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Pruning

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TOOLS

Do you want to prune your fruit trees successfully? If you do, good tools are essential.

No man who pretends to be a fruit grower will be satisfied to work without the best implements.

For pruning the young trees the best tool is the pruning knife, preferably of the hawk-hill type. If the knife is kept well sharpened, the cuts may be made smoother and closer to the trunk than with any other tool.

SHEARS FOR YOUNG TREES

The pruning shears or hand shears are widely used, especially for young trees. There are many different types of shears, but there are few good ones. The steel should be considered in making a selection. The cheap shears will always prove most expensive. The shears having a volute spring have given better satisfaction than most types. The hand shears can be worked more easily and rapidly than the knife, but the cuts cannot be made so close. A sloping cut should be made to prevent crushing the limbs.

The long handled shears are widely used among fruit growers because of the speed with which they

may be worked. This speed induces carelessness and cuts are often poorly made. This type of pruner leaves stubs, and they should always be avoided.

HEADING BACK SMALL LIMBS

The pole pruner cannot be safely used except in heading back the small limbs. Here it is a great time saver and is a valuable tool. It is sure to leave stubs, however, when used on larger limbs.

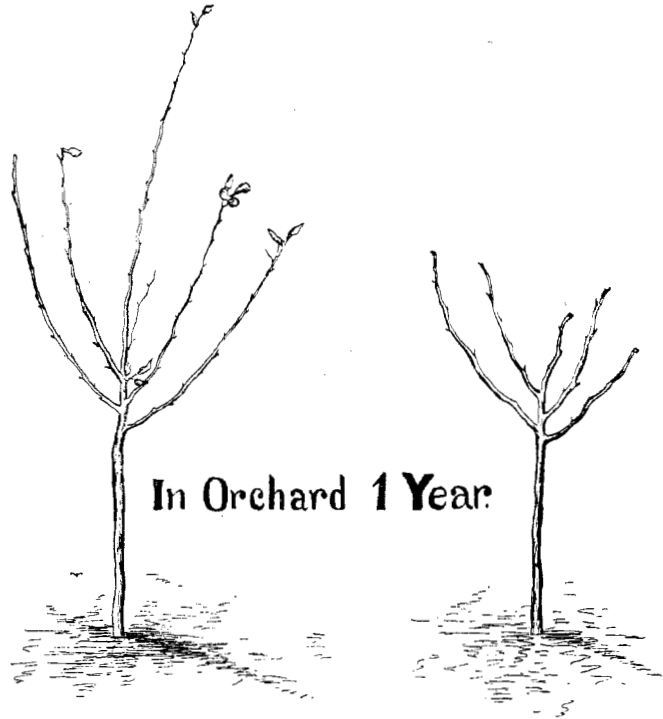
The pruning saw is the most important tool in dealing with the older trees, especially in the neglected orchard. Many of the saws offered for this work are not only worthless but a menace. The two edged saw has nothing to recommend its use, and it may badly damage the trees. The meat saw type is recommended by some men because the blade can be turned so that work may be done in close crotches. The point that gives this saw its advantage is also a point against it. The blade has a tendency to turn while cutting and often makes a crooked cut that requires another attack before a smooth surface can be had. It is also too heavy, and the back prevents a continual cut through a large limb. It

cuts rapidly, however, and the low prices of blades makes it possible to have a sharp saw at all times.

USING CALIFORNIA SAW

The California saw has a curved blade making a draw cut. This saw

has a full grip handle so that it may be used with the gloved hand. The blade may be had in lengths varying from 18 to 24 inches. This saw works rapidly and is light in weight, durable, and well balanced. The nar-



Before Pruning. After Pruning.

is well adapted to light work in the orchard and can be used to advantage in the smaller trees.

A saw that has been used widely in the east can be generally recommended for the heavier pruning. This saw has a comparatively narrow blade, being $3\frac{1}{2}$ inches wide at the butt and 1 inch wide at the tip, and having seven teeth to the inch. It

row blade makes it adapted to close work.

