels Early, Senator Dunlap, Tennessee Prolific and many others. There are also some varieties of Ever Bearing strawberries which produce fruit throughout all the season. The best of these is the Progressive, but the Americas and Superb are also good producers. They bring forth the usual crop of berries as do the other varieties, after which time they continue to bear until late frost. Strawberries in most cases should be planted on sandy clay loam soil, reasonably fertile and preferable an eastern exposure.

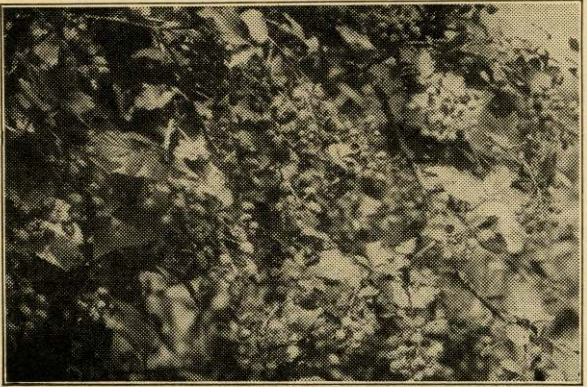
BLACK RASPBERRIES should usually be planted in a deep fertile loam soil that is full drained. To secure best results in a fruit garden, raspberries and black berries will do best if trained on stakes in the same general way as tomatoes. The Kansas and Cumberland are the two hardiest and most prolific.

RED RASPBERRIES (or Red Cap Varieties)—The several varieties of red raspberries require the same kind of soil as the black ones, but do not necessitate staking. The Miller's Red, Cuthbert and Marlboro are perhaps the best for home use. The St. Regis is an everbearing red raspberry which bears fruit all season as do the everbearing strawberries, and are very fine quality.

GRAPES—Grapes respond very readily to fertile soil. There are many varieties among the blue or black grapes all of which ripen their fruit about the same time. The Concord is possibly the best for all general purposes. The Campbell's Early, Champion and Moore's Early are very prolific varieties; also the Worden which is a seedling of the Concord.

WHITE VARIETIES OF GRAPES—Niagara, Pocklington and Moore's Diamond. The Niagara and Moore's Diamond when well cultivated and sprayed, produce fruit of high quality. The Pocklington is perhaps the latest in ripening of the white varieties.

PURPLE VARIETIES—The Agawam and Lutie are to be preferred to other varieties of this color, and are choice varieties; preferred by all who like large size grapes of delicious quality.



Productiveness of the Blackberry

RED VARIETIES—Brighton, Salem and Delaware are the principal red grapes adapted to this climate.

BLACKBERRIES—Improved varieties of blackberries are usually capable of adjusting themselves to any kind of soil, and will in most cases, do well where the wild ones will grow. The most profitable are the Early Harvest, Eldorado and Blowers.

CURRENTS—Among the best varieties for home use are the Black Napel, Cherry, Fay's Prolific and Perfection. If currants are to produce well they should be planted on fertile soil and well cultivated as other garden crops. They are very hardy in all parts of West Virginia.

GOOSEBERRIES—Downing, Houghton, Industry and Pearl. The Pearl is a very large fruiting variety and perhaps the best for general purposes. The Houghton is a well known variety, being exceedingly productive.

DISTANCE FOR PLANTING FRUIT TREES, VINES, ETC.

Apple trees, 36 feet apart, and if desired, peach trees may be planted between the apples. Peach trees when set alone, 16 to 18 feet apart. Sour Cherries, 20 to 22 feet apart. Sweet Cherries, 28 to 30 feet apart. Plums, 24 feet apart. Quinces, 12 to 15 feet apart. Strawberries, 18 to 24 inches apart in the row with rows $3\frac{1}{2}$ feet apart. Black Raspberries, $2\frac{1}{2}$ to 3 feet apart in the row with rows 4 feet apart. The same for Red Caps. Grapes 6 to 8 feet apart with rows 6 feet apart. Blackberries, 3 to $3\frac{1}{2}$ feet apart in the rows with rows 4 to 5 feet apart. Currants, 2 to $2\frac{1}{2}$ feet apart in the row with

rows 3½ feet apart. Gooseberries, 3 feet apart in the row with rows 4 feet apart.

