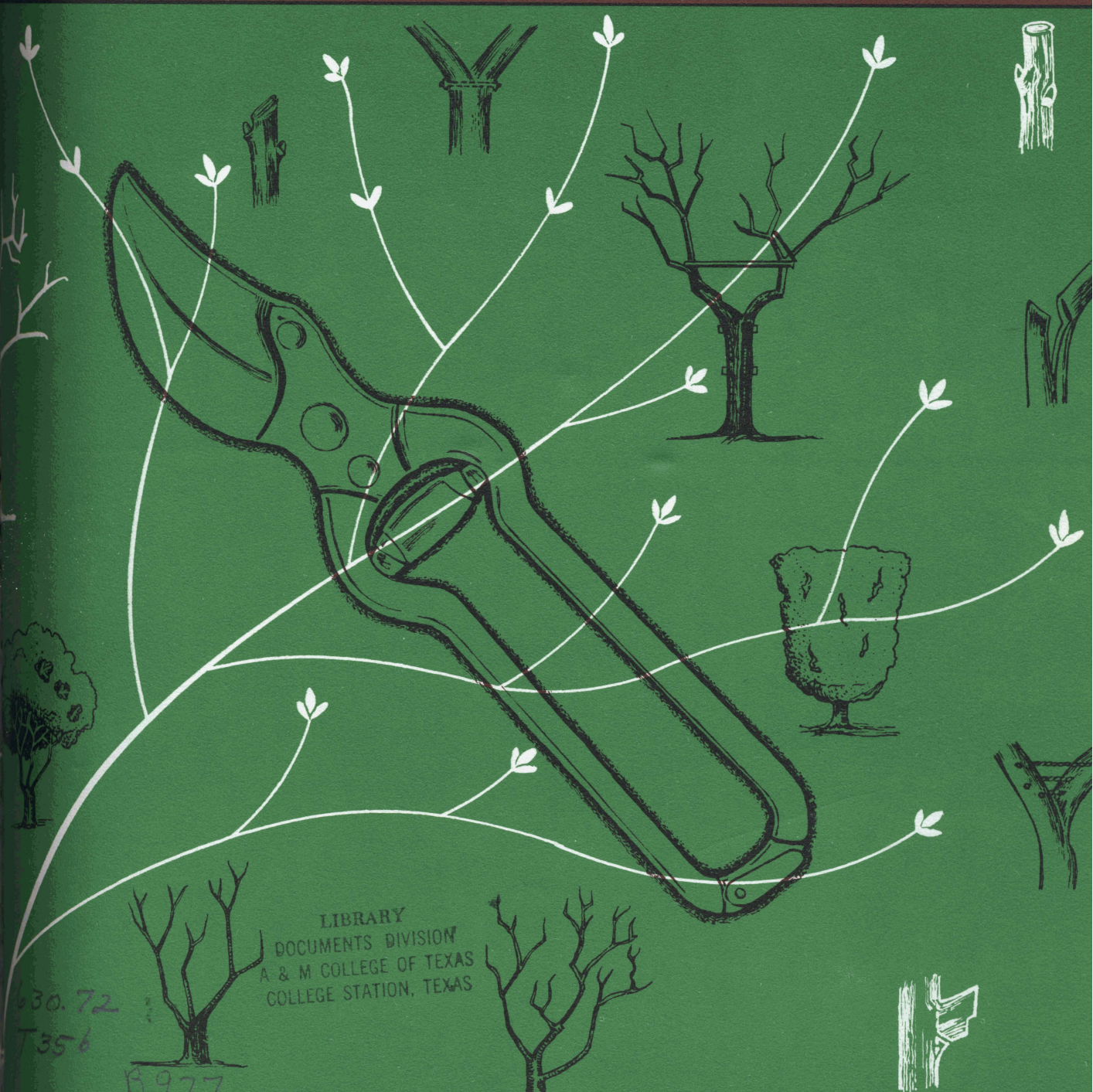


Modern PRUNING METHODS



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THE AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

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College Station, Texas

J. E. Hutchison, Director

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MODERN PRUNING METHODS

A. F. DeWerth

PRUNING PLANTS IS AN ART which can be acquired through learning certain basic principles and the exceptions to them, and through experience and close observation.

All new shoots on plants begin as buds. Sometimes these buds have been formed and have been dormant for a long time. They are located at the base of the leaf stalk in the axil where it joins the stem. Such buds are referred to as "axillary buds." They are visible on most ornamental plants. In other instances, buds may arise on the plant under the bark on the stems at any location, or they may occur later at the joint or node of the stem. Usually they are not visible at the time a pruning cut is made. These are referred to as "adventitious buds."

When a plant is pruned, new shoots are likely to begin near the point at which the pruning cut was made. The new stems produced by these shoots generally will grow in the same direction that the bud was pointing before the shoot emerged from it. How fast the new shoot will grow depends almost entirely on the nature and species of the plant and the severity of the pruning cut.

If you understand these factors, you can outline your pruning operations so that they will regulate the size, form and extent of growth on any ornamental plant.

You can use the trial and error method when accurate knowledge about pruning a plant is not available, but remember the simple rules of plant growth previously outlined, and prune in a *moderate* manner. Fortunately, most ornamental plants are able to recover rapidly from pruning. The new growth has a surprising way of covering and correcting most errors made by improper pruning.

REASONS FOR PRUNING

The cardinal rule to follow in pruning ornamental plants is the same as that which applies to fruit bearing plants: If you have no good rea-

son for pruning a plant, put the tools away without using them.

The purpose of pruning is to remove unwanted growth as outlined here in order of importance:

1. To remove dead wood or winter-killed growth.
2. To balance the amount of top or branch growth on a plant with the amount of root system at the time of transplanting. (This is especially true with rosebushes or other trees and shrubs moved with bare roots.)
3. To remove parts of plants that are injured seriously by diseases or insects.
4. To repair injuries to the plant by weather conditions, such as storms.
5. To rejuvenate older plants by removing older stems and branches to encourage vigorous new young stems to take their place.
6. To maintain or develop a desired size or form.
7. To produce more or better flowers and fruit.

PRUNING TOOLS

Pruning tools should be of high quality, sharp and well adapted to the job at hand. The essential pieces of pruning equipment appear in Figure 1.

Pruning shears come in sizes 7 to 9 inches long. If you plan to buy only one pair, select the heavier type because there will be less danger of straining or springing the cutting blades.

Pruning saws 18 to 26 inches long should be used to cut large tree limbs. Those 12 to 14 inches long are well suited for pruning most shrubs and small trees.

On certain shrubs, often entire stems of large diameter need to be cut off at the ground line. If you cannot use a pruning saw or the hand-pruning shears are not heavy enough to do this job, use

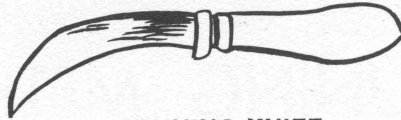
¹Head, Department of Floriculture and Landscape Architecture, The A&M College of Texas.



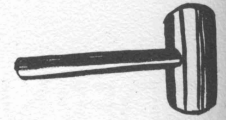
CHISEL



GOUGE



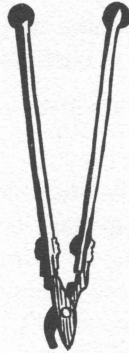
PRUNING KNIFE



MALLET



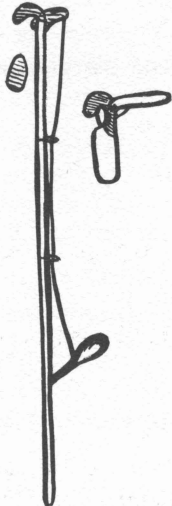
PRUNING SHEARS



LOPPING SHEARS



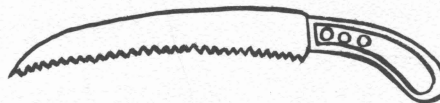
HEDGE SHEARS



POLE PRUNER



PRUNING SAW



ORCHARD SAW



TAPERED SAW



POLE SAW

Figure 1. Pruning tools.

lopping shears. These shears have handles 20 to 36 inches long, which provide good leverage on the cut. The cutting blades are strong enough to cut woody stems 1/2 to 1 1/2 inches in diameter. You will need hedge shears when hedges require shearing. Avoid using hedge shears for other pruning purposes.

PRUNING SHADE TREES

Although shade trees probably require less pruning than other groups of ornamental plants, at times pruning such trees is necessary.

When large trees are grown for shade, they also shade themselves, and sufficient sunlight is neces-

sary for the development of good foliage. Trees in stands of woodlands eventually prune themselves. Under cultivation, shade trees require removal of dead or diseased branches and, in some cases, branches that interfere with good plant growth and form.

Some pruning is necessary on shade trees for safety and for the health and beauty of the tree.

Corrective pruning sometimes is needed on young trees. This is done when the trees are young to prevent the formation of weak V-shaped crotches and limbs that might interfere with the future growth of more essential branches. If large trees do not receive this corrective pruning when they are young, it usually cannot be done satisfactorily in later years.

You can make cuts properly on large branches to avoid serious damage to the tree and to insure recovery. This procedure is shown in Figure 2.

Avoid topping large trees unless some serious damage makes it mandatory. Leave thinning and shaping large trees to an experienced arborist who knows the type of tree, its requirements and the proper time of the year to perform such operations.

The principal reasons for pruning large ornamental trees are health, appearance, safety and disease control.

PRUNING FOR HEALTH

Broken, dead or diseased branches need pruning to prevent the fungus that produces wood decay from penetrating into the part of the tree where these branches are attached.

Live branches often are removed to compensate for a loss of roots, and to permit more air and sunlight to penetrate and circulate through the other branches of the tree.

Branches that overlap and those that interfere with telephone and power lines are removed to prevent rubbing and eventual decay.

The branch stubs are removed to promote proper healing. Tops sometimes can be cut back to revitalize the tree if pruning has not been too severe.

This type of pruning, when done carefully and properly, can increase the general vigor of the tree by adjusting and supplying additional nourishment to the remaining parts.

Drastic pruning, such as that done following storm damage, which usually involves the removal of much potential leaf surface, may seriously affect the food supply and weaken the trees.

Removal of a large portion of the top of any tree may favor fungus and insect attack, and also increase the possibility of bark scalding due to sudden exposure of the tender tissues to strong sun rays.