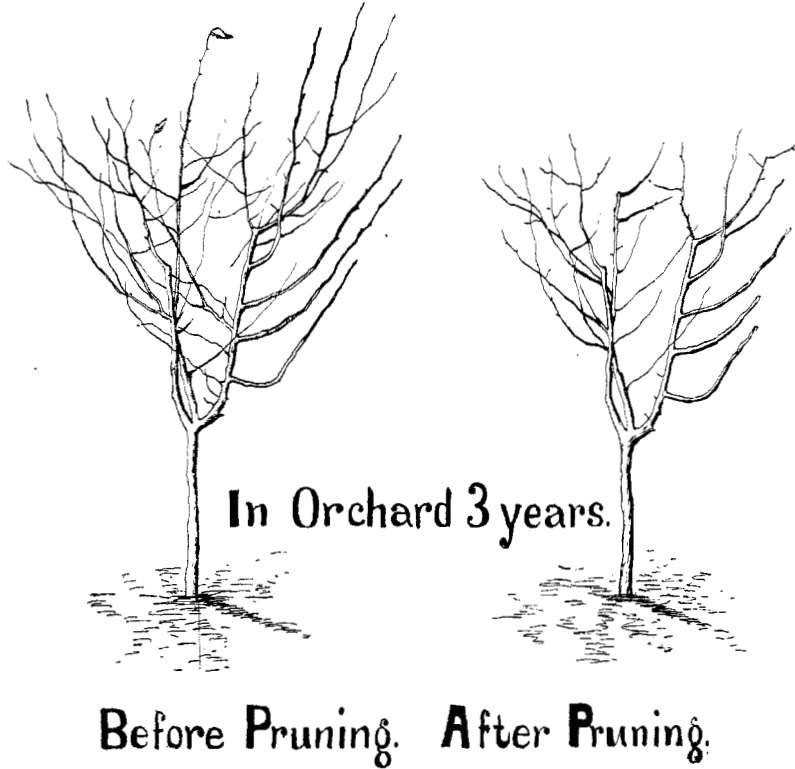
Many implements have been offered that are attached to poles, but most of them are too unwieldy and many are too crude in workmanship to merit their use.

PRUNER MUST KNOW FACTS

Before pruning can be judiciously carried out, the pruner should have

some knowledge of the way in which the fruit buds are formed and on what portion of the tree the fruit is borne. The orchardist who practiced the same system of pruning for his apples as for his peaches would make a failure of his crop.

light is shut out they soon die. If these die or are broken, they can never grow again, and the only way they may be replaced is by training watersprouts. This is a slow and uncertain process.



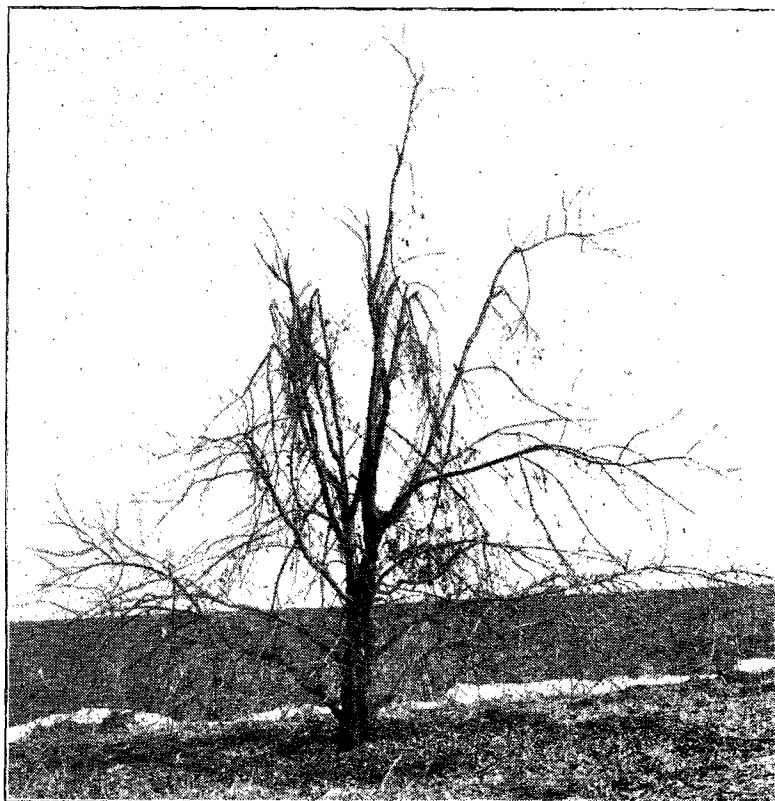
The apple produces its fruit buds on short crooked or irregular spurs that are 2 or more years old. In pruning, the object should be to produce the formation of new spurs and to save all that are already on the tree. Don't let a desire for regularity influence you to cut off these ugly objects, for they are the source of your crop. If the growing conditions are good, these spurs may persist for many years, but if the sun-

SEASON

The time for pruning will be governed to a large extent by the condition of the orchard. Where winter pruning is not too extensive, it is usually carried on in the late winter months. Pruning in winter is not dangerous to the tree, nor is it dangerous to saw off a limb when the wood is frozen. The greatest drawback to midwinter pruning is the inconvenience to the pruner.