TREES AND SHRUBBERY FOR DECORATIVE PURPOSES.

There are many varieties and species of ornamental trees and flowering shrubs that can be used very effectively in beautifying grounds; about factory locations, office buildings, parks, and other such public places, some of which are the European Mountain Ash, Tees Weeping Mulberry, Weir's Cut Leaf Weeping Birch, Kilmarnock Weeping Willow, Maiden Hair or Ginko Tree, White Birch, Camperdown Elm, Catalpa Bungi. Some of the evergreens used in decorative work are the Irish Juniper, Balsam Fir, Norway Spruce, Arbor Vitae (American) and Colorado Blue Spruce.

ROSES (Hardy Perpetuals)—American Beauty, General Jacqueminot, John Hopper, Marshall P. Wilder and Paul Neyron are very delightful varieties.

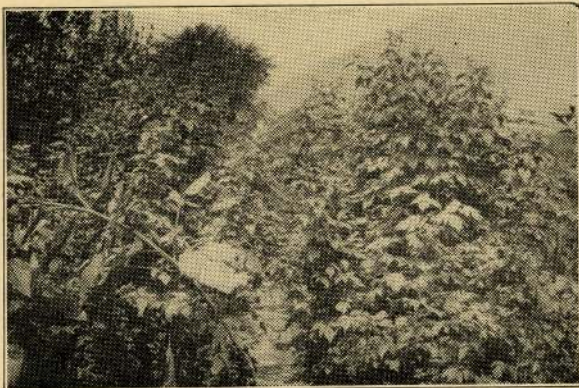
TREE OR CLIMBING ROSES—Crimson Rambler, Dorothy Perkins are considered the best bloomers and hardiest. Moss Roses—Admiral Dewey, Perpetual White, Captain John Ingram are among the best varieties of this type.

DECORATIVE SHRUBS—Magnolia (Grandiflora) and Magnolia (Saulangeana). The last species mentioned is a dwarf tree scarcely, if ever, attaining a height to exceed 15 feet. This species bring forth its flowers early in the spring time before producing any foliage.

HYDRANGEA (Paniculata Grandiflora)—These plants are absolutely hardy, grown in any soil and bloom the same year they are set out. They flower abundantly, bearing hundreds of immense pinnacles of bloom, white turning to rose in autumn. An annual shortening of branches tends to increase the size of the flowers. These are very fine and valuable for cemetery planting.

WHY NOT MAKE THE SHADE TREE FEED US

There are many places about the farm and home where shade trees are very necessary, and where the right kind of trees are used; they not only beautify the home grounds in appearance, but afford great comfort to the owner and the live stock. If nut bearing trees were used instead of some of the trees now being extensively used for shade, the farm would not only retain all the beauty it now has, but the nut bearing trees would add a valuable asset to the farm that the ordinary shade trees cannot. Nut



Red Raspberries in the Fruit Garden

bearing trees are far more valuable than they are really considered to be; not only for the valuable timber they produce, but the extremely high quality of food products they yield.

About springs two or three shade trees are very necessary. In pasture fields a shade tree now and then is a valuable asset to the owner. Along roadways through the farm attractive driveways can be made that afford much pleasure to farm life. And around barn lots and building on the farm, and especially the home. This not only adds to the attractiveness and cheerfulness, but a direct means of establishing more economical, well regulated and happy homes on the farm, the thing which makes life all the more worth living. Along public roads around public institutions such as school houses, churches, court houses, etc., Black Walnut, English (Persian) Walnut, Butternut, Pecan and Hickory could be planted which would develop into shade just as soon as any other tree and at the same time be getting ready to produce something of real value.

No doubt, within the next few years there will be hundreds of miles of permanent roads constructed in West Virginia. Such trees as these could be planted along these permanent highways in favorite places of natural scenery and where the soil is adapted for their growing. West Virginia in a few years would have permanent driveways of such rare beauty that it would create world-wide attention.