The removal of many small branches is more desirable, therefore, than the removal of a few large ones. This reduces the amount of sunscald, makes the work less conspicuous and makes it easier to maintain the desired shape. Many small wounds will heal more rapidly than a few large ones.

The removal of dead or dying branches is one of the main reasons for pruning. Some of the principal causes of die-back are listed as follows:

1. Lack of proper or adequate plant nutrients.
2. Fungus, bacterial or insect attack.
3. Deficient or excessive moisture supply.
4. Toxic elements in the soil or atmosphere.
5. Damage to the root system.
6. Lack of air for the root system due to improper grading.
7. Lack of adequate air and sunlight in interior of the tree crown.
8. Mechanical injury to the trunk and branches.
9. Lightning and storm injury.

Dead wood resulting from any of these causes should be removed. The causes also should be eliminated or corrected whenever possible.

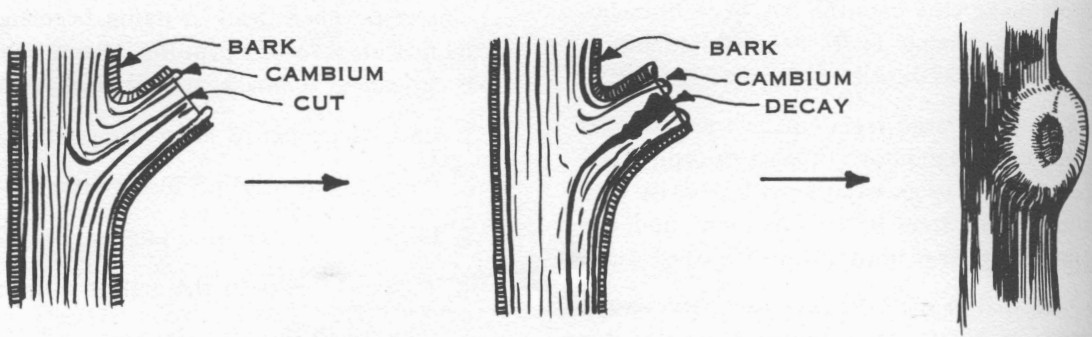
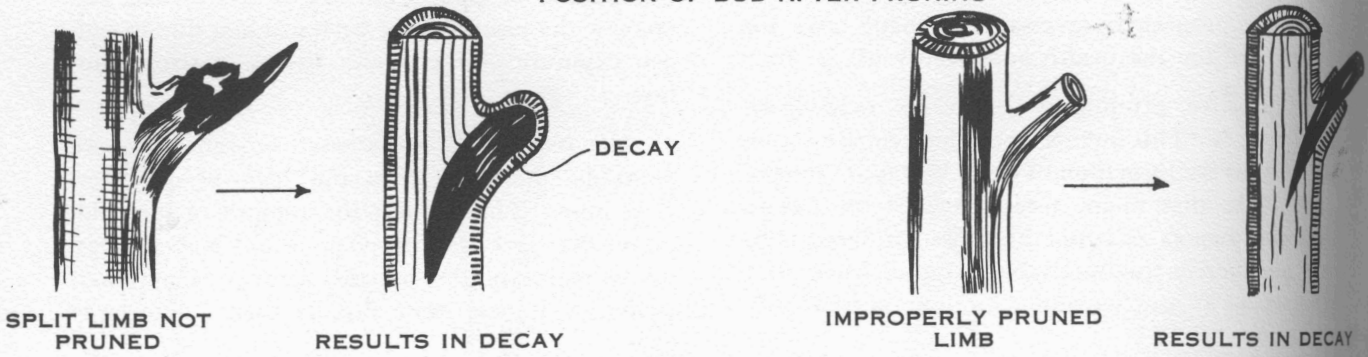
PRUNING FOR APPEARANCE

Pruning for appearance is one of the least important reasons and seldom is justifiable, except in formal plantings or to restore a normal shape to a badly misshapen tree. This usually results from storm or lightning injury.

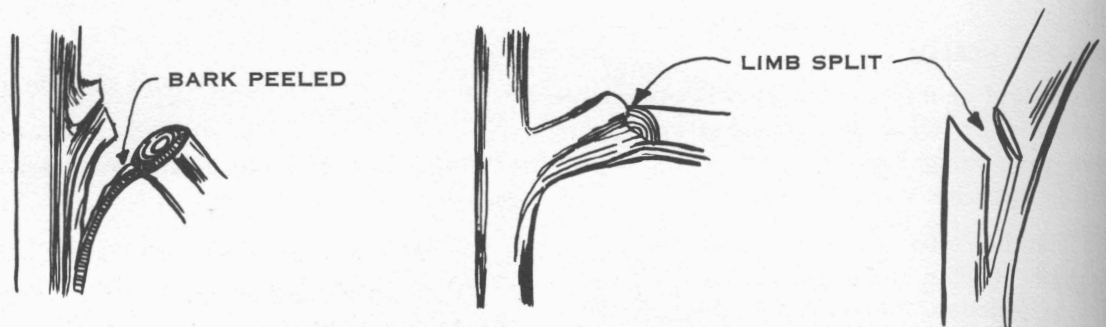
In pruning trees for formal effects, an excellent knowledge of landscape values and a good idea of the normal form of the tree being pruned are essential.



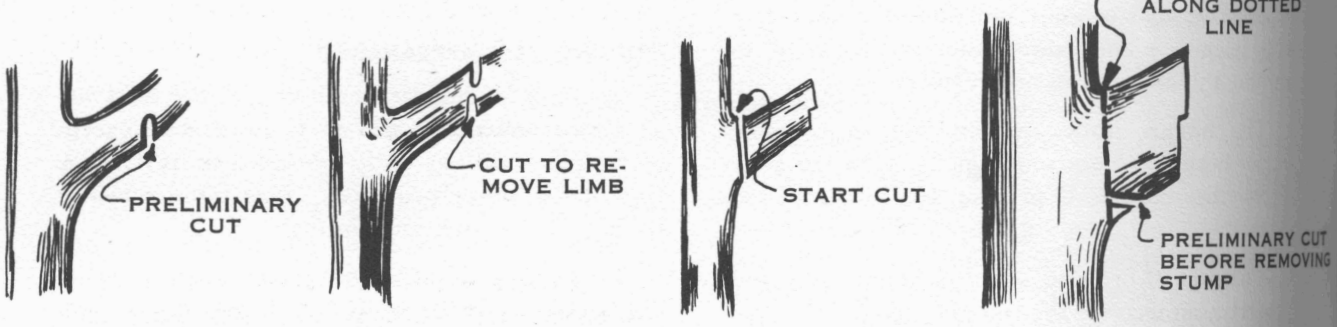
INCORRECT METHODS
POSITION OF BUD AFTER PRUNING



HEALING PROCESS OF IMPROPERLY PRUNED LIMB



LIMBS SPLIT FROM IMPROPER PRUNING



PROPER PROCEDURE IN PRUNING A LARGE LIMB

REMOVAL OF VERY LARGE LIMB

Figure 2. Incorrect and correct pruning methods.

PRUNING FOR SAFETY

Split, dead and broken branches are hazardous to life and property. This is greatest in public parks and on college campuses or city streets. Low-hanging live branches should be removed to a height of 10 to 12 feet when they interfere with pedestrian and vehicular traffic.

PRUNING FOR DISEASE CONTROL

When trees become only partially injured by diseases, pruning to prevent their spread usually is advisable. In such cases, the infected twigs and branches should be removed at least 3 inches below the point of visible infection.

Extreme caution should be used in this type of pruning so that the infection will not be spread by the pruning tools used.

Avoid pruning when the foliage is wet since parasitic organisms usually are spread by water or high humidity. Keep all pruning tools disinfected by dipping them in 70 percent denatured alcohol before each cut is made.

WHEN TO PRUNE

Trees may be pruned at any time. There are advantages and disadvantages in pruning during certain seasons, but the selection of the time to prune should depend principally on practical considerations.

Trees can be pruned into a desired shape best when they are in foliage. At this time the dead and diseased branches are seen more easily.

Spring is an excellent time for pruning large trees, because rapid healing of wounds occurs at this time. Trees such as maple and birch bleed profusely. They usually are not prevalent in Texas, but where they are grown, pruning should be done during the summer when they do not bleed as seriously.

Pruning methods for storm-damaged trees and for other reasons are illustrated in Figures 3, 4, 5, 6 and 7.

PRUNING ORNAMENTAL SHRUBS AND SMALL TREES

Pruning ornamental shrubs and small flowering trees depends on the growth habit and blooming characteristics of the plant. Some plants should

be pruned as soon as they have finished flowering in the spring and others should be pruned before growth starts in the spring.

Most shrubs and small trees which bloom during the spring produce their flowers on the growth that was made the previous year. If such shrubs are pruned early in the spring before they start the growth that is followed by the bloom, the greater portion of the flowering shoots are removed. All plants that fall into this group should be pruned only after they have finished blooming.

Shrubs and trees that bloom from early summer until fall usually form flowers on shoots that have been produced early in the same season. This gives them sufficient time to produce flowering stems from early spring until the time they flower. This group of plants should be pruned while they are dormant—any time during the winter except in areas of Texas where severe cold weather prevails. As a general rule, it is best to delay such pruning until February or March or until danger of late frost is past so that the growth stimulated by pruning will not be killed.

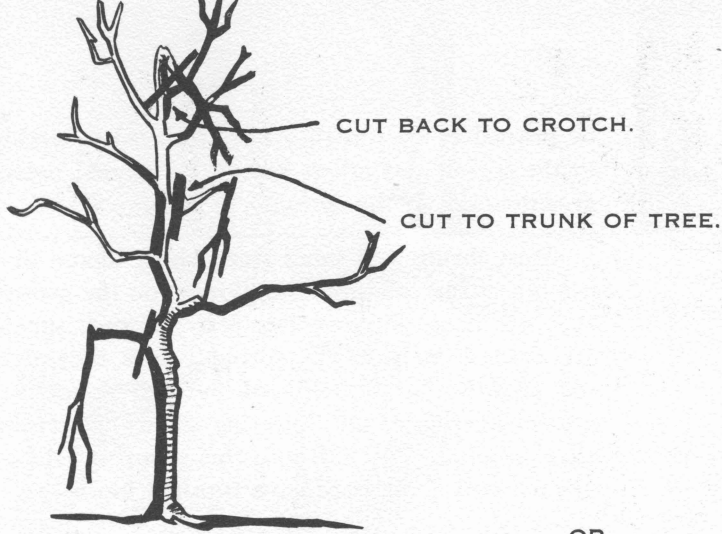
The extent of pruning to be done will depend on the type of plant being grown. Some plants should be pruned every year. Dead, diseased or insect-damaged growth should be cut out as soon as it is noticed, regardless of the time of year, to prevent its spread.