The effect of heavy winter pruning is to promote a heavy wood and water sprout growth. The reason for this is that the roots have been unchanged while the top has been reduced. To restore the balance that normally exists between the top and the root sys-

after the rapid growth of the spring has been completed, generally in June or July. This type of pruning tends to overcome the production of water sprouts and heavy wood growth and is frequently recommended as an agent for increasing production and pro-



A MISSOURI PIPPIN BROKEN BY POOR DISTRIBUTION OF FRUIT

tem, a vigorous growth takes place. This is important in rejuvenating old or neglected trees, but should be avoided in healthy trees of bearing age. A light pruning, however, will not cause the excessive wood growth, and may keep a tree in good physical condition.

TO INCREASE FRUIT PRODUCTION

Summer pruning should be done

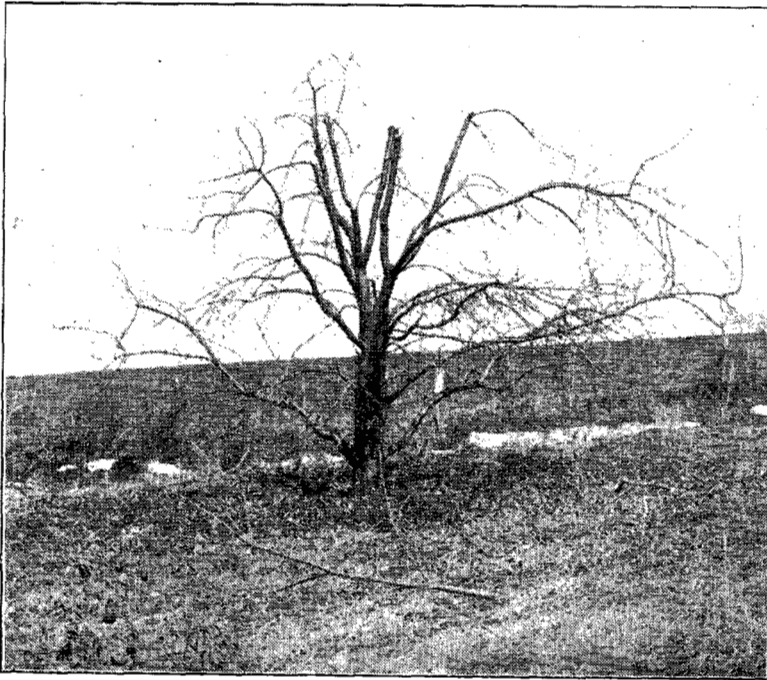
moting fruit production in barren trees. The summer pruning must be light, consisting in pinching back the growing shoots, and is not possible except in trees that have been well cared for. Heavy pruning tends to cause the formation of secondary or lateral shoots on the limbs cut back. Summer pruning is made difficult by the heavy foliage that naturally

exists at the time, and if the work is not carefully done, injury may be done to the growing fruit.

The pruning should be done annually. If it is done periodically, the tree becomes unbalanced and too many large limbs have to be removed. Such a condition is liable to be followed by

ger of infection by fungous diseases.

If a large limb must be removed the pruner must be careful to prevent the limb from splitting at the base. He may do this by cutting off the limb a short distance from the trunk and then removing the stub. Even this additional work may be avoided by



THE SAME TREE AFTER RENOVATION

heavy wood growth, and heavy fruit production does not take place in trees that are making rank wood growth.

KEEP FUNGOUS DISEASES OUT

All cuts should be made close to the limb from which the branch is to be cut, and the surface should be as smooth as possible. This enables the callus to form and grow most easily. A cut should never be made so that water can lodge on or around it, for such a condition will increase the dan-

making an undercut from one-third to one-half through the limb. In making such a cut, it is often difficult to have the cuts meet and in that case the cuts should be smoothed over to aid the healing process.