In many parts of West Virginia, especially in the commercial section, nut bearing trees could be

planted along with fruit trees and put in such places as are not favorable for fruit by reason of frost pockets, in low altitudes and on steep rocky land that is too rough to cultivate and land that would wash badly. By planting nut trees on such ground and giving them proper attention in a few years would be yielding as much profit as fruit trees. Black walnut and hickory are both native trees and bear abundantly in West Virginia. By reason of their late blooming they bear a crop of nuts just about as often as fruit trees bear fruit. Another advantage is that they do not require expert pruning.

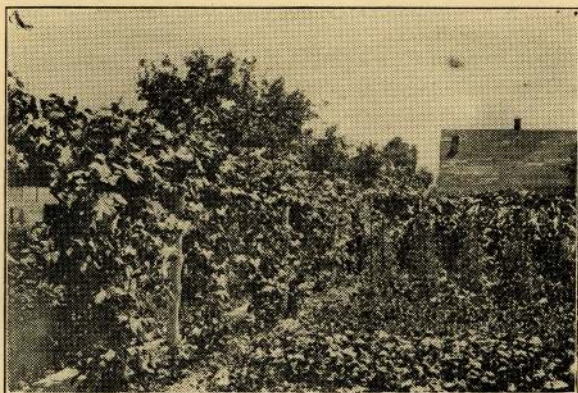
The real value of nut bearing trees has not yet been appreciated. It is presumed that the average farm in West Virginia has approximately fifty trees growing on it that are considered valuable for shade. Suppose these trees were Black Walnut, Hickory, English or (Persian Walnuts) or Pecans, the latter three capable of producing more food than the Black Walnut, but not so valuable for timber. These fifty Black Walnut trees when twenty years old would produce 5,000 pounds of walnuts which would be an average conservative estimate; and the best improved varieties would contain 1,500 pounds of walnut meat, which would be equal in food value to 4,657,500 calories, which in food value would be equal to 5,014 pounds of beef, equivalent to $6\frac{3}{4}$ average three year old steers, 3,357 pounds of pork, equivalent to a little more than thirteen average dressed hogs, considering the average at 250 pounds each. It would require 3,064 pounds of beans or fifty-one bushels, 19,178 pounds of potatoes or $319\frac{1}{2}$ bushels to equal 4,657,500 calories.

DIRECTIONS FOR TRANSPLANTING TREES, VINES, AND PLANTS.

PREPARATION OF THE SOIL.

For fruit Trees, the condition of the soil must be the same as for growing any other farm crop successfully.

If the land on which trees are planted is not in condition, make it so by thoroughly underdraining, deep ploughing or subsoiling. Enrichen it in the usual manner by turning under cover crops, such as clover, soy beans, cow peas, vetch, rye or apply stable manure, or where it can be obtained, vegetable mould well rotted. This is adapted for producing a large amount of fibrous roots, and it is through these the tree is fed.



Vegetable Garden With a Row of Grapes

PREPARING THE TREES FOR PLANTING.

Always remove any straw or moss that may be about the roots of the trees or plants before planting. Never put coarse vegetable matter of any kind so as to come in contact with the roots of the trees or plants. The broken or mutilated portions of the roots must be cut off so as to leave the ends smooth and sound, and the ends of all other roots should be pruned back so as to be from 4 to 6 or 7 inches in length. The central or tap root should be shortened with reference to its diameter and in proportion with the lateral roots. From these freshly cut ends the new fibrous roots usually start.

PLANTING.

The holes that are to receive the trees must in all cases be large enough to admit the roots freely without cramping or binding them from their natural position. They should be planted one inch deeper than they were in the nursery, and no deeper, except in cases of dwarf trees. Dwarf trees should be set so the point of union comes two or three inches below the surface of the ground, the trees being held upright. The finest and best soil from the surface should be carefully worked among the roots with the hands.

Set the tree as firm as a post. Thoroughly pack and stamp the soil with the foot. The last inch or so of soil at the surface should be laid on lightly and loose to prevent evaporation of the soil moisture.

