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PRUNING:
AN INTRODUCTION TO WHY, HOW, AND WHEN

Pruning is probably one of the least understood and most daunting landscape maintenance practices for most homeowners. Many people aren't sure what to do or when to do it. However, proper pruning is essential for maintaining attractive and healthy trees and shrubs. The practice of pruning can be simplified through an understanding of the basic principles and techniques. Although this general discussion focuses on pruning of ornamental trees and shrubs, many of the same principles will be applicable for more specialized procedures such as those used for tree fruit, small fruit, and roses.

Note: All figures are located at the end of this publication.

WHY DO WE PRUNE?

There are basically six key reasons to prune ornamental trees and shrubs.

1. Maintain Plant Health and Aesthetics:
- This involves removal of dead, diseased, or injured plant parts. Removal of these weak parts helps to minimize the potential for secondary or opportunistic pests.
- It also helps to maximize the aesthetic qualities and overall vigor of the shrub or tree.

2. Control Growth:
- This involves pruning to control the overall size and density of the plant.
- However, pruning *shouldn't* be the way to rectify mistakes in planning such as when you've selected and planted trees that are just too big or inappropriate for the site.

3. Encourage Flower and Fruit Production:
- This involves pruning to maximize flowering and fruit production.
- This usually involves pruning to open up the canopy in order to allow more light to penetrate. This stimulates the formation of flower buds.

4. Create Special Forms:
- This involves creating highly specialized forms such as hedges, espaliers, topiaries, and pollards.

5. Rejuvenate Old or Overgrown Plants:
- This involves pruning to create new plants from old plants.
- This practice is particularly helpful for shrubs that have become overgrown, sparse, or leggy and helps to stimulate the formation of new, more productive, vigorous wood.

6. Protect People and Property:
- This involves pruning of branches and limbs that are hazardous, weak, or rotted

and represent potential hazards to people and property.

PRUNING BASICS

An understanding of the basic equipment and basic principles of pruning will help to simplify any pruning job.

Basic Equipment:

As with any job, you need to have the right equipment and tools. Although there are many types of specialized equipment available for pruning, a few key tools provide the basic equipment for successful pruning.

1. Pruning Shears:

- These are used for small-diameter branches and twigs up to about 1½ inches in diameter.
- There are two types:
  - Scissors-type (bypass): these have two cutting blades and the cut is made as the blades bypass one another.
  - Anvil-type: these have a single cutting blade which strikes an anvil of solid metal. The cut is made when the blade impacts the solid surface.
- These are both available in left- and right-handed models.

2. Lopping Shears:

- These are used for branches greater than 1¾ inches in diameter.
- They are similar to pruning shears but have longer handles to provide the leverage needed to cut larger-diameter branches.
- These are also available as scissors- and anvil-types.

3. Pruning Saws:

- These are used for large branches and tree limbs, usually greater than 2-3 inches in diameter.
- Saws come in a variety of sizes and types.
- Chain saws can also be used if one has experience and proper safety equipment.

Regardless of the tool, it is important to keep it ***sharp*** and ***clean***. This can be done with regular sharpening and cleaning with 10% household bleach (1 part bleach: 9 parts water), 70% alcohol, or one of the commercially available compounds such as Greenshield®. After cleaning, the tools should be thoroughly rinsed and oiled. A sharp blade will give a clean cut with minimal damage to the tissues. Clean equipment will minimize the spread of any plant disease-causing organisms that may be present.

Basic Anatomical Feature:

When pruning large limbs and branches of woody plants, it is important to learn to recognize the **branch bark ridge (or branch collar) (BBR)** (Figure 1a). This key anatomical feature is a *unique* part of a tree or shrub's anatomy, which is *critical* to healing and woundwood production. The appearance of the branch bark ridge can vary from species to species. However, it is generally recognized as a slightly swollen area where a branch meets a limb or the main trunk. When making a pruning cut, it is important to cut just to the outside of the BBR, thereby leaving this structure in place (Figure 1b). Incorrect cuts include those made too far away from the BBR, which leave a stub, and those cut flush to the trunk or limb, which remove the BBR in the pruning process (Figures 1c and 1d).

Position of Shears:

In order to make a good cut, pruning shears need to be held correctly. They should be held upright since they are designed to cut properly in this position. Here, left- and right-handed shears can be an

important factor. If shears are held upside-down, they will not be in the correct position, angle, or orientation to make a clean, controlled cut.

Proper Pruning Cuts--Small Branches and Twigs:

There are three things to consider when making cuts on small branches and twigs.

1. Angle of cut: In order to optimize the surface area of the cut for healing, cuts should be made at a 45º angle (Figure 2).
2. Distance to the next bud: The optimum distance to the next bud is about ½ inch. When cuts are made closer or farther away, the bud is damaged or too long a stub remains and healing will be inhibited, respectively (Figure 2).
3. Inward- *vs*. Outward-facing buds: This can be used to manipulate the direction of the new growth and the shape of the plant. By pruning back to an inward-facing bud, the new growth will be toward the center of the plant, which will make it denser. Pruning back to an outward-facing bud will produce new growth away from the center of the plant and make it more open (Figure 3).

Proper Pruning Cuts--Large or Heavy Branches:

Many mistakes are made when people prune large or heavy branches. In many cases, the pruning process often results in damage to the tree. Pruning of a large or heavy limb (any limb greater than about 2 inches in diameter) should be a three-step process in order to avoid tearing or ripping of the bark while making the cut. When a single cut is used, the weight of the branch or limb may cause the limb and bark to tear several feet down the trunk before the cut is completed.

Three-Step Process (Figure 4):

1. First Cut: This cut is made at the underside or bottom of the limb, approximately 11-12 inches from the trunk. The cut should be made about halfway into the branch.

2. Second Cut: This cut is made on the top of the limb, approximately 15 inches from the trunk (i.e., farther than the first cut). This cut removes most of the branch or limb.

3. Third Cut: The final cut is made at the branch bark ridge. Since the weight of the limb has been removed, this final cut can be made with precision and without the risk of damage to the bark.

Pruning Paints and Dressings:

Use of pruning paints and dressings has been a controversial issue over the years. Current research indicates minimal value in treating *correctly pruned* cuts since the branch bark ridge and subsequent woundwood production by the tree or shrub are the best defenses against disease organisms and insects. This current suggestion is based on scientific rather than the anecdotal or "emotional" evidence of the past. Research has determined that, in many cases, pruning paints and dressings, particularly those made with turpentine, mineral spirits, creosote, or pentachlorophenol compounds, actually seal in moisture and potential disease organisms and inhibit natural wound healing and woundwood production by killing the wood. Pruning dressings usually serve a purely cosmetic, emotional purpose. Although they make you feel better, they can actually harm the tree.