HOW TO TREAT YOUNG TREES

The usual age of trees at the time of planting is either one or two years. The pruning of a two-year-old tree at the time of planting is the same as for a one-year-old after one year's growth in the orchard.

The one-year-old tree is a straight whip, varying in length according to the variety and the conditions under which it has grown. The one-year tree has the advantage of the two-year tree in that the grower can start the head at the point at which he desires. The height of heading should be between 14 and 24 inches. Whether the trees are pruned to a high or a low head is a personal question and there are points in favor of both, but the weight of facts is in favor of a low-headed tree. The liability of damage from sun scald is lessened, the trees are easier to prune and to spray, the fruit is harvested more easily, and the trees are not so badly damaged by wind.

The method of pruning is the same for either type. The whip should be cut to a bud, generally on the south side, as the winds often reduce the growth on this side of the tree. A smooth cut should be made, sloping away from the bud to hasten healing over. If the trees are strong and the season favorable, from four to eight shoots will be sent out on the original stem. These shoots are to form the scaffold branches. From three to five of the strongest shoots should be selected and these should be evenly distributed about the trunk. Avoid leaving the branches that will later form crotches, for the trees will split under the first heavy load. After removing the unnecessary branches, the selected shoots should be cut back from one-fourth to one-third. The cut should be made smooth and close to a bud; to an outside bud for an upright tree and to an inside bud for the spreading and drooping branches.

IMPROVING FORM OF TREE

The pruning for the second and third years will consist in improving and developing the form of the tree. The main leaders should be cut back as in the younger trees. The lateral

shoots should not be cut back so severely, for the grower should aim to develop a good strong tree. If the branches are crossing or interfering, they may be headed back, or the weaker shoots may be removed. All shoots that grow back through the center of the tree should be removed.

The pruning from the third year should be done so as to form a compact tree.

After this time, the formation of the fruit spurs should be started. If the growth is very rank, the spurs will form slowly, but in the slow growing varieties the spurs are formed early. Besides the natural formation, the heading back of the small shoots may convert these into fruit spurs. If this work on the young trees is done regularly, only small limbs will need to be removed, and the tree will come into bearing at an earlier age than otherwise.

WHERE WORK IS SIMPLE

For the bearing trees that have been cared for since planting, the work of pruning is simple. Several points are essential, however.

If the tree is growing too upright or too spreading, cut back the leaders to a side shoot that is growing in the desired direction. The upright tendency is more often found, in which event the heads should be shortened back to a side stock that is growing down and out. Do not cut the young shoots in the center, as they tend to send out laterals that are hard to prune into shape.

Keep the top sufficiently open so that the sunlight and air can freely circulate through the tops. This is necessary for the ripening of the fruit and the formation of fruit buds. Small limbs should be removed, but the work should not be done so that spaces are left in the top.

Cut out all diseased or dead wood.

Save all the fruit spurs and try to produce new ones.

Cut out all crossing and interfering branches.

In a well grown tree, all water sprouts should be removed. If any are needed to replace lost fruit spurs, they should be cut back to two buds. This operation may need to be repeated. All branches growing back through the center of the tree should be removed.

TREATING NEGLECTED ORCHARDS

There are many orchards that have not been properly pruned. These require a different system. As a rule, neglected trees are void of fruit bearing wood along the main branches and the tops are bushy and too high for spraying or for harvesting the fruit handily. In such trees the tops must be thinned out to admit more sunlight and air, the tops should be lowered, and new fruit bearing wood must be produced.

The first operation should be to remove all dead and diseased wood. The plan for the shape of the tree may then be made. The work of lowering the top should cover a period of three or four years. This disturbs the balance of the tree less than one very heavy pruning and also enables the tree to become gradually hardened to the greater exposure to the rays of the summer sun. The pruner must be very careful not to break off or remove more bearing wood during this operation than is necessary.

The tops of the trees should be lowered by cutting the leaders back to such lower branches as have a spreading habit of growth, preferably such as grow toward the outside of the tree. Trees that have long, slender branches are liable to break if a heavy crop is produced. Such limbs should be shortened more severely than the

stocky limbs. The side growth may also be shortened, if necessary.