MULCHING.

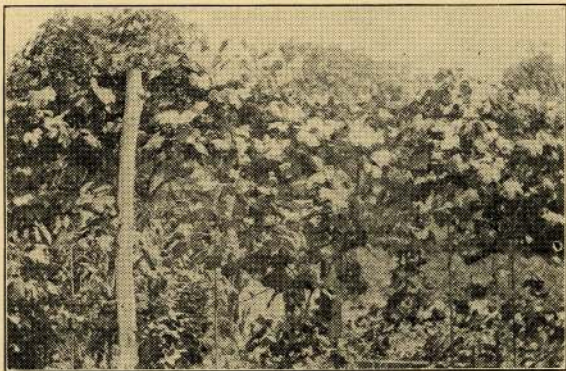
This is done by placing a layer of coarse vegetable matter such as straw, weeds, clover hay, cow peas, etc. from 4 to 8 inches deep extending one or two feet further in each direction than the spread of the branches. This protects the earth about the roots against drying or baking. The mulch should be put on in March or the first days of April. It should not come in contact with the trunk of the trees, not closer than one foot in each direction, as field mice may nest there and do considerable damage to young trees.

PRUNING.

The stems should now be put in condition for the formation of the top by removing all the limbs to the point where it is desired to have the top, then cut back the remaining limbs, leaving from four to six buds of last season's growth. In the absence of limbs suitable to form a top, cut the tree down to the required height to form the head, leaving the dormant buds to form the top. The necessity of pruning vigorously at time of planting is generally a very ungrateful one to the planter as it injures for a time the appearance of the trees to an untrained eye. It should, however, be unhesitatingly performed. All the branches, to the extent of at least one-half the length of the previous year's growth being removed. This will help to give the proper form to the trees, and have the limbs spaced so that the four or five limbs that form the head of the trees are equally and symmetrically distributed over about one foot of the trunk. The head may be left low or high, as the taste of the planter may prefer or as the nature of the trees, in some cases, may require. No stock planted in the fall should be pruned until the hard freezing weather is past, and in the spring it should be done before the sap starts.

STAKING.

If the trees are tall or in exposed situations, they should be supported by stakes to prevent injury from the winds. Staking is best done by driving two straight sticks firmly into the ground, one on each side of the tree about one foot from it and fasten the tree between them with a band of cloth or other soft material so that it may be kept in an upright position without injuring the bark till the roots obtain a firm hold in the soil.



Vegetable Garden and Grapes

PEACH TREES.

In most cases peach trees should be planted immediately after receiving them, or if not prepared to do so, the roots should be well protected in the ground. They are tender and will not stand exposure to the sun and wind. Many are lost simply for the want of care. As soon as planted, cut back all side branches to within one or two inches of the main stem. **Make this the invariable practice.** The growth will be much more rapid and vigorous in consequence of this pruning, and by adhering to it, and by immediately planting or covering the roots in the soil, very few, if any, trees will be lost. The top of the tree should be cut off at a point where it is desired to form the head.

ROSES.

Roses should be planted in a deep rich well drained soil so that the top roots will not be more than two inches below the surface. After planting, the soil should be well spaded up around them so as to form a channel all around the plant, pour on this some liquid manure, mixing with it the soil that is to be replaced. It is an excellent plan to mulch the surface with fine grass to hold the moisture. Prune every spring before the buds start, cutting back the last growth. Climbing roses may first be allowed to partly cover the space desired. Old, decayed or diseased branches should be removed promptly. Every autumn compost should be placed about the stems of the plants and spaded into the soil the following spring.

Grapes require a dry mellow reasonably fertile, well drained soil deeply worked and a warm sunny exposure. In planting, give the roots plenty of room. Spread them out not more than four or five inches under the surface and settle the soil firmly around them.