Pruning vs. Shearing:

Most people don't distinguish between these techniques since both are used to remove unwanted plant growth. However, ***pruning*** is the focus of this discussion. Pruning is the process when individual branches are cut selectively. Shearing is the process when all branches

are cut indiscriminately. The latter technique is useful in specialized situations such as maintaining formal hedges or topiaries.

WHEN DO WE PRUNE?

The timing of pruning is very important and depends upon the type of plant and the desired outcome. When trying to decide when to prune, there are a few simple factors that need to be considered.

Basic Considerations for Pruning:

1. Dead, damaged, or dying wood:
   Wood of this type can be pruned at any time and should be removed as soon as it is evident.
2. Spring-flowering trees and shrubs:
   These should be pruned right after they bloom since they flower on wood that was produced during the previous growing season.
   Examples: azalea, rhododendron, mountain laurel, flowering plum, magnolia, forsythia, chokeberry, lilac, and flowering quince.
3. Summer-flowering trees and shrubs:
   These should be pruned in late winter or spring *before* new growth starts. Their flowers are borne on wood produced that same year.
   Examples: autumn olive, beauty bush, snowberry, coralberry, Rose-of-Sharon, viburnum, and summersweet.
4. Trees and shrubs without flowers or fruit:
   These should be pruned when they are dormant, typically in late winter or spring, before growth has begun. This includes most deciduous shrubs and shade trees (maple, oak, elm), most needled evergreens, and many of the "non-flowering" broadleaved evergreens such as holly. Pruning when deciduous trees are dormant is especially helpful because it allows one to see the form and structure of the tree without the leafy canopy. Some trees "bleed" after pruning. Although this actually causes no harm, pruning these trees (e.g., maple, birch, butternut) can be delayed until their leaves are fully expanded.

How much do I prune?

Most trees and shrubs benefit from ***light*** to ***moderate*** pruning every year or every few years. However, most needled evergreens (e.g., spruce, pine, fir) require infrequent, minimal pruning.

HOW DO WE PRUNE?

Basic pruning practices or techniques:

There are many techniques for specialized pruning and the desired outcome is what determines the technique that one would use. However, the three most basic and useful practices are thinning, heading, and rejuvenation. The final goal of any pruning practice is to increase the health and aesthetics without giving the tree or shrub the look of having been pruned.

1. THINNING CUTS

These types of cuts remove entire branches or shoots. ***All*** thinning cuts are made at the base of the branch *or* at ground level (Figure 5). These cuts are used to literally "thin" out the plant and stimulate more vigorous growth of the remaining branches. When done properly, the natural shape is maintained. This technique is especially useful for plants that are too dense (for example, burning bush).

2. HEADING CUTS

These cuts shorten but **do not** remove entire branches or shoots. Heading cuts stimulate the buds on the remaining portion of the branch or shoot to grow (Figures 6 and 7). This technique is used to

promote a dense, more compact growth habit. It is also used to reduce the overall size or height of a plant. Heading cuts can be used to "shape" the plant by cutting back to inward- *vs.* outward-facing buds. In order to maintain the natural growth of the plant, it is important not to top or cut all branches back to the same level. This leads to excessive, unattractive growth (Figures 8 and 9).

Ideally, the best pruning often ***combines both thinning and heading cuts*** (Figure 10). Thinning helps to open the center and heading helps to control the size and height. Again, the goal is not to look pruned! For thinning and heading cuts, it is suggested that no more than 30% of the branches be cut in a single season.

3. REJUVENATION PRUNING

This is a very useful but daunting method of pruning. It is the most severe of all pruning methods. Rejuvenation pruning is typically used on older plants that are too large, overgrown, or are "leggy" and sparse. There are two methods:

-- Drastic: cuts are all made at once.

-- Gradual: cuts are made over a 3-year period (1/3 is cut each year).

Factors for Consideration Before Rejuvenation Pruning:

Before doing a rejuvenation pruning, there are several important factors that need consideration.

1. What plants can be rejuvenated?

It is very important to know how the plant in question will respond to this procedure.

- Broadleaved evergreens: Most broadleaved evergreens such as rhododendron, mountain laurel, and pieris respond well to this procedure provided they are in good health.
- Deciduous shrubs: Most deciduous shrubs can be rejuvenated as long as they are generally in good health; privet responds very well.
- Needled evergreens: Those that have the ability to initiate new growth on needle-less wood are candidates for rejuvenation pruning such as yew and arborvitae. However, most needled evergreens do not have adventitious buds on old wood and can't be cut back to wood which has no needles. Examples of these include juniper, hemlock, and chamaecyparis.

2. Ability to give sound before- and after-care:

- In most cases, if rejuvenation pruning is the anticipated goal, it is important to fertilize the plant in late fall (the fall prior to spring pruning) or to fertilize right after the rejuvenation pruning.
- The ability of the plant to respond to this procedure depends upon sound cultural care both before and after. Watering, mulching, and follow-up pruning during the summer are critical to the recovery of the plant after rejuvenation pruning.

3. Impact of this technique on the aesthetics:

- Consider the immediate impact of this procedure on the aesthetics of the landscape. Once the procedure is done, recovery may take several years.

4. Timing:

- Rejuvenation pruning is done in early spring ***before*** growth has started.

Drastic Rejuvenation Pruning (Figure 11)**:**

- All cuts are made in the dormant season.
- All wood is cut back to 6-10 inches.
- This technique requires follow-up pruning in midsummer to control new growth.

Moderate or Gradual Rejuvenation Pruning (Figures 12, 13, 14, 15):

- This is usually done over a 3-year period.
- One third of the top growth is cut back each year. For example, if the shrub has 9 main branches, one would cut 3 the 1st year, 3 more the 2nd year, and the remaining 3 the 3rd year.

HELPFUL SPECIALIZED PRUNING TECHNIQUES

Pruning Hedges:

There are two basic types of pruning methods for hedges--formal and informal or natural (Figure 16). Formal hedges are usually sheared and have a defined, controlled shape. Informal or natural hedges are usually pruned and have a shape that is determined by the natural growth habit of the plant used in the hedge.