VIGOROUS GROWTH IS PRODUCED

This type of pruning causes a vigorous growth in the remaining limbs and is likely to produce many water sprouts. These should be thinned out if exceedingly abundant, but many will be necessary to form new fruit spurs. These should be pinched back early in the summer as they grow rapidly, but if left until the following winter, they should be cut back to two buds. Only one-year-old shoots should be used for this work however. Besides heading back the water sprouts, it is usually necessary to regulate and thin out the vigorously growing top after the first year. An open headed tree can then be made and the cost of spraying and picking will be greatly reduced.

PEACH

The apple tree produces fruit buds on short, irregular spurs that persist for many years, while the peach produces fruit buds only on one-year-old wood. To secure a regular supply of fruit buds, the tree should be systematically pruned so as to produce an abundant new growth. The fruit buds form more readily at the extremities of the branches if the trees are unpruned, and under such circumstances a heavy crop may break the trees.

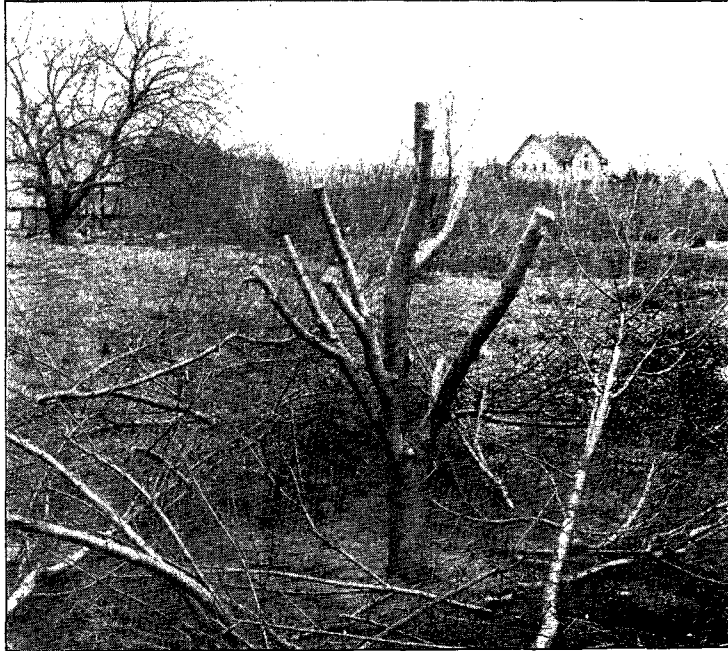
PLANT YEAR-OLD TREES

One-year-old trees are generally preferred for planting. These consist of a single stem: though with sometimes a few small shoots. The main stem should be cut back to a bud from 12 to 18 inches above the ground. The small side shoots are usually weak and immature and should be cut off close to the main stem. If the trees are large and the side shoots are well matured, they should be pruned in the same way as two-year-old trees.

At the end of the first season's growth, the one-year-old tree should have formed from five to eight side branches. Either three or four of the strongest shoots should be selected to form the scaffold branches of the tree. These limbs should form equal angles with the main stem. The selected limbs should be ar-

and these should be cut close to the shoots. The others should be cut back and trained to fill in the more open spaces in the framework of the tree.

The work in the following spring is similar. The low and open head should be carefully completed. The tree should be so balanced that the



A PEACH TREE DEHORNED WHEN FAILURE OF THE CROP WAS CERTAIN

ranged to form a foundation for the head that will not be too close.

HEAD BACK THE LEADER

If the growing season is favorable and the culture is good, such of the scaffold branches will produce from three to four shoots and one strong leader during the first season's growth. The leader should be headed back from one-third to one-half of its length. It may be necessary to remove some of the laterals

maximum production of fruit is produced at a height that will keep the cost of picking and spraying as low as possible.

PERFECT SHAPE OF TREE

When the tree reaches the bearing age the pruning should be planned in such a way that the general shape of the tree is perfected, though the most important object is to secure the formation of fruit buds. To produce this condition, the leaders or the strongest growing terminal

shoots must be headed back, preferably to a side shoot growing toward the outside of the tree. Heading back the leaders induces the formation of many new shoots along the scaffold branches, and it is on these one-year-old shoots that the fruit for the following season is to be borne. Heading back the leaders also overcomes the tendency that the fruit bearing wood has of "creeping," or advancing along the main limbs. The production of large quantities of fruit near the ends of the branches increases the strain on the limbs and is liable to cause them to break off or split at the crotch.

The lateral shoots should also be shortened, and the young shoots in the center of the tree that have already borne fruit and the weaker twigs that have failed to produce buds should be cut out, as their usefulness has ceased.