Plants such as buddleia, caryopteris, hydrangea, tamarix and vitex should be pruned back each year to a point just above the base of the previous years growth.

Spiraeas and other summer flowering shrubs that have similar growth habits should have many of the older stems removed at the ground. Small weak stems also should be removed in the same manner to allow the young vigorous stems to continue to develop the beauty of the shrubs. See Figure 8.

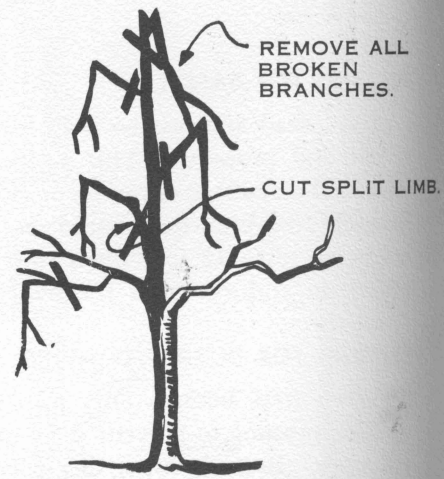
Spring blooming spireas, jasmine, lilacs, philadelphus, beauty bush and mock orange should be pruned immediately after they have finished flowering.

Shrubs grown for their showy fruit, such as pyracantha, hollies, barberries, cotoneasters and elaeagnus, should be thinned lightly during the dormant season when needed, and old or weak

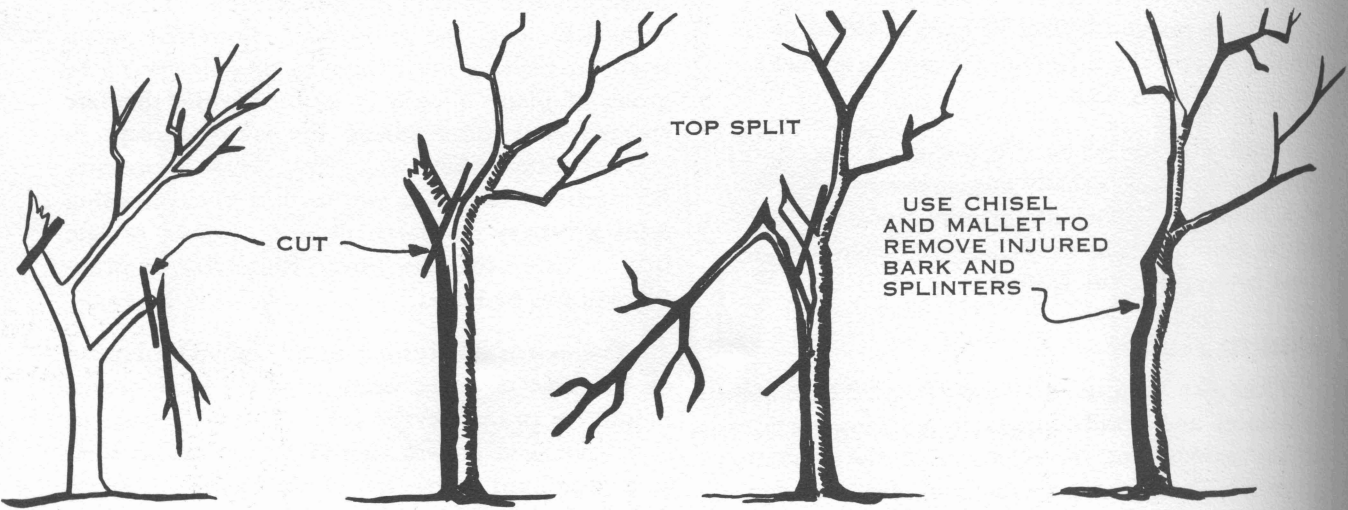


TREE WITH LEADER AND FEW SIDE BRANCHES BROKEN

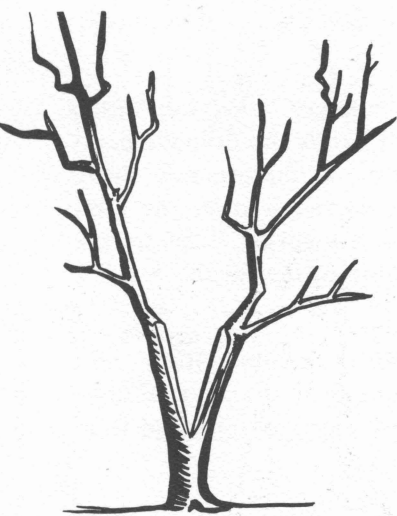
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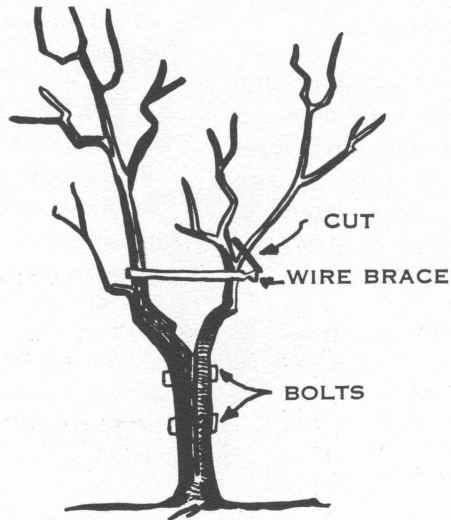
TREE WITH LEADER AND MOST OF SIDE BRANCHES BROKEN



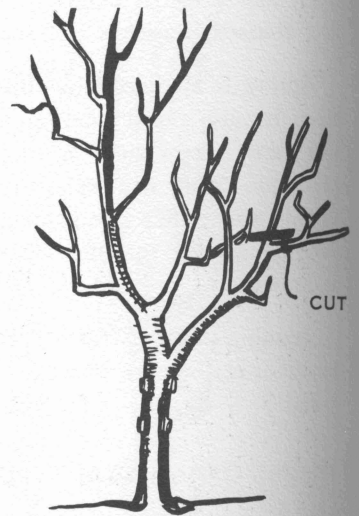
TREES WITH BROKEN TOPS



TREE WITH SPLIT TRUNK



TREE BRACED



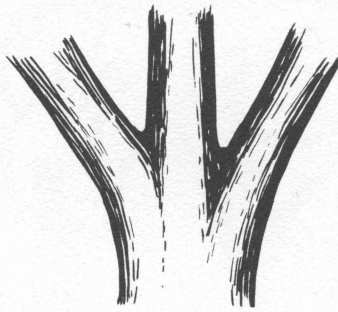
TREE AFTER SPLIT TRUNK HAS HEALED

Figure 3. Pruning methods for storm-damaged trees.