Pruning

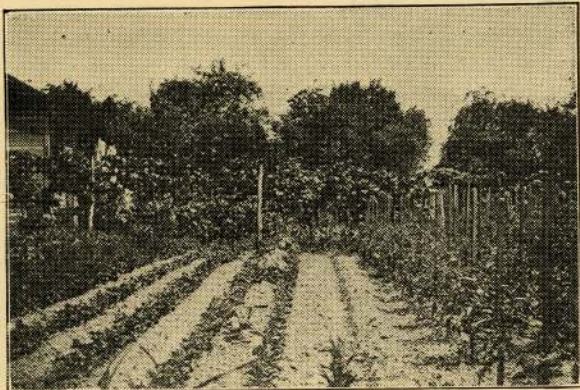
Vines when set should be cut back to within two or three buds of the root, in November or early in the spring before the sap starts. In open culture, they should be pruned liberally. In pruning tender or weak vines, leave more wood than is needed, as some may be killed, and finish pruning in the spring as soon as the foliage has developed and the vine has shown its vitality. In summer, allow a good growth beyond the fruit and about midsummer pinch the ends of the branches to check them and other feeble laterals on which there is no fruit may be removed. Then there will be enough foliage to absorb matter and prepare nutriment. By checking the growth of the wood, the remaining portion of the vine will be appropriated to perfect the fruit. Do not pick off the foliage as the foliage, and not the fruit, should be exposed to the sun.

Two mistakes are usually made in the management of grapes. First—to cut off all useless wood in the spring and, second by depriving the plant of the necessary foliage by close pruning in summer. If too much fruit sets, thin it in season that the juice of the vines may not be wasted on what must be removed.

BERRIES AND SMALL FRUIT PLANTS.

Berries should have a fertile soil and be kept under constant cultivation. Mulching is of special value. Black Raspberries and Blackberries should have the old wood cut away each year and new canes pinched off when three feet high.

Strawberries should be mulched late in the fall. Uncover the crowns early in the spring. Remove mulch after fruiting and spade in a light dressing of manure. If plants are set for fruit, grow them in rows and keep the runners off after the rows are the desired width.



Vegetables and Blackberries

If Currants are to produce their best without cultivation heavily mulch and prune so that new wood is continually being made by the plant. Care should be taken that all diseased or dead wood be properly removed. All small fruit plants such as strawberries, raspberries, blackberries and plants of that nature should be planted early in the spring and by so doing avoid the hard winter freezing as the plants are likely to be drawn out of the ground by freezing.

CULTIVATION AND TRAINING AFTER PLANTING

Many planters after having taken great care and placed expense upon themselves, in the selection and planting of their trees, fail of success by neglecting to give them care and attention which is very essential. Caterpillars and canker worms, grubs and borers, slugs and aphids, disease and blight must be watched for and fought against and remedies faithfully applied. The wants of the growing tree or plant must be carefully foreseen, and an earnest effort made to insure health and productiveness. The requirements for pruning vary somewhat according to the kind of trees. Some prefer, however, the low training for all trees and especially for dwarf trees. The pruning should be done each year so the cutting of large limbs will not be necessary. Care must always be used to keep the head of the trees open and well balanced, and cut the limbs that are superfluous. Trees should be pruned as early as possible, up to the height it is intended the future head should be. The cutting of large limbs should be avoided when pos-

sible as decay is likely to commence at point of separation and extend into the trunk. When such removal is absolutely necessary, the wounds should be cut smooth and a covering of paint or grafting wax applied to protect them from the weather. Dwarf trees, particularly of the pear and apple, while young require more pruning than any kind of trees, in order to bring the top to a suitable form. For the first two or three years, fully one-half the growth of the previous year should be removed by heading or reducing the length of each limb. The top limbs require more cutting than the lower ones, thus producing more equal distribution of sap and consequent vigor to both lower and upper limbs. Three or four years after planting, the pruning is only to keep the trees in the symmetrical shape and prevent limbs from taking disproportionate growth. This regularly attended to will obviate the occurrence of any large limbs to be removed.