Regardless of which type, there are two important considerations:

1. It is necessary to start pruning to develop the hedge the first year. This is very important since you need to encourage full, low growth right from the start. It is often difficult to try to make a dense hedge after plants have been allowed to grow without any pruning for several years.
2. The shape of the hedge is very important and all hedges need to be wider at the bottom than the top. This is true for both formal and informal types. The triangular shape helps to expose more of the plant to light and eliminates sparse, twiggy growth at the base (Figure 17).

Pruning Needled Evergreens:

Needled evergreens generally don't require much pruning. However, before doing any pruning, you need to be aware of the type of tree or shrub that you have. There are two categories of needled evergreens based on their branching pattern:

1. **Whorled branches:** These have no buds on needle-less shoots so you would only prune to ***active***, needled shoots. Examples include pine, spruce, fir, Douglas fir, juniper, and chamaecyparis.
2. **Random branches:** There are two types of random-branching needled evergreens.

    a. Those that have latent buds--these can be pruned back to wood without needles. Examples are yew and arborvitae.

    b. Those that don't have latent buds--these include juniper and cedar.

SUMMARY

Armed with an understanding of the basics of pruning and the proper tools, pruning should lose some of its anxiety and confusion and become a routine component of any landscape maintenance program.

August 2012

Figures begin on next page.