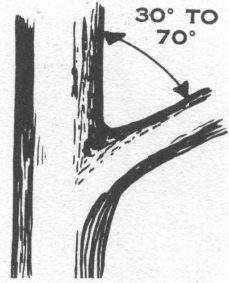
5° TO 10°



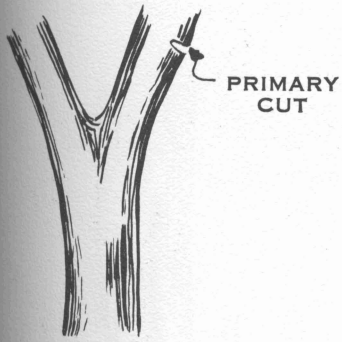
WEAK CROTCH
TOO NARROW



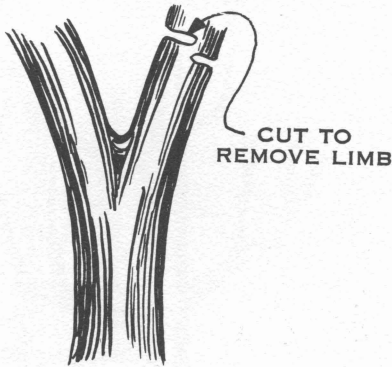
MIDDLE CROTCH
CROWDED



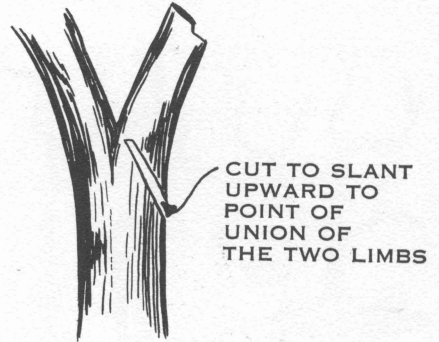
EXCELLENT
ANGLE



PRIMARY
CUT

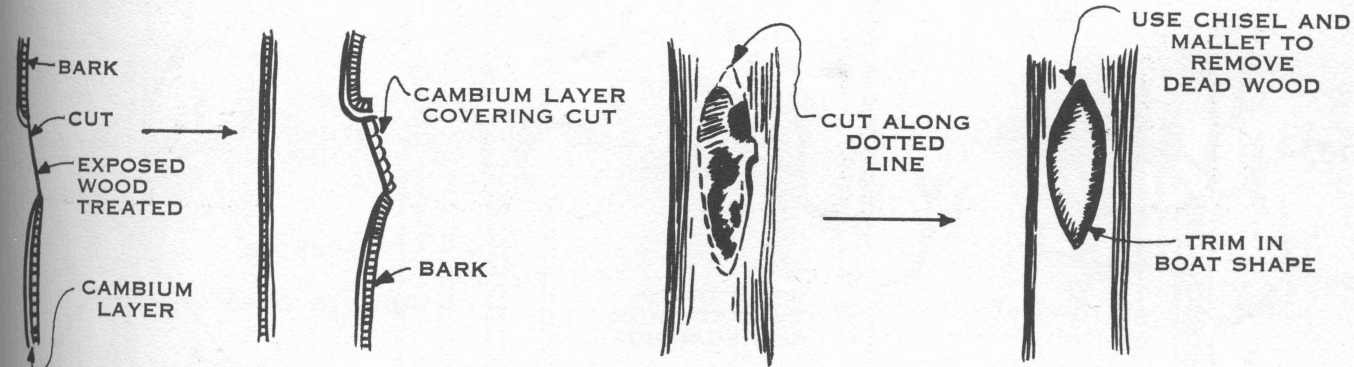


CUT TO
REMOVE LIMB



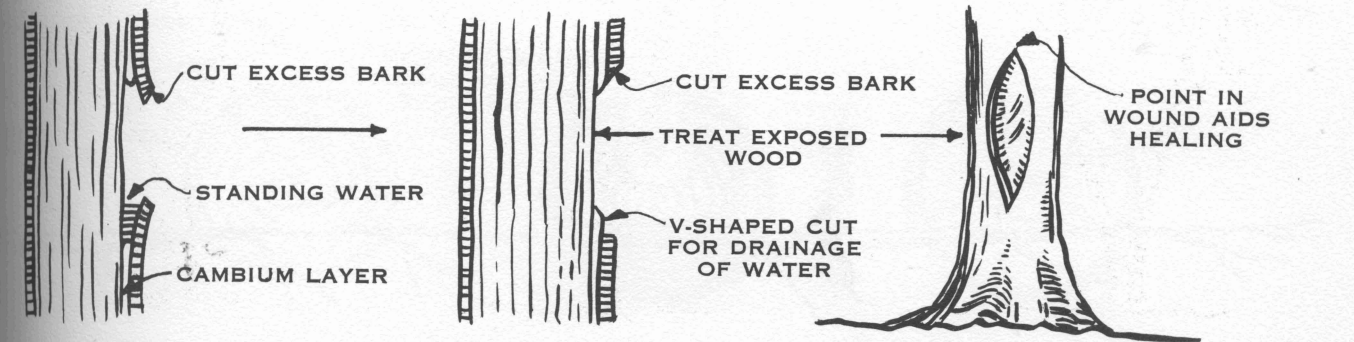
CUT TO SLANT
UPWARD TO
POINT OF
UNION OF
THE TWO LIMBS

PROPER PROCEDURE IN PRUNING FOR CROTCH



HEALING PROCESS OF CUT

TREATMENT OF TREE WOUND



TREATMENT OF TREE WOUND

Figure 4. Pruning methods.

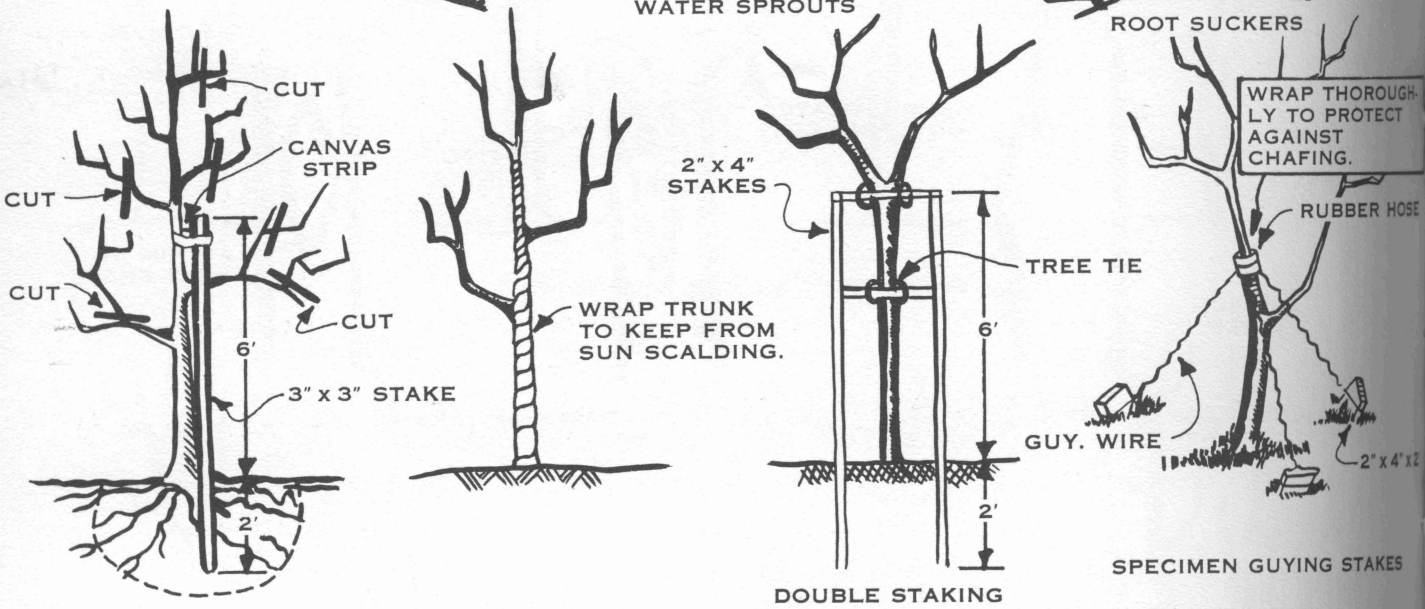
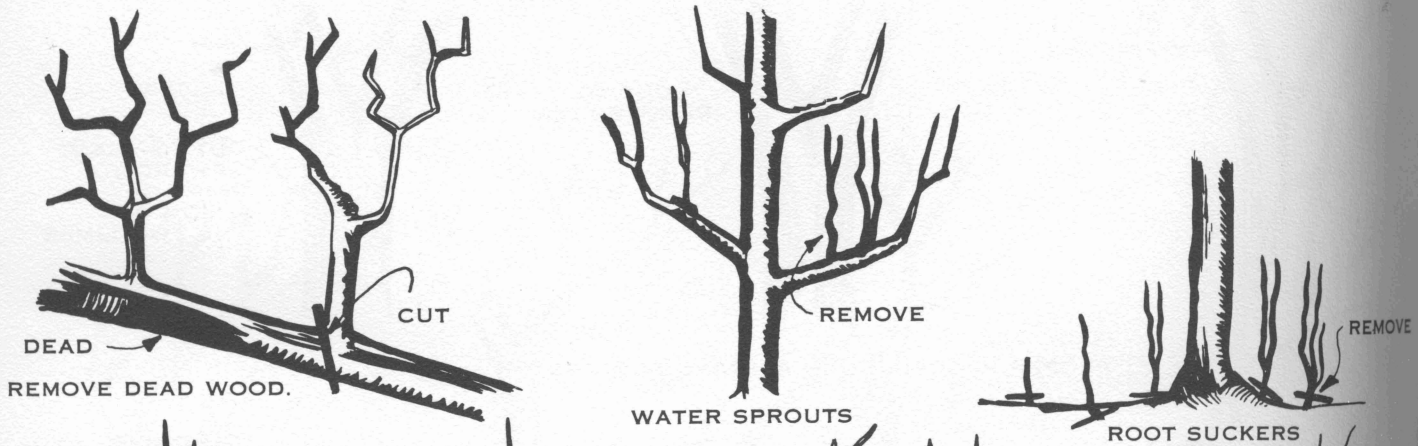
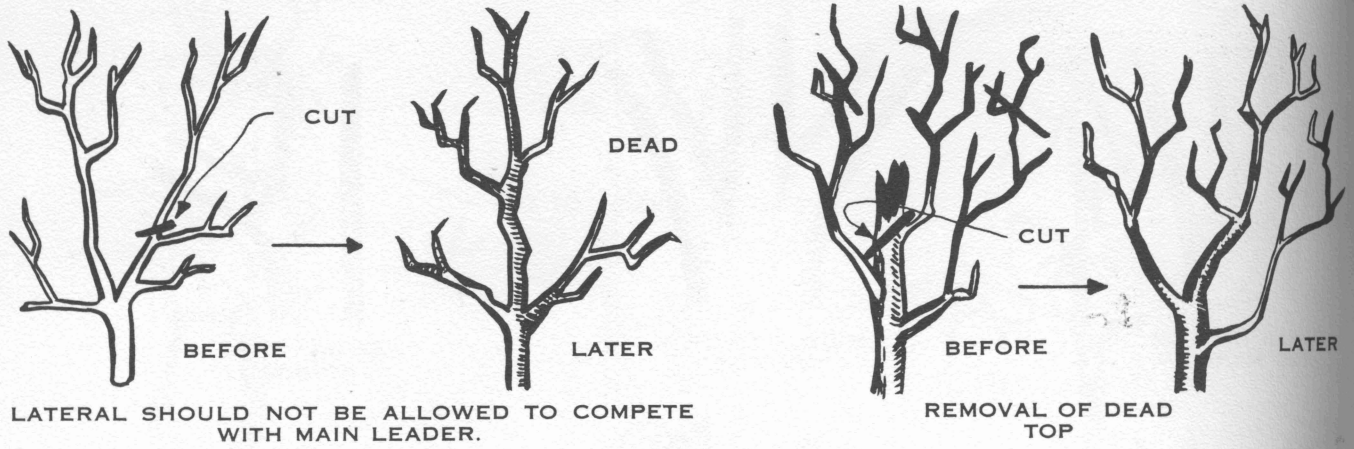
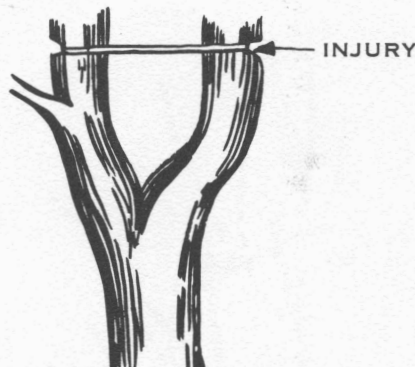
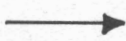


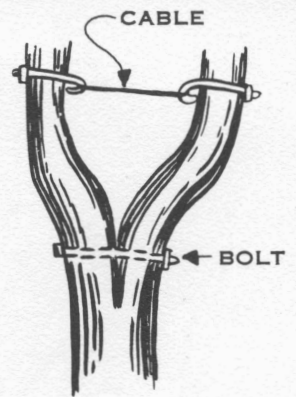
Figure 5. Pruning and staking of transplanted trees; pruning of damaged roots.