PRUNING KNIFE IS BEST

The pruning knife is to be preferred to other tools, and is suited for all the work, if the pruning is done properly and regularly. The peach wood is brittle and splits easily. Consequently the careless use of pruning shears may be injurious.

The pruning season for this state is either late winter or early spring. This is not because of any benefits to the tree that may be derived by pruning at this season but because the danger of winterkilling makes it advisable to do the work after danger from freezing is past.

WHEN INJURED BY COLD

If a fruit tree has been seriously injured by low winter temperatures, the pruning methods already advised must be altered. The top of the tree should be severely cut back or dehorned. If the injury has not been complete, the pruning should be carried on to procure the maximum

number of live buds, without regard to the form of the top. If the killing is complete, the limbs should be cut back to short stubs. With the top so greatly reduced, the undiminished root system will furnish a great surplus of plant food, which will be utilized in producing a heavy growth of new wood. As a rule, this growth is so rank that very few fruit buds are formed the first year, but the balance is more nearly restored during the second season and dehorned trees often produce large crops of excellent fruit. The later pruning of the dehorned trees is similar to that advised for bearing trees and usually must be severe.

Summer pruning is frequently advocated for peach trees after they reach the bearing age. In this work the leaders are pinched back in much the same manner as in winter pruning. The laterals and young shoots home on the scaffold branches should be pinched back, as this treatment is believed to increase the production of fruit buds.

This work should be done in July or August. This date is somewhat later than the time advised for pruning the apple in summer, but peach fruit buds are formed later in the season than those of the apple.

WOUND TREATMENT

Whenever a noticeable scar is made, a dressing should be applied. This is necessary in order to keep out the many diseases that make their entrance through wounds. The wound dressing should be adhesive and impervious to water, and may be an antiseptic. Coal tar products are liable to burn the cambium and check callus growth.

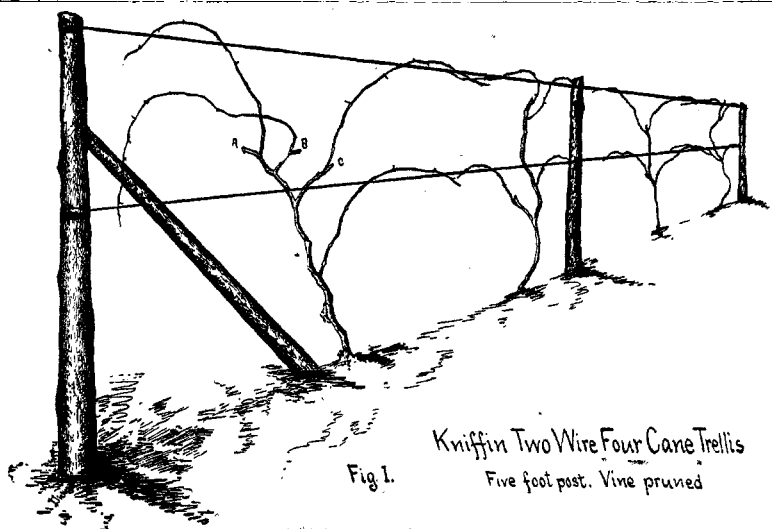
A good wound paint may be made of white lead and raw linseed oil. This should be thick enough so that it

will not run. The paint will penetrate better if the wood is allowed to dry out slightly, but too many times the painting is deferred too long.

GRAPES

The object in pruning grapes, as with other fruits, is to secure the maximum quantity of the highest possible quality of fruit. The vine that is left unpruned may produce a larger quantity than the pruned vine,

Upon the form of the trellis used will depend to a considerable extent the necessities of the pruning. Four systems that are most used are: Four arm, Kniffen; six arm, Kniffen; Fan system, and Munson system. For the hardier varieties of the American grapes the two-wire, four-cane trellis is quite largely used. When the plants are set they are cut back to one or two buds, but the growth the



but the size of the bunches and berries is greatly diminished and the quality of the fruit is inferior to that of the well pruned vine.