Figure 1a.
Branch Bark Ridge and Branch Collar

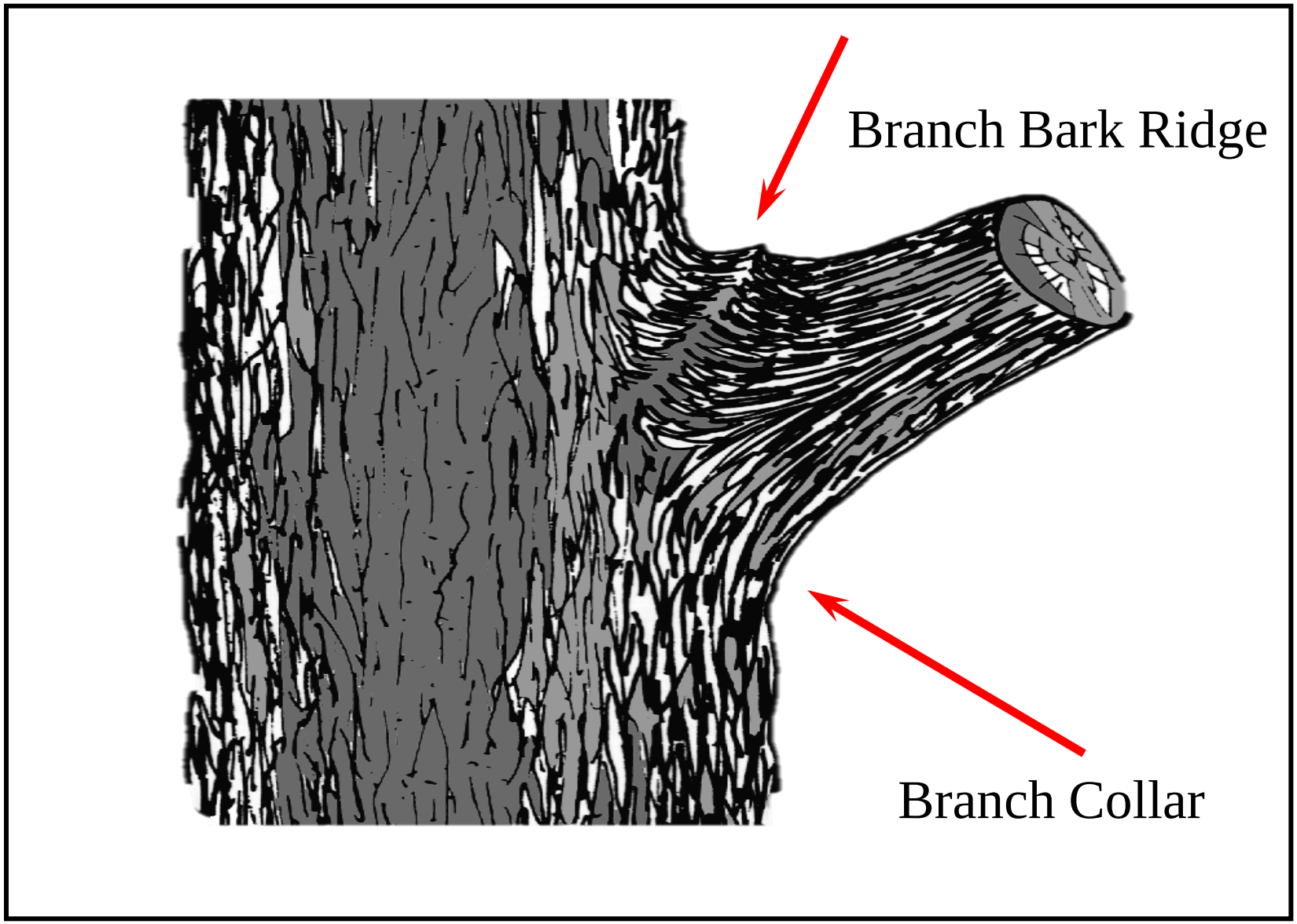


Figure 1b.
Branch Bark Ridge and Branch Collar

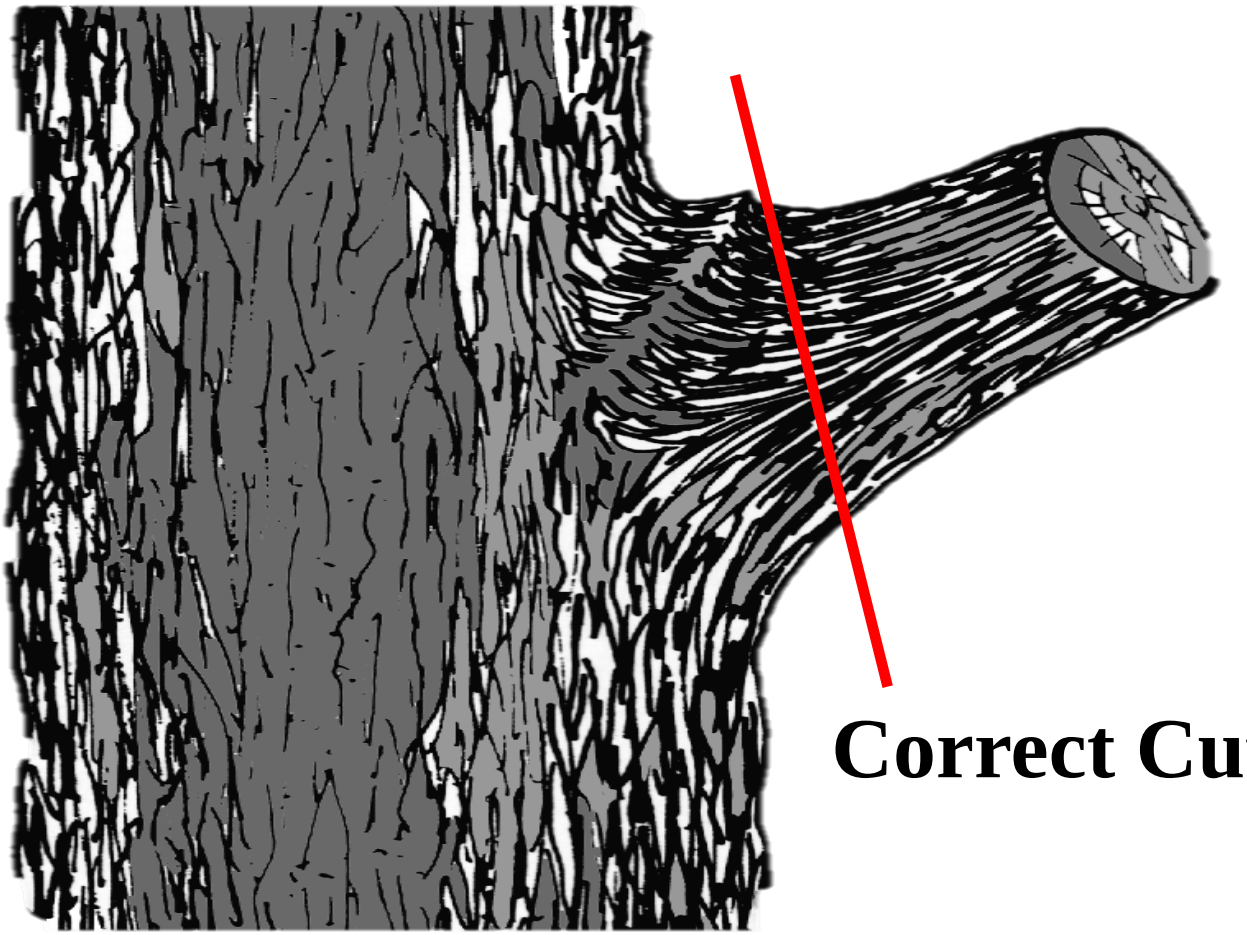


Figure 1c.
Branch Bark Ridge and Branch Collar

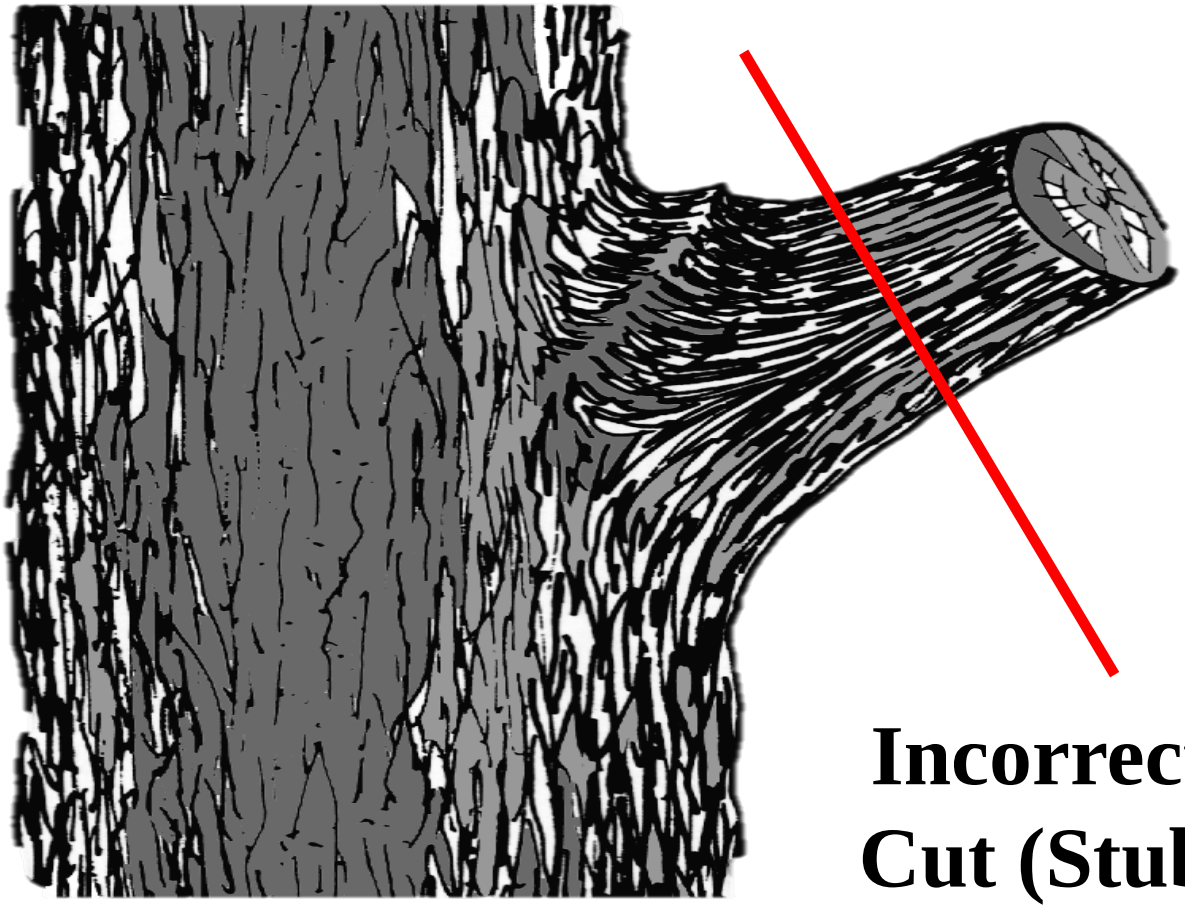
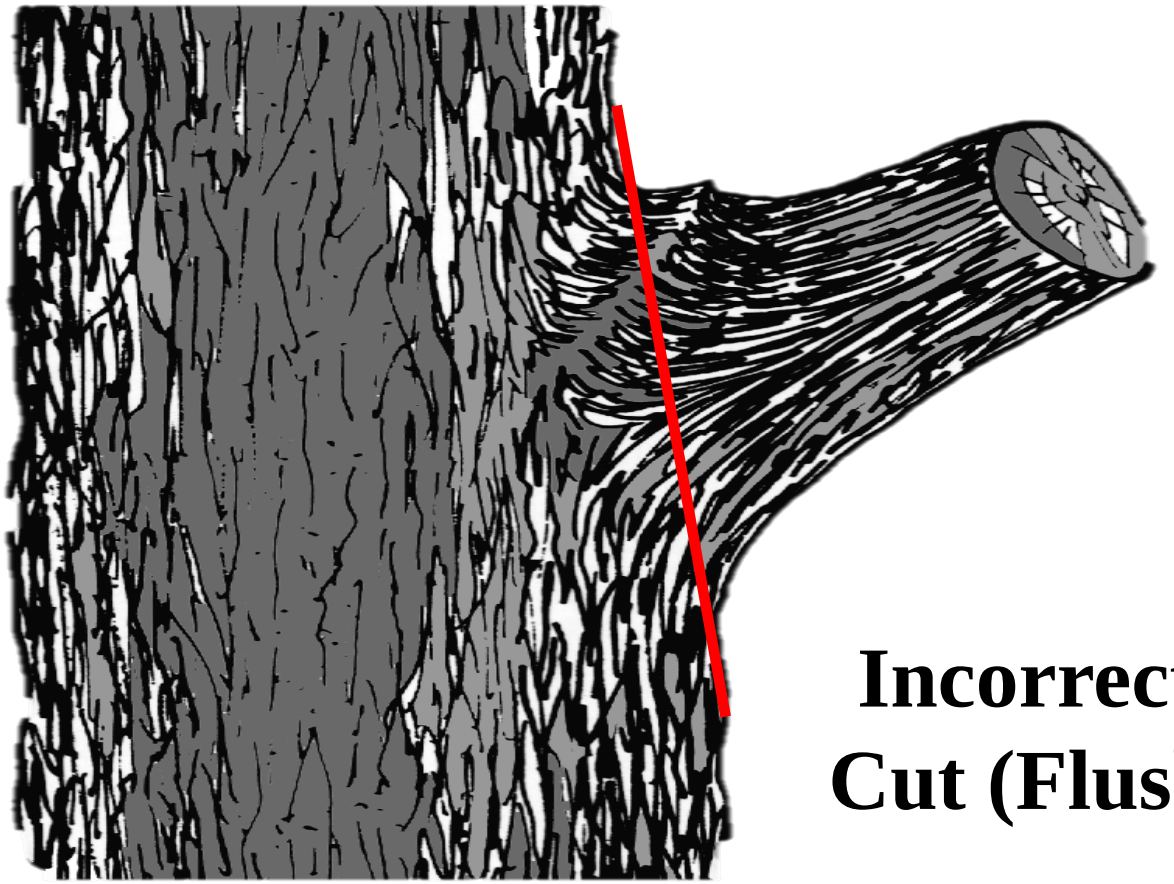