USE OF BAND OR WIRE FOR TREE BRACE

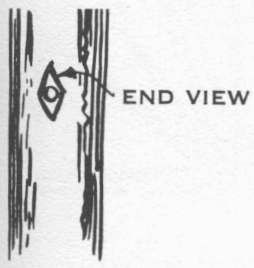


RESULT OF USE OF BAND

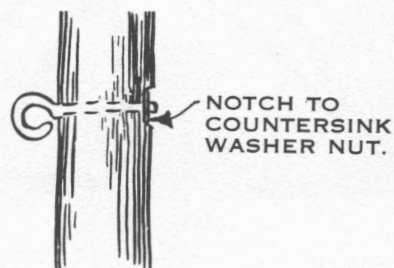


POOR METHOD

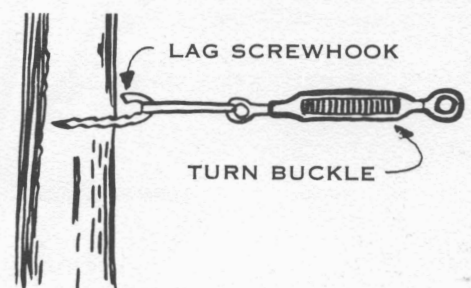
RECOMMENDED METHOD



END VIEW



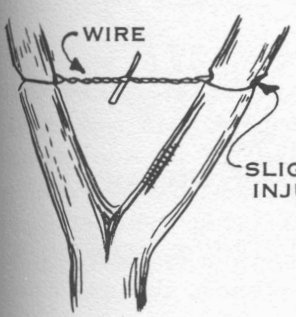
NOTCH TO COUNTERSINK WASHER NUT.



LAG SCREWHOOK

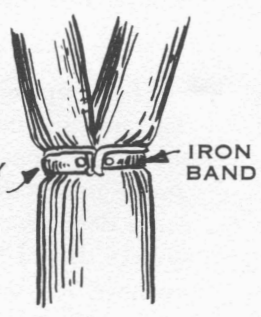
TURN BUCKLE

LAG BOLT INSTALLATION



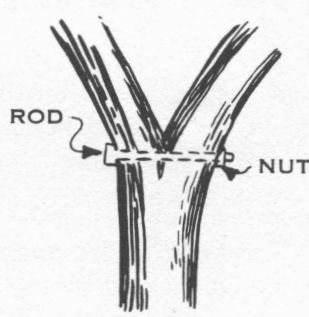
WIRE

SLIGHTLY INJURED



IRON BAND

WRONG BRACING METHODS

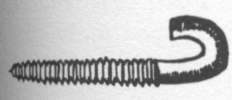


ROD

NUT

THREADED TREE ROD

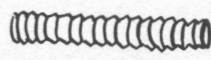
OTHER METHODS OF BRACING FOR WEAK CROTCHES



LAG SCREWHOOK



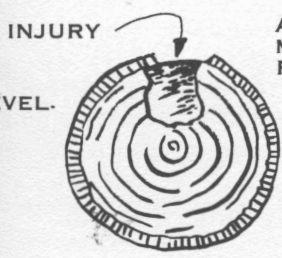
TURN BUCKLE



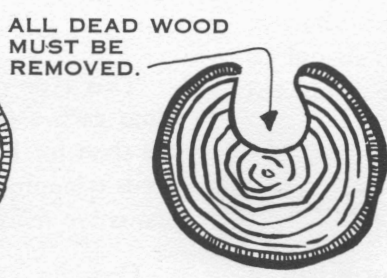
THREADED TREE ROD



LAG SCREW BOLT

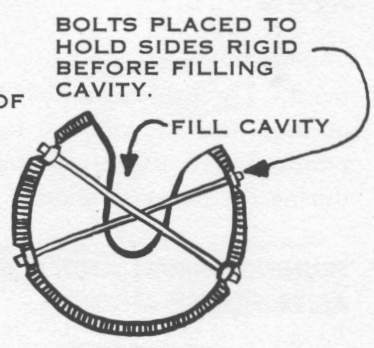


INJURY



ALL DEAD WOOD MUST BE REMOVED.

PAIN
T WALLS OF
CAVITY
WITH
TREE
PAINT.



BOLTS PLACED TO HOLD SIDES RIGID BEFORE FILLING CAVITY.

FILL CAVITY

CAVED AREA DEVEL-
ED FROM BARK
RY.

CAVITY WORK

Figure 6. Tree bracing and treatment of wounds.

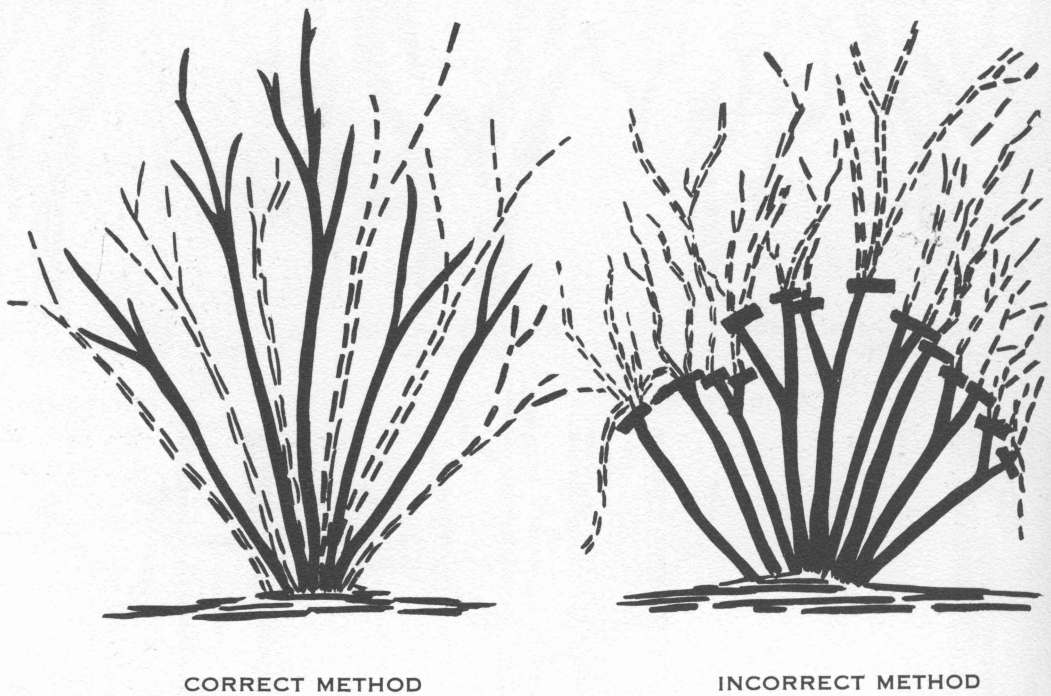


Figure 7. Many shrubs should be pruned by thinning out rather than heading back.

stems should be removed. This group usually will go several years without any pruning beyond that needed to keep them neat in appearance.

Small flowering trees, such as redbud, dogwood, fringetree, hawthorn, koelreuteria, laburnum, flowering crab apples and magnolias, which often are trained and grown as large shrubs, require little if any annual pruning. The exception is when the natural shape of these plants needs to be maintained by occasionally removing weak branches or those that compete with the central leader in the tree or shrub. The central leader should never be cut.

Sucker growth should be removed from the trunks. Branch shoots that grow up into the tree or those that are rubbing together also should be removed. All of this pruning should be completed during the dormant season.

PRUNING SHRUBS AND TREES AFTER TRANSPLANTING

When woody plants are dug without a ball of soil around the roots they are said to be dug "bare-root." When this method is followed much of the root system is cut off during the digging process.

To compensate for this loss of roots, some of the top area should be removed. In most cases, removal of about one-third of the top growth is ample unless the root system has been more seriously damaged than is usually the case. The top growth should be removed in the same manner as outlined for annual pruning, depending on the type of plant.

Trees and shrubs transplanted from containers or dug with a ball of soil wrapped in burlap require little pruning at the time of transplanting.

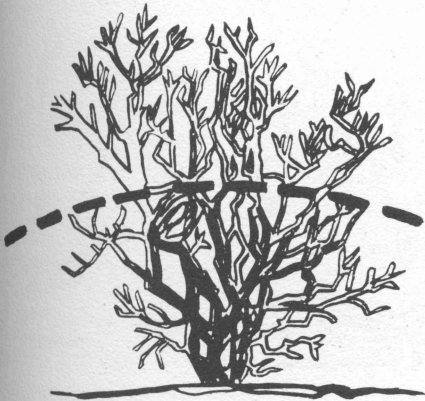
TRIMMING HEDGES

When formal hedges are 75 to 100 feet or more long they may be sheared with electric hedge shears within 45 minutes to an hour.

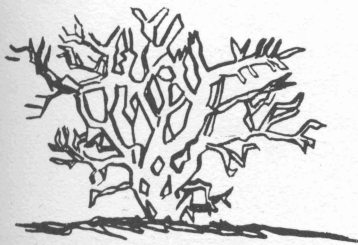
This type of hedge may require several clippings each season, but the trimming time may be less than for hedges of a different type plant that needs trimming only once or twice a season. Such plants are more difficult to trim.