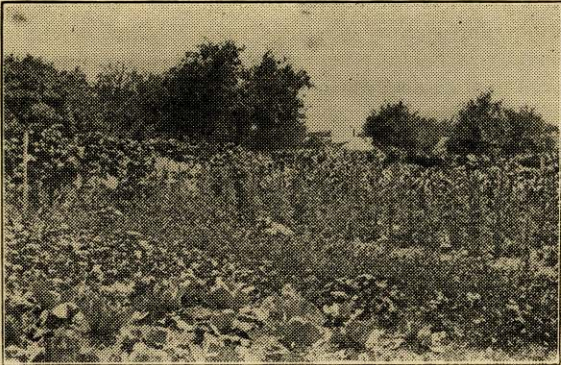
Those who are obliged to plant trees in fields of grass or grain should see that they are well mulched with some good nutritious vegetable matter and that the soil be kept loose and moist about the trees. Truck crops such as potatoes, tomatoes, beans and the like are greatly preferred in such plantations for the first five years. After this time, standard apple, pear, cherry and plum trees will grow and produce fairly well in sod. Dwarf trees and peach trees should never be planted on land that can not be given good cultivation during the growing season, more especially the peach trees.

SUMMER PRUNING.

Those who are impatient to see fruit upon their trees, as is often the case, particularly with respect to trees tardy in commencing to bear, may expedite the fulfillment of their wishes by employing a process of summer planting. During June or early July pinch off the ends of the young growths; this retards for the time being the flow of sap and hastens the formation of fruit buds.

PLANTING NUT BEARING TREES.

In all respects nut bearing trees should be planted in the same general way as apple trees, except Black walnuts, Butternuts, English or Persian walnuts which should always be planted in deep fertile soil.



Fruits and Vegetables

The central or tap root of the walnuts, hickories and pecans are in most cases longer in proportion to the lateral roots than other kinds of trees, and will require deeper holes.

IMPORTANT.

The roots should have plenty of room and great care should be exercised to have them as nearly as possible, in the same position they occupied previously. The roots occupying this position should be carefully arranged and the top properly pruned, regardless of the injury to the present appearance of the tree. During transplanting so many of the fibrous roots are destroyed so that it is very essential the top be correspondingly removed. Be sure to remove label before trees begin to grow as the wire will injure the tree. When set in autumn, a mound of soil 5 or 6 inches in height should be made about the trees. This is very essential as it keeps them from being swayed by the winds or drawn out of the ground by freezing. This, however, should be removed in the spring. In sections where winters are extremely severe trees procured in the fall can best be cared for by covering the roots in the ground during winter and planting in the spring.

To successfully care for trees during winter, select a spot where no surface water will stand, that will not overflow and that is well drained and no grass near to invite mice. Dig a ditch deep enough to admit the layer of roots and slope enough to permit the trees to lie at an angle of not more than 30 degrees with the ground, place a layer of trees, which

should not be more than two or three trees deep, in this trench, cover the roots with fine soil extending well up on the trees and **see that this is firmly packed**; then add another layer of trees overlapping the first and continue until all are placed in, then finish by putting on soil thick enough to prevent freezing the last layer.

WHEN TREES ARE RECEIVED IN A FROZEN CONDITION.

The shipper in all cases should use plenty of such material as straw, shingleto, moss or excelsior and when shipment is made it should contain just enough moisture to maintain a living condition of the trees or plants. Trees packed this way in bales or boxes, if paper lined, will keep for many weeks. Severe freezing does not injure trees or plants, **it is the quick and improper thawing**. If trees are received in a frozen condition, the package should not be disturbed in any way no matter what kind of a package it is. If convenient, put the package in a cellar that is cool, well ventilated and contains no heat whatever, and let the trees remain undisturbed until all frost has left them. To properly thaw trees as above described, it will require from 6 to 10 days, depending upon the size of the package and the temperature of the cellar. The temperature, if possible, should be kept between 34 and 40 degrees. If no cellar is available, the next best way is to bury the package in the ground, covering it with earth from 8 to 12 inches deep. Select a well drained place. It will require about the same length of time one way as the other. Great damage will be done to the trees if unpacked while frozen. Better leave them a week too long than unpack a day too soon. If properly thawed, they will be in perfect growing condition.