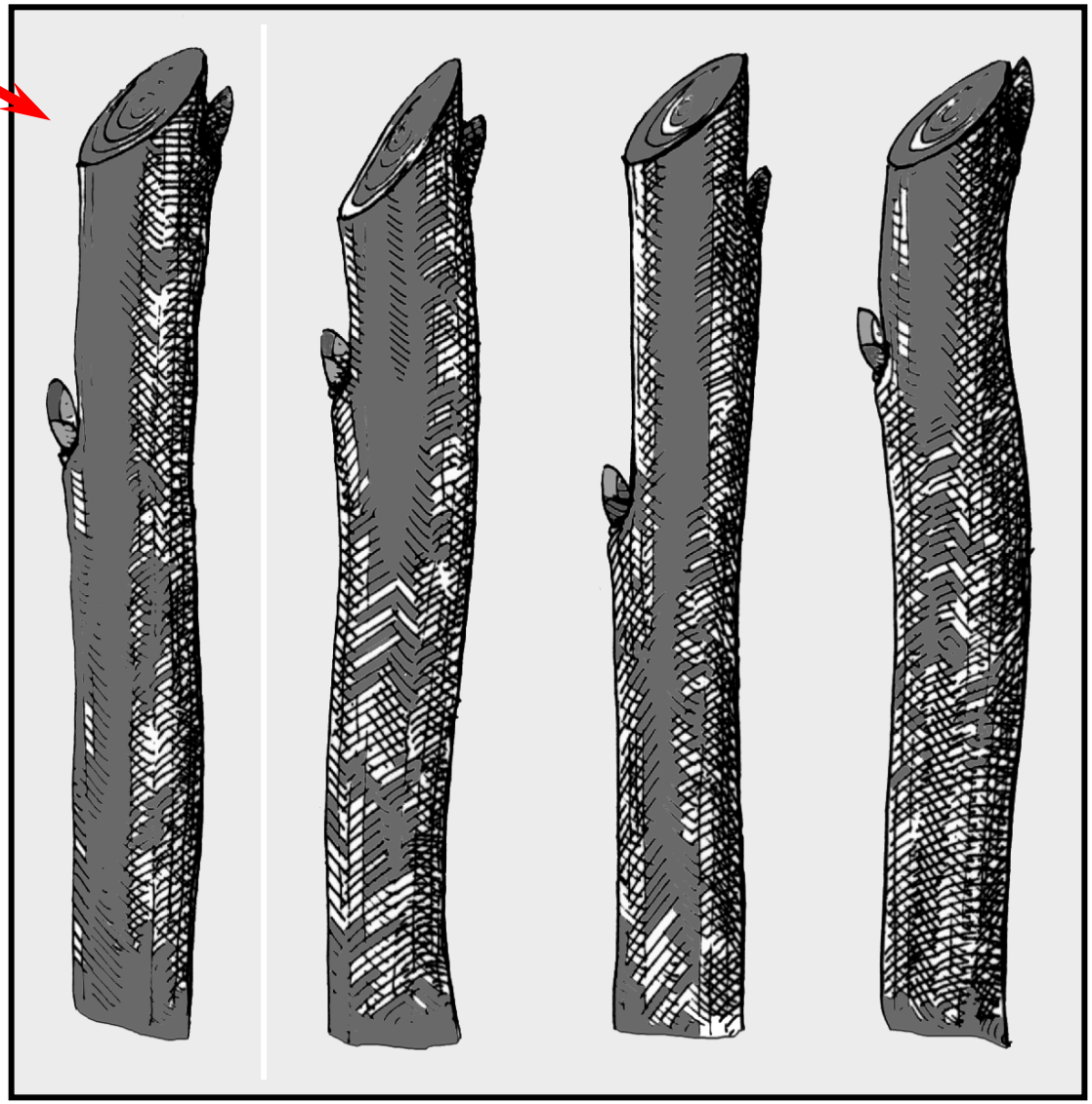
Figure 1d.
Branch Bark Ridge and Branch Collar



Incorrect Cut (Flush)

Figure 2.

CORRECT CUT INCORRECT CUTS



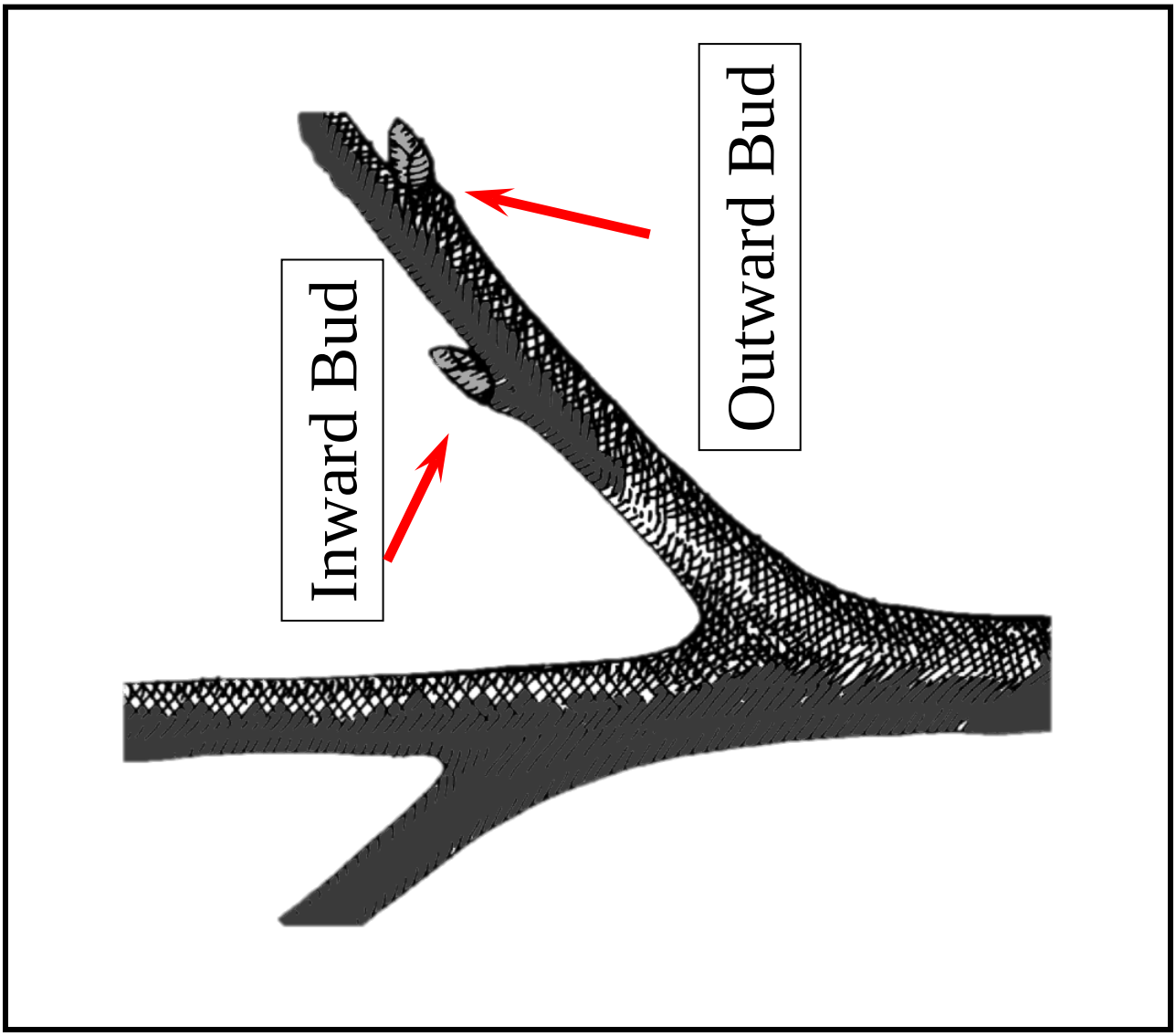


Figure 3.