Consider carefully the shapes to which your hedges are to be trimmed. A rounded or more pointed top is preferred since a flat-topped hedge is more difficult to maintain and clip and is more

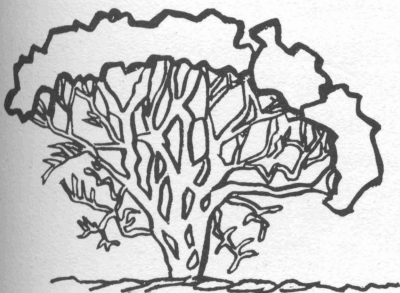
IMPROPER METHOD OF PRUNING CRAPE-MYRTLE



1. CUTTING ON LINE SHOWN BY DASHED LINE IS TOO OFTEN DONE WHEN PRUNING SHRUBS.

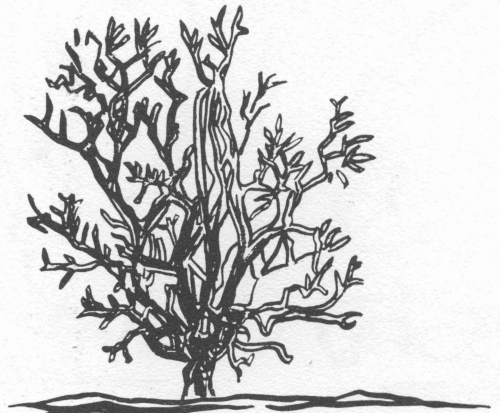


2. SAME PLANT AFTER BEING PRUNED AS INDICATED ABOVE. ALL SUCKER GROWTH REMAINS.

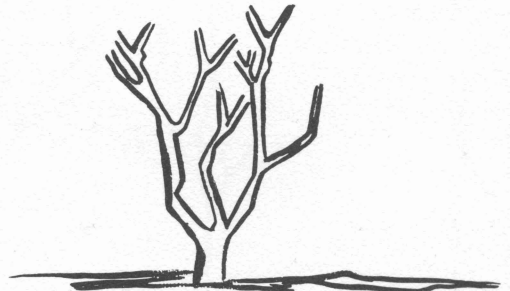


3. FINAL RESULT: BEAUTIFUL NATURAL SHAPE OF SHRUB IS LOST AND BLOOM IS SPARSE AND INEFFECTUAL.

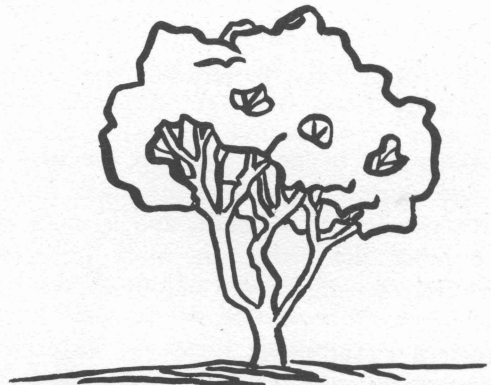
PROPER METHOD OF PRUNING CRAPE-MYRTLE



1. SHRUB BEFORE PRUNING. NEEDS ALL WEAK AND DEAD BRANCHES REMOVED.



2. SAME SHRUB AFTER REMOVAL OF WEAK AND INTERFERING BRANCHES AND WITH BASE SUCKER GROWTH REMOVED.



3. FINAL RESULT: BEAUTIFUL NATURAL AND DISTINCTIVE FORM OF PLANT RETAINED. VIGOROUS GROWTH AND PROLIFIC AND EFFECTIVE FLOWERING.

Figure 8. The general pruning procedure illustrated above for pruning crape-myrtle also applies to many other large shrubs or small trees of similar structure.

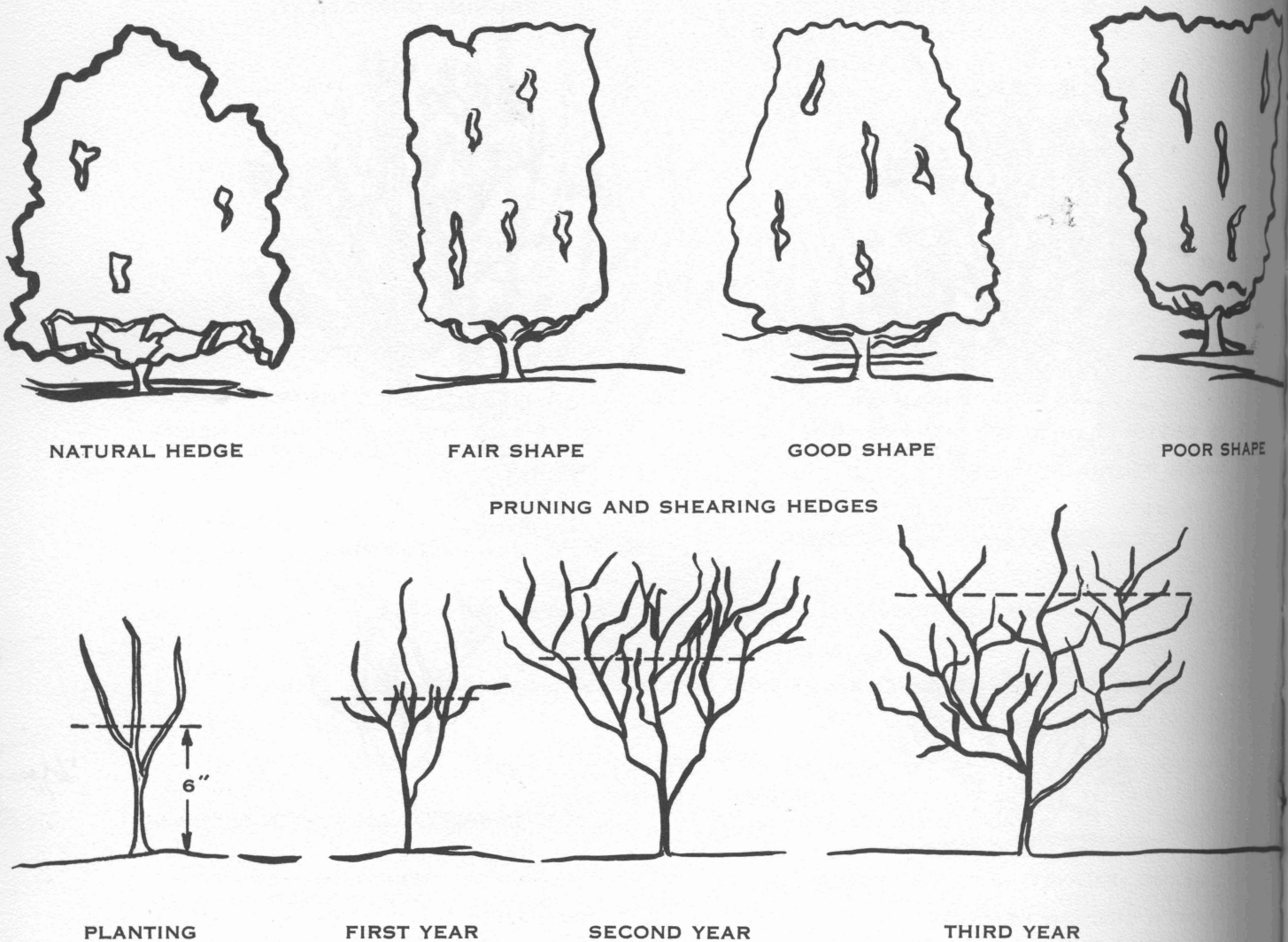


Figure 9. Starting a hedge.

easily broken down by weather and other causes. (Figure 9)

When the hedge is wider at the base than at the top, more light reaches the lower foliage and it remains in better health and is more compact. The taller the hedge the more important this attention to hedge shape becomes.

PRUNING EVERGREENS

Most narrow-leaved evergreens can be improved in appearance by occasional pruning or shearing. Plants such as the tree forms of redcedar and Chinese juniper and the pyramidal forms of arbovitae can be sheared with hedge shears about the first or second week in April in the warmer sec-

tions of Texas, and about the first or second week in May or June in the colder areas.

The spreading forms of junipers should have the tip ends of the growth trimmed each spring. This tends to hold the plants in check and induces a compact growth habit.

For the narrow-leaved evergreens with coarser foliage, such as pine, little pruning is required. When pruning any of the narrow-leaved evergreens, such as cypress, juniper, cedar and arbovitae, never cut into the bare wood behind the foliage on the tips, since few buds are formed on these twigs and the plants may be damaged beyond repair.

Root pruning often is practiced on both narrow-leaved and broad-leaved evergreen ornamental plants. This specialized type of pruning is needed when top growth begins in the spring. This can be done best in the home garden by using a sharp spade or sharpshooter thrust vertically into the soil around the plant just inside the rim of the spread of the branches. This operation cuts off the roots cleanly and tends to keep the roots of the plants in a confined area.

Be sure to provide sufficient nutrients and moisture for this restricted root area during the following growing season to prevent drouth injury in the ensuing dry summer which prevails in most of Texas.

Broad-leaved evergreens, such as gardenias, camellias, azaleas and photinias require less pruning than the narrow-leaved types. Remove old flower clusters as they fade and complete all such pruning before July 1. When plants become old and straggly, cut them back to 6 or 8 inches from the ground before spring growth begins. Such pruning will stimulate the growth of new wood from the base of the plant. Many gardeners prefer to remove only about a third of the branches at one time and retain the general contour of the plant.

Many narrow-leaved evergreens in Texas show a browning effect in the fall. This fall browning is a natural pruning process.

The amount of browning on various plants from season to season may vary considerably. This is a natural shedding of the older leaves or branches and is comparable to the dropping of leaves by deciduous plants. It occurs principally on arbovitae and cypress trees and on some pines, especially in the warmer areas of the State. Extensive periods of hot dry weather also may contribute to the loss of leaves on narrow-leaved evergreens.

PRUNING ROSES

Rose plants need pruning to tidy up their appearance, to control size and to improve their health, growth habits and bloom.

Pruning methods vary according to the type of rose plant. Frost injury "wood" on any rose plant should be removed to the first green bud or to a point where the bark is healthy and the pith within the stems is firm and not granular or brown.

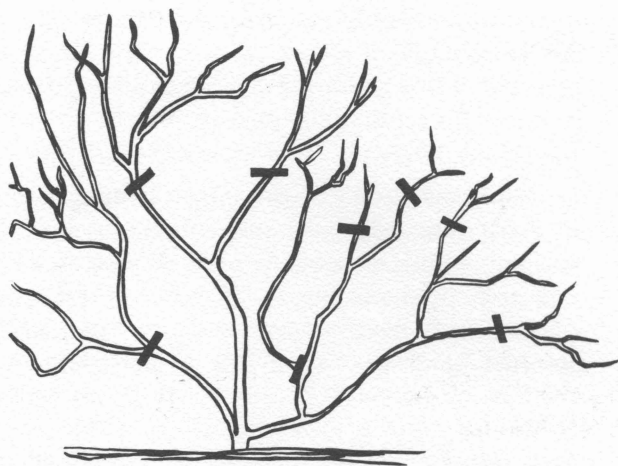


Figure 10. Pruning young climbing roses.

Late winter or spring pruning varies considerably in Texas, due to a wide range of seasonal differences. It should be done, however, as early as settled spring weather permits the buds on the plants to expand. Do not delay this pruning until buds have fully expanded or the rose plants have started into growth.

Climbing Roses

"Climber" is a term applied without distinction to slender-caned ramblers such as Dorothy Perkins and heavier caned, large-flowered varieties such as Hercules and Paul's Scarlet.

Ramblers on fences and walls usually can be left with little or no pruning except the removal, at any time, of canes that grow beyond desired limits, of dead canes or those that are old and have ceased to be productive.