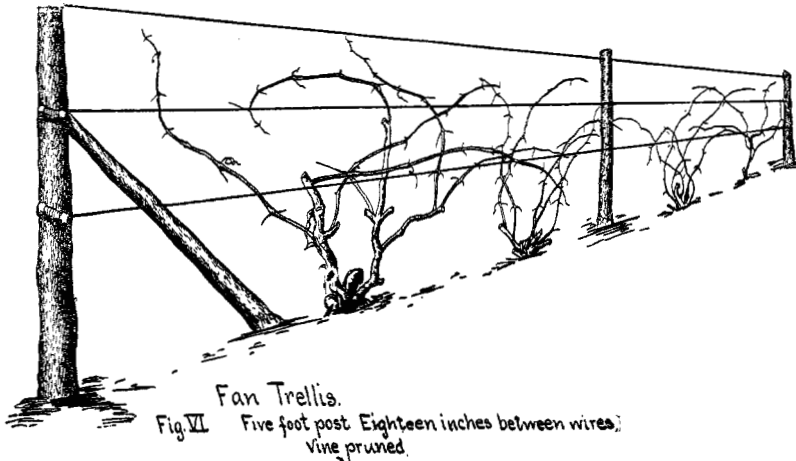
The fruit of the grape is borne on the new shoots which grow from buds formed on the preceding year's growth. The grower should know something of the habits of the variety before pruning. Varieties vary somewhat in their behavior in different soils. In strong, heavy soils grapes usually succeed better if set at a greater distance and may be allowed to carry more old wood than when they are grown in poor, light soils.

first year does not require a trellis. The great point to be secured is as large a growth of strong vine as possible. The succeeding spring one of the canes should be left for training to the trellis and at the lower wire one or two canes are left to form horizontal arms upon which the fruit may be borne the following season. Any bunches of grapes that develop the first year should be sacrificed to promote the greater strength of the vines. If a vine is strong the second year the arms may be trained upon the second wire, but in many cases one pair of arms will be all the vines will mature during the second year's

growth. The following season the pruning will be restricted to the cutting back of the preceding year's growth upon the second wire, and after these arms are well established the pruning will consist of cutting back the year's growth, leaving out a few buds. Subsequent pruning should be to remove all wood except sufficient wood along these arms to

that make a very rank growth and for vines that are growing in very strong soil.

The half hardy varieties, which include most of the hybrid grapes, are best grown upon a fan trellis. This system consists in training from four to six arms over the wires so that they resemble a fan. This system has a minimum of old wood but



produce a maximum crop of fruit. The number of buds left varies with the locality, variety and strength of the vine, and the market for which the fruit is intended. Growers differ in their opinion as to the number of buds to be left, some cutting back as close as 26 or 30 and others leaving double that number. In sections liable to late frosts a larger number of buds are left than where the climatic conditions are more equable, then if the first shoots are killed by frost others will be produced on the slower buds and a fair crop may be produced.

The six arm system is similar to that of the four arm with the exception that three wires and six arms are used. It is suited for varieties

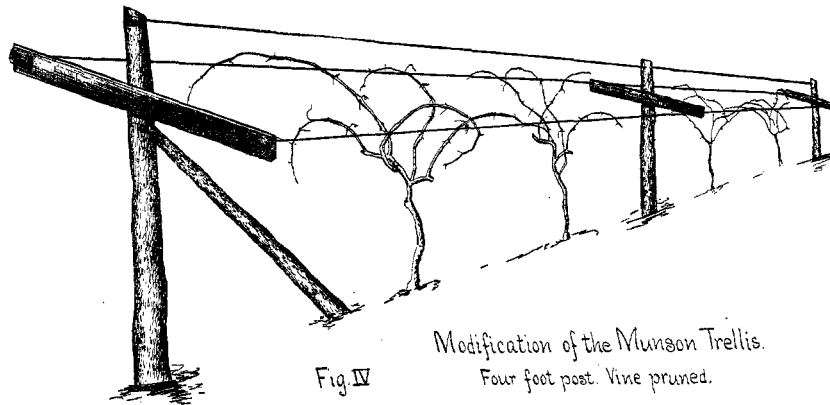
offers considerable inconvenience in picking because the fruit is borne so low on the vines. The fruit is not so well colored in this system as in some of the other systems. Old stems should be removed each year and new canes trained by heading back as advised for the starting of the vines.

The Munson system, sometimes called the overhead system, has a different form of trellis. In this system the posts are four or five feet high and cross arms 18 inches to 2 feet long are nailed to the top. Holes are bored in the cross arms and the wires are stretched through these holes for support of the vines. The third wire may be stretched either above or below at the same level as

the wires that extend through the cross arms. The vine is trained to this middle wire and the canes are trained out to either of the side wires. This system gives some advantage over the others in the amount of surface that is exposed to the sunlight. It is very easy to pick the fruit and cultivation can be carried on very easily.