Figure 4a.
PRUNING LARGE BRANCHES OR LIMBS

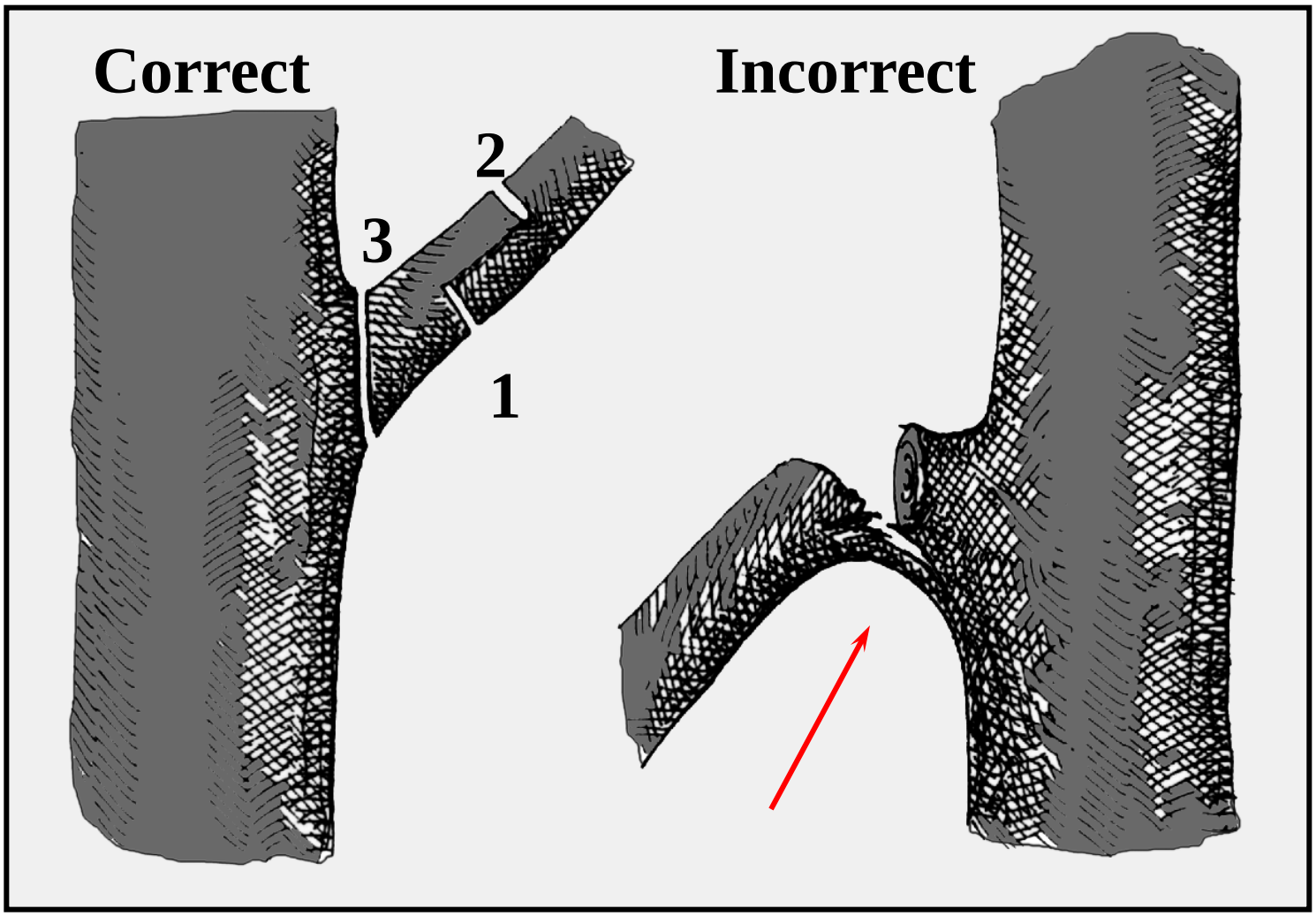


Figure 4b.
PRUNING A LARGE BRANCH OR LIMB

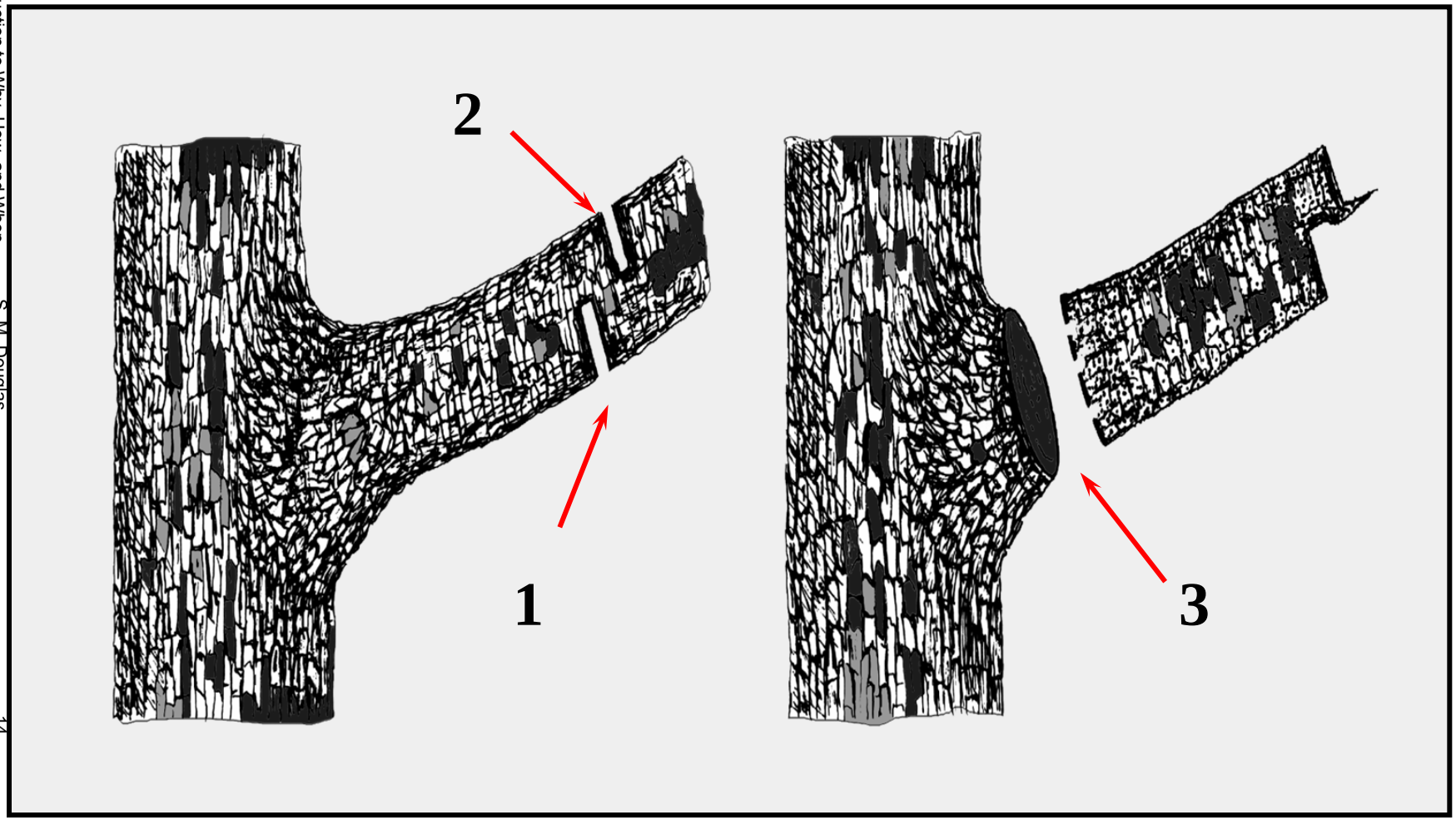


Figure 5.
THINNING CUTS

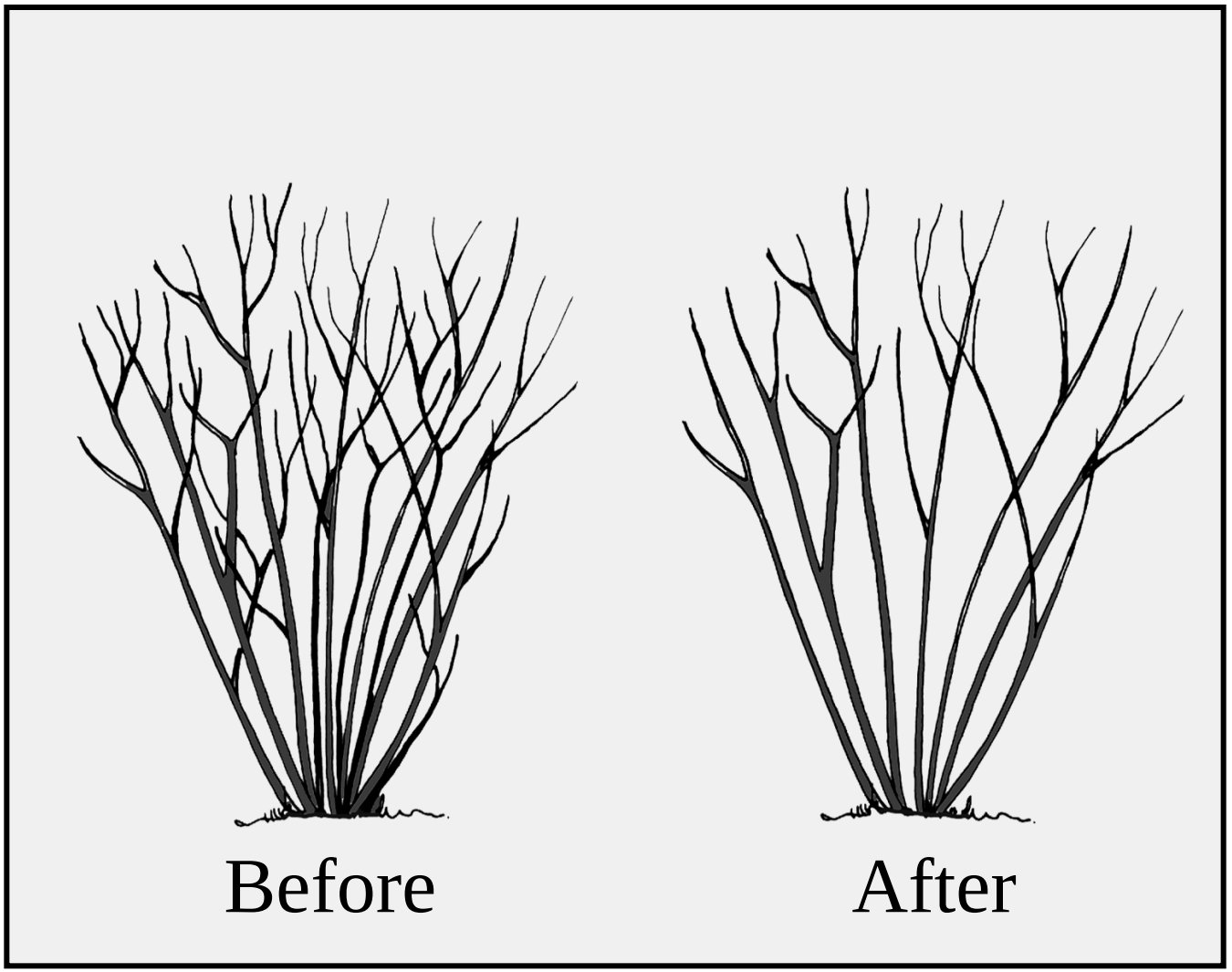


Figure 6.
HEADING CUTS

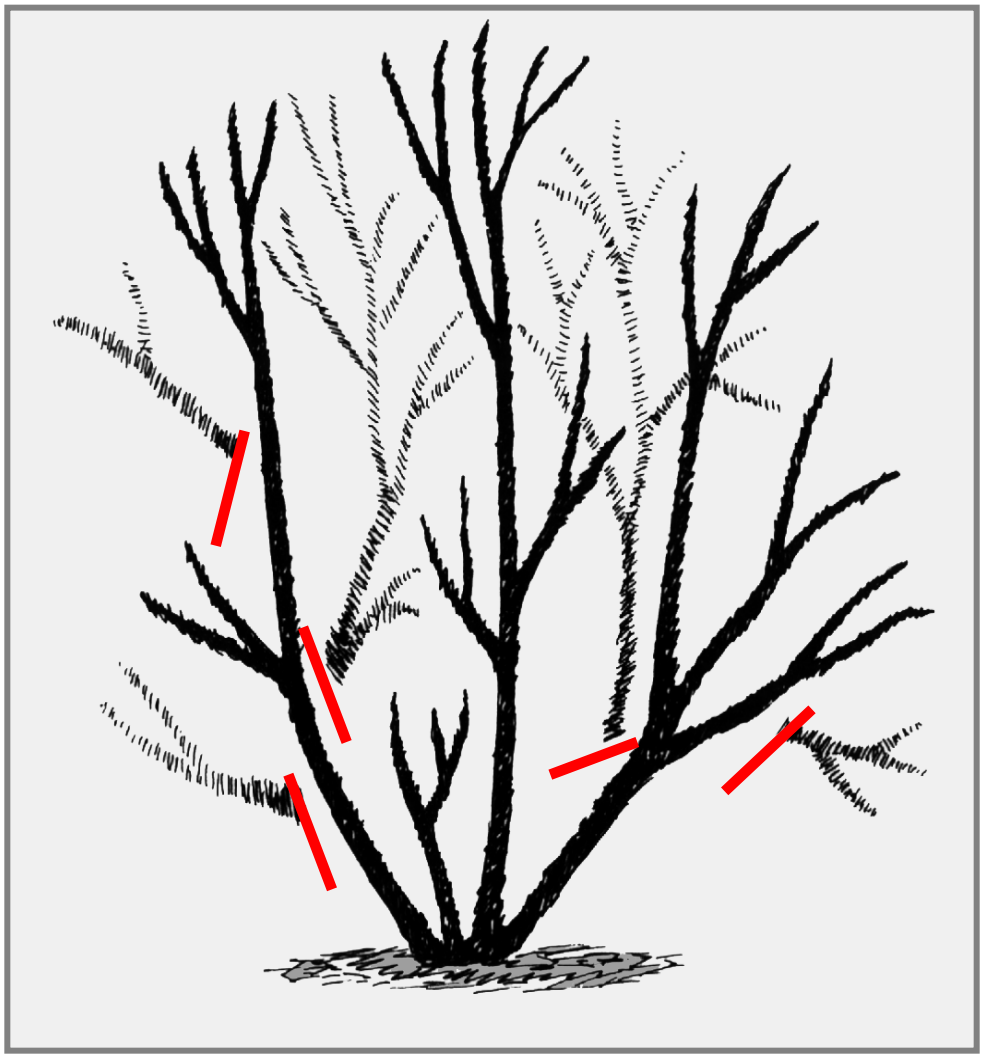


Figure 7.
HEADING CUTS