It is important to renew the vigor of the plant by removing the old canes since the most productive and finest blooms on ramblers are produced on canes that arose from the bottom of the plant the previous year. Some of the old canes can be taken out soon after flowering or when the new growth is 4 to 6 feet long.

The large-flowered climbers having one or a few canes from near the bottom of the plant may require little or no spring pruning except to remove dead wood, spindly twigs and side shoots.

Climbing hybrid-teas and most large-flowered climbers that tend to be repeat bloomers during the growing season look best when old blooms are cut off just above the first bud in the axil of a leaf. In most cases, this is at the first 5-leaflet leaf that

occurs below the flower. These branches may be cut back more, however, without damage to the plants if this practice is required to shape them.

Hybrid-tea Roses

Much controversy exists among home gardeners over pruning hybrid-tea roses high or low in the spring. Pruning these plants to 1 foot or less in any area produces lower spreading or branching plants which never appear leggy or open. Since the best blooms are produced on new canes from the base of the plants, it is better to prune back all hybrid-tea roses 6 to 12 inches from the ground each spring when the buds begin to swell. (Figure 11)

Grandiflora Roses

Two of the best-known varieties of grandiflora roses are Princess Elizabeth and Buccaneer. These large-flowered, cluster-blooming varieties can be pruned like hybrid-teas or can be given almost no spring pruning except the removal of small twigs or laterals.

Floribunda Roses

Floribunda roses are variable in growth habit and size of plant. Their prime objective is the production of profuse bloom. A minimum of pruning is necessary, except to force stronger canes by pruning weak plants to about 3 inches

above the ground. Under most Texas conditions, it usually is desirable to prune back about one-third of the canes on these plants each year to force new vigorous canes.

Polyanthas and Small Floribunda Roses

Pruning polyanthas and small floribunda rose plants is a matter of preference, since the amount of pruning practiced other than the removal of twiggy branches has little effect on plant size, quality or quantity of flowers.

Hybrid Perpetuals

Hybrid perpetuals are strong growers and need to have several canes of each plant cut back closely to the ground each year to induce new canes to grow from near the base. Otherwise, they are pruned the same as hybrid-tea roses.

Species Shrub Roses

Most species roses are woody shrubs that grow 1 to 10 feet tall. Since this is their growth habit, they should be pruned the same as other flowering shrubs, such as spiraeas or honeysuckles.

Tree Roses

Tree roses are produced by budding plants on a hardy understock such as is practiced with hybrid-teas, except that the bud of the desired variety is placed at a height of 2, 4 or more feet on the

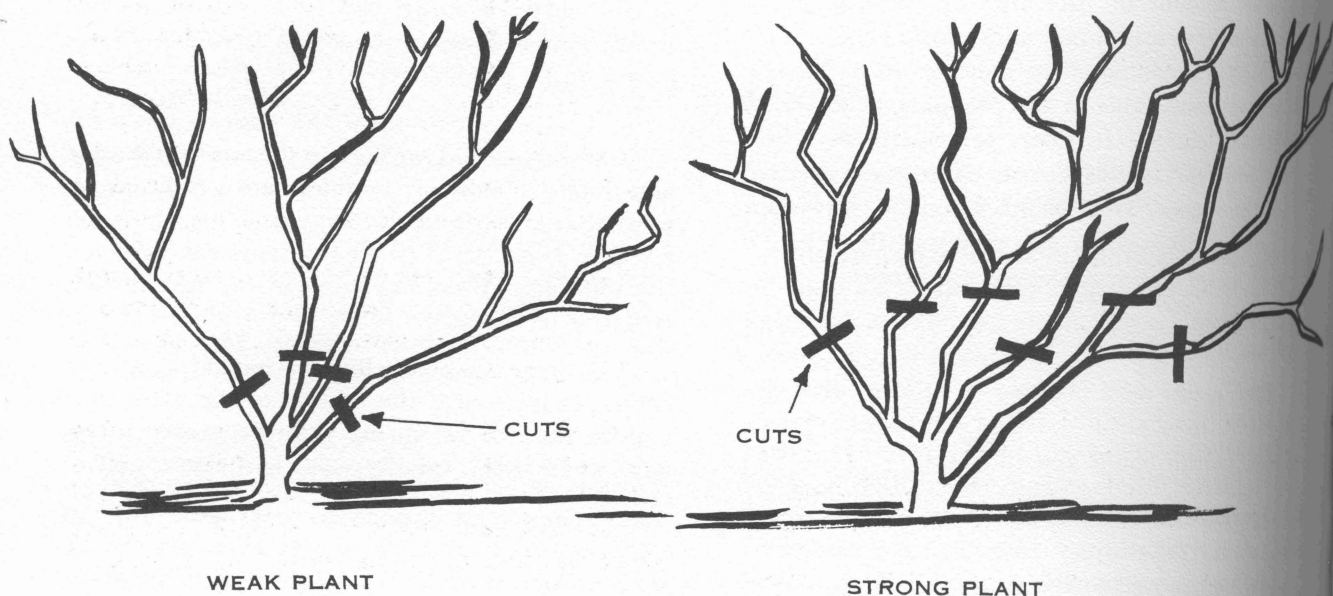


Figure 11. Pruning hybrid-tea roses.

2 or 3-year-old stem of some variety or species that makes strong large canes, such as *Rosa rugosa* or *Rosa nutkana*.

In most areas of Texas, tree roses must be covered by one of the various methods used. When spring arrives and the covering is removed, cut the top ends of the branches to healthy green wood and do not leave more than three buds on any branch.

Pruning "Bull Canes" on Roses

Some canes starting at the base of bush roses often will grow exceptionally strong and tall. Such canes tend to dominate the plants and are called "bull canes." When these canes are about 15 inches tall pinch or cut the tip back about an inch or two. This will tend to force lateral branches on this cane and gives more strength to the remainder of the plant. If this pruning is not done, these canes will grow too tall and produce a cluster of mediocre flowers.

Pruning Rose Plants for Transplanting

Potted or container-grown rose plants need no pruning at transplanting time. Packaged and dormant rose plants may have been pruned by the nurseryman. If not, the plants are more certain to grow if the amount of cane exposed to drying and the number of buds or "eyes" available for growth are reduced to 3 or 4 inches above the bud union of the plants.

PRUNING METHODS

Regardless of instructions and diagrams given, each gardener will learn more about pruning in his own garden if he will observe closely each plant, its habit of growth and its blooming characteristics.

Pay particular attention to the arrangement of the buds because these determine the type of growth that you can expect after pruning.

Among the trees and shrubs commonly grown in Texas gardens, there are two types of bud arrangements on the twigs and branches. In a general way, these bud arrangements are largely responsible for the typical growth habit of the plant.

Buds have an alternate or opposite arrangement on the twigs and most plants will have buds that occur alternately along the stems.

A plant which has alternate buds usually will be rounded, pyramidal, inverted pyramidal or columnar in shape. Plants having opposite buds rarely assume any form other than that of a rounded tree or shrub with a rounded crown.

The position of the last pair of buds left on any stem always determines the direction in which the new shoot will grow. Buds on top of the twig probably will grow upward at an angle. The bud on the side of the twig will grow outward at an angle, and to the side on which it is directed. (Figure 12)

On plants with opposite buds, when the pruning cut is made to a pair of buds in a lateral position, both buds often will grow. (Figure 13)

Observation of the arrangement of buds and the care used in selecting the terminal bud to be left on the plant is of the utmost importance in developing shapely plants. Careful selection of terminal buds also can reduce much pruning in the future, if you are careful not to direct the bud and its potential shoot toward another branch where there is insufficient light for good growth or the possibility of crossing and chafing other branches.

There is no standard method of pruning woody plants. On large shade trees, the most common practice is to start pruning operations in the upper portions of the tree and work downward.

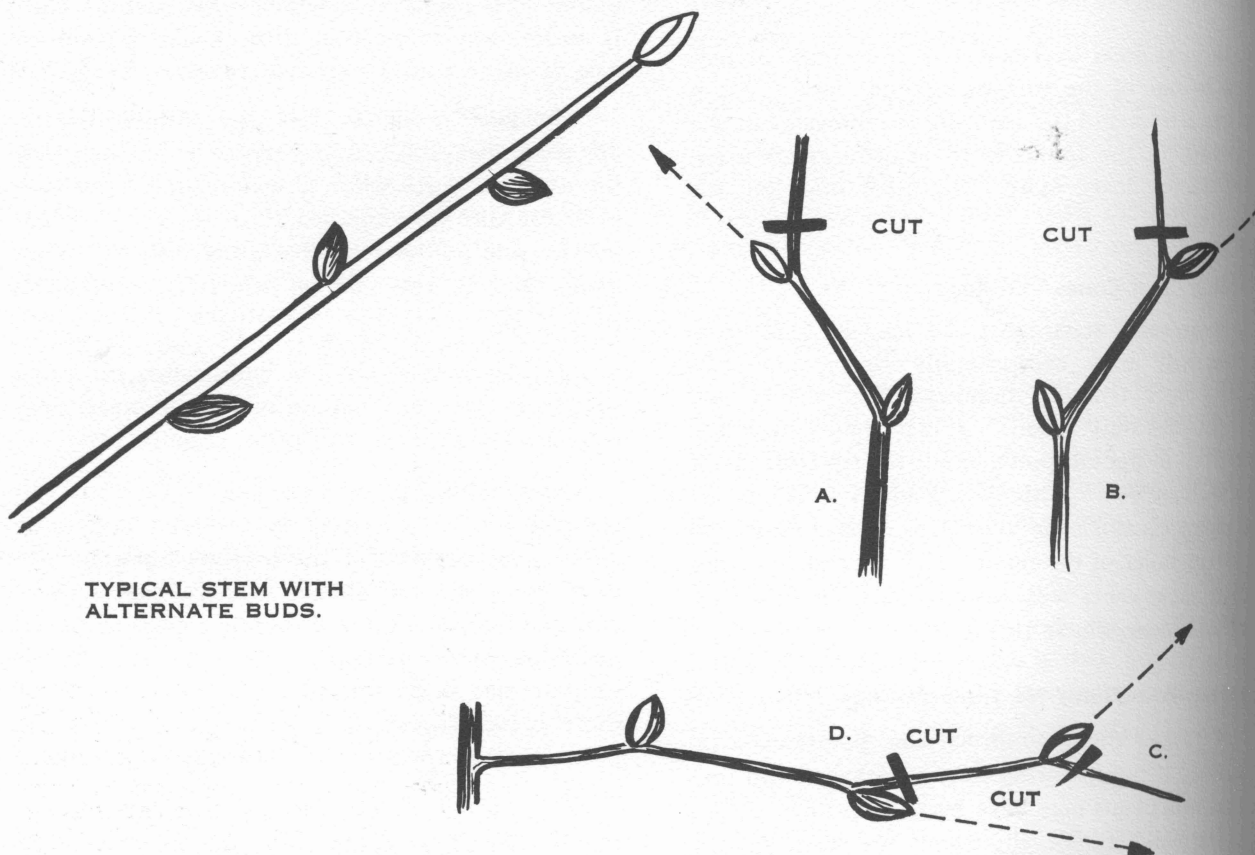
It is much easier to shape the tree properly by this method and it also saves time in clearing the pruned branches from the lower portions of the tree, should they become lodged there. Remove dead, broken, insect and fungus-infected branches.