Another system that is sometimes

vines should suffer some loss in plant food than to leave them untrimmed. Summer pruning should consist only in cutting back superfluous vines and leaves in order that the strength of the plant may be given to the fruit. In the fan system care must be taken that new canes are provided for the succeeding year's crop, and these should be as near the ground as possible. These



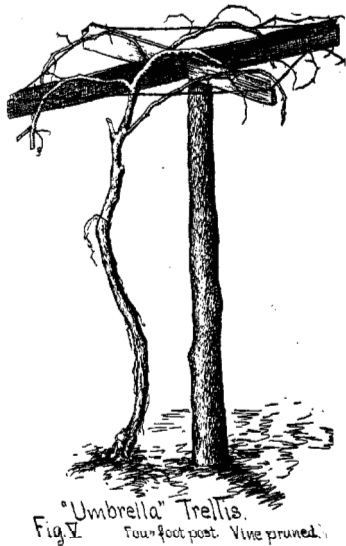
used on hillsides or uneven ground where it is difficult to maintain post and wire trellises is the post and arm, or umbrella, system. This consists of a post and two cross arms. In this system the first and second seasons' growth is devoted to getting strong canes trained to the top of the post, and the secondary vines are then trained over the cross arms. The pruning consists of cutting back the vines to such a number of buds as conditions indicate the vine will be able to support.

The pruning of the grape may be done any time from fall to spring after the leaves have fallen and before the buds begin to swell. If pruning is deferred until the buds swell the vines will bleed badly, but most growers would prefer that the

may be cut back from four to six feet in length, and this will materially help to ripen the wood. Other vines may be cut back rather severely, but care must be taken to leave sufficient leaf surface to protect the fruit from the sun and the birds, remembering also that a considerable amount of leaf surface is necessary for the production of food material for the growth of the fruit and vines. Summer pruning may also be so severe that it will seriously check the growth of the fruit.

Vines that have been neglected for several years offer a problem that is comparable to a neglected fruit tree. Such vines will require considerable judgment to decide whether it is better to lose a year's crop in order to get the vine back in condi-

tion for successful bearing or whether the vines may be so pruned as to give a crop of fruit during that season and get it into condition for the succeeding year. Neglected vines will always be found to have the fruit bearing wood far from the roots



and from the source of food supply. Many times growers will find it is advisable to cut them back close to the ground and start all over again.

BUSH FRUITS

Bush fruits may be divided into two groups as regards their Pruning requirements. Gooseberries and currants produce their fruit on wood that is more than one year old. In Pruning it is the object to secure all lateral branches on wood that is older than one year. Since the fruit is borne on large buds or short spurs, care must be taken to retain these in any pruning. Many times these plants are unproductive because they make such a heavy growth of new wood each season that the fruit buds or spurs do not form on

the older wood. During the summer they should be pinched back as indicated.

In the case of brambles, including the raspberry, red raspberry, black berry and dew berry, the fruit is borne on one-year-old wood. As soon as the cane has borne its crop of fruit its usefulness is ended and it may be removed at any time. As a matter of fact, most of the pruning on commercial plantations is done during the winter following, for the removal of canes from a bramble patch during August or September is not an agreeable task. In case the canes are badly infested with disease their early removal is advisable. Summer pruning is usually restricted to cutting back new growths just before the picking season. This checks the growth of the canes and encourages lateral branches to form, which increases the amount of bearing wood and also affords better conditions for the movement of the pickers.

The number of stems should be regulated at this time and from five to six of the strongest shoots should be selected. The other shoots should be removed, so that the selected canes may develop properly.

The winter or late spring pruning should consist of heading back all of the laterals that have formed on the selected canes. These are cut back to 12 to 20 inch spurs, depending on the growth of the plant. This removes the weakest and poorest buds and is the cheapest and most effective method of thinning.

The time for doing this work varies with different growers, but it is a good practice to wait until the most severe winter weather is passed.

If the old canes were not removed in the summer they should be removed in the spring. For this work, either long

handled shears or a grape hook will be necessary, for the work is made less disagreeable in this way. For the summer and spring pruning, the pruning shears advised for use in orchards will also be found best adapted for this work.