Branches that interfere with each other also should be removed. This includes small branches that may become undesirable within a few years.

Make clean cuts, as nearly flush as possible with the branch that is to remain. Cut dead branches back to a healthy crotch so that the final cut is surrounded by healthy tissue.

Include the treatment of the bark on the trunk and branches in your pruning operations. Dead bark areas should be cut to healthy tissue and old wounds not healing properly should be recut and shellac and wound dressing should be applied.

Methods for shaping the final cuts and removing large branches are shown in Figures 3 and 4.



TYPICAL STEM WITH ALTERNATE BUDS.

AFTER PRUNING, DIRECTION OF GROWTH IS DETERMINED BY POSITION OF BUD DIRECTLY BELOW CUT.

SIDE VIEW OF ALTERNATE BUDDED BRANCH. CUT AT "C" ENCOURAGES GROWTH OUT AND UP. CUT AT "D" ENCOURAGES HORIZONTAL GROWTH, RARELY DOWNWARD.

A. B. TOP VIEW OF ALTERNATE BUDDED BRANCH SHOWS PRUNING CUT TO DIRECT GROWTH TO RIGHT OR LEFT SIDE.

Figure 12. How to prune typical stem with alternate buds.

Root Pruning

Whenever possible, it is desirable to root-prune certain types of trees and shrubs for transplanting a year or two before they are moved. This is especially true of native plants to be collected from the woods or from pastures.

This practice develops fibrous roots near the base of a sparsely rooted plant and reduces the shock of root loss at the time of transplanting.

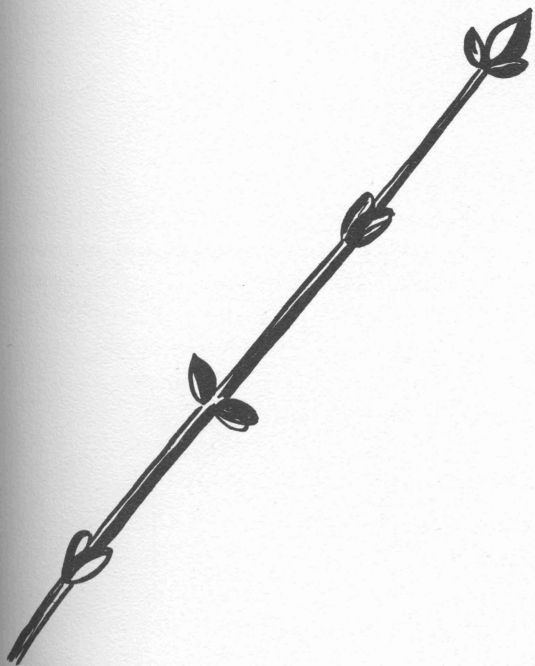
Root pruning is done best at least one full growing season before the moving operation. The best time to do this is in early spring because, in most cases, roots make their best growth during this period.

On small trees, shrubs and evergreens, you can root-prune with a sharp spade in a circle around the stem. The diameter of the circle will vary with the size of the plant, its rooting characteristics, the type of soil and the size of the earth ball to be removed with the plant.

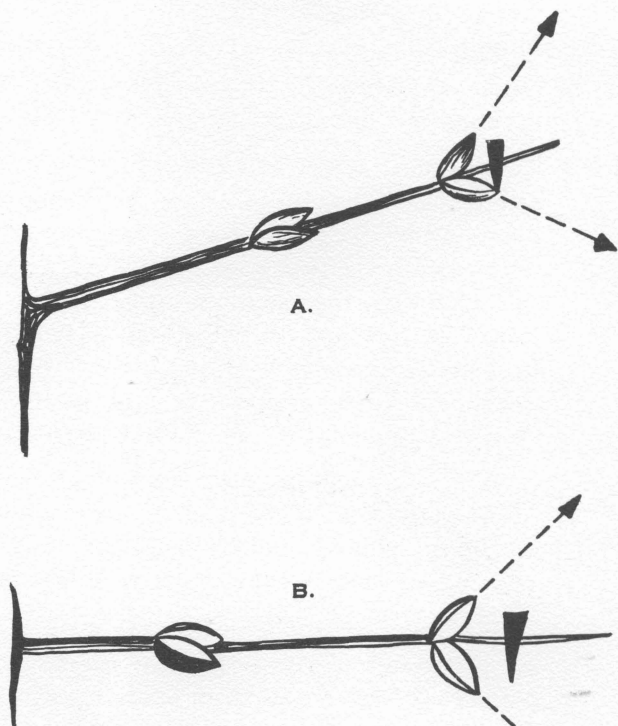
As a general rule, this circle should have a ratio of 10 inches of diameter to every inch of stem or trunk diameter on the plant.

Dehorning

Dehorning is a practice which involves drastic cutting back of the larger limbs of a tree. This completely disfigures the tree by removing the



TYPICAL STEM WITH OPPOSITE BUDS. EACH PAIR OF BUDS USUALLY ARRANGED AT RIGHT ANGLES TO PAIR ABOVE THEM.



A. SIDE VIEW OF OPPOSITE BUDDED STEM. BUDS IN VERTICAL PLANE. TOP BUD PRODUCES MOST VIGOROUS SHOOT IN OUT AND UP DIRECTION.

B. TOP VIEW OF OPPOSITE BUDDED STEM. BUDS IN HORIZONTAL PLANE; BOTH BUDS USUALLY GROW AT EQUAL RATE IN HORIZONTAL PLANE.

Figure 13. How to prune typical stem with opposite buds.

normal canopy and eventually may lead to serious branch decay which begins at the severed ends.

The bark is exposed suddenly to the full rays of the sun and may scald badly.

This practice must be used, however, where there is considerable dying-back of the branches due to storm damage, severe insect or disease attack, or when a reduced root area cannot support such a large canopy.

Many detrimental after-effects may be avoided by taking certain precautions. Follow the various cutting practices shown in Figures 3, 4 and 5.

Evergreen Trees

The periodic pruning required on deciduous trees usually can be eliminated on evergreens. When such pruning becomes necessary, the same rules should be followed.

The main objective in pruning evergreens is to produce a more compact or bushy plant. Pruning the growth at the ends of young shoots forces the plant to make new growth along the branches.

All narrow-leaved evergreens cannot be pruned the same way nor at the same time. The method used depends on the type of growth.

Pines and spruces make only one growth during the year and are best pruned when the growth is soft.

Most other evergreens, including the arborvitae, juniper, cypress and falsecypress, continue to develop growth during the entire growing season. Trimming of these types may continue through August, although June or July pruning is preferable, since the new growth will cover the cuts before the end of the growing season.

TREATMENT OF WOUNDS

Pruning operations often are performed without careful treatment and care of wounds. This is an important consideration in the case of trees.

All stubs or lips of wood should be removed from large wounds, and they then should be shaped into a pointed ellipse to aid rapid callus formation which is the first stage of healing. Following this operation, the cambium (the region from which the new growth will develop later) should be painted immediately with shellac. When the shellac has dried, a wound dressing or tree paint should be applied over all of the exposed area.

There are various types of wound dressings. Those most commonly used are orange shellac, asphaltum paints, outdoor house paint, grafting wax and alcohol, and the commercial tree paints.

Regardless of the type dressing used, you will get best results if you inspect the dressed surfaces periodically and recoat them once or twice a year. Before recoating is applied clean the wound with a stiff wire brush to remove all blisters and loose flakes. Do not cover the new growth with this coat of wound dressing.

Any gardener who wishes to become proficient in the art of pruning must understand that the job is not finished when the pruning shears are cleaned and put away.

The buds left on the plants should be observed when they expand, begin to grow and then mature until they flower and fruit.

This close observation is the best method of overcoming costly future mistakes and in learning how to correct past errors the next time pruning is done. When pruning is done properly the gardener will experience satisfaction in directing the course of nature in his plants in one of the few ways that nature permits him to do so.

RECOMMENDED READING MATERIAL

- THE PRUNING MANUAL— E. P. Christopher, The Macmillan Co., 1954.
- THE HOME BOOK OF TREES AND SHRUBS—J. J. Levison, Alfred A. Knopf, 1949.
- PRUNING IS SIMPLE—John & Carol Grant, Frank McCaffrey, Publishers, 1948.
- MAINTENANCE OF SHADE AND ORNAMENTAL TREES— P. P. Pirone, Oxford University Press, 1941.

SAFETY RULES FOR PRUNERS

1. Know the type of wood in the tree. Be especially cautious when pruning trees with weak, brittle wood such as silver maple, willow, poplar and tulip. Oak, hickory, pecan, elm and plane trees have strong, flexible wood.

2. Check your pruning tools often for safety and efficiency.

3. Study and decide on the general conditions of the tree. Greater care must be taken in old or weakened trees than in sound ones.

4. If possible, prune when the weather is warm and the trees are dry. When temperatures are low and the trees are wet, the job of pruning is always dangerous. When electric wires run

through or near the tree, the danger of electrical shock is increased in wet weather.

5. Never allow tools to come in contact with wires, even though they are supposed to be insulated.

6. Bark peeling and fungus growths are signs of dying and dead branches. Never depend for support on limbs that show these symptoms.

7. When pruning large trees, remember that any branch, no matter how sound in appearance, may give way under the weight of the pruner.

Always have a safety rope properly attached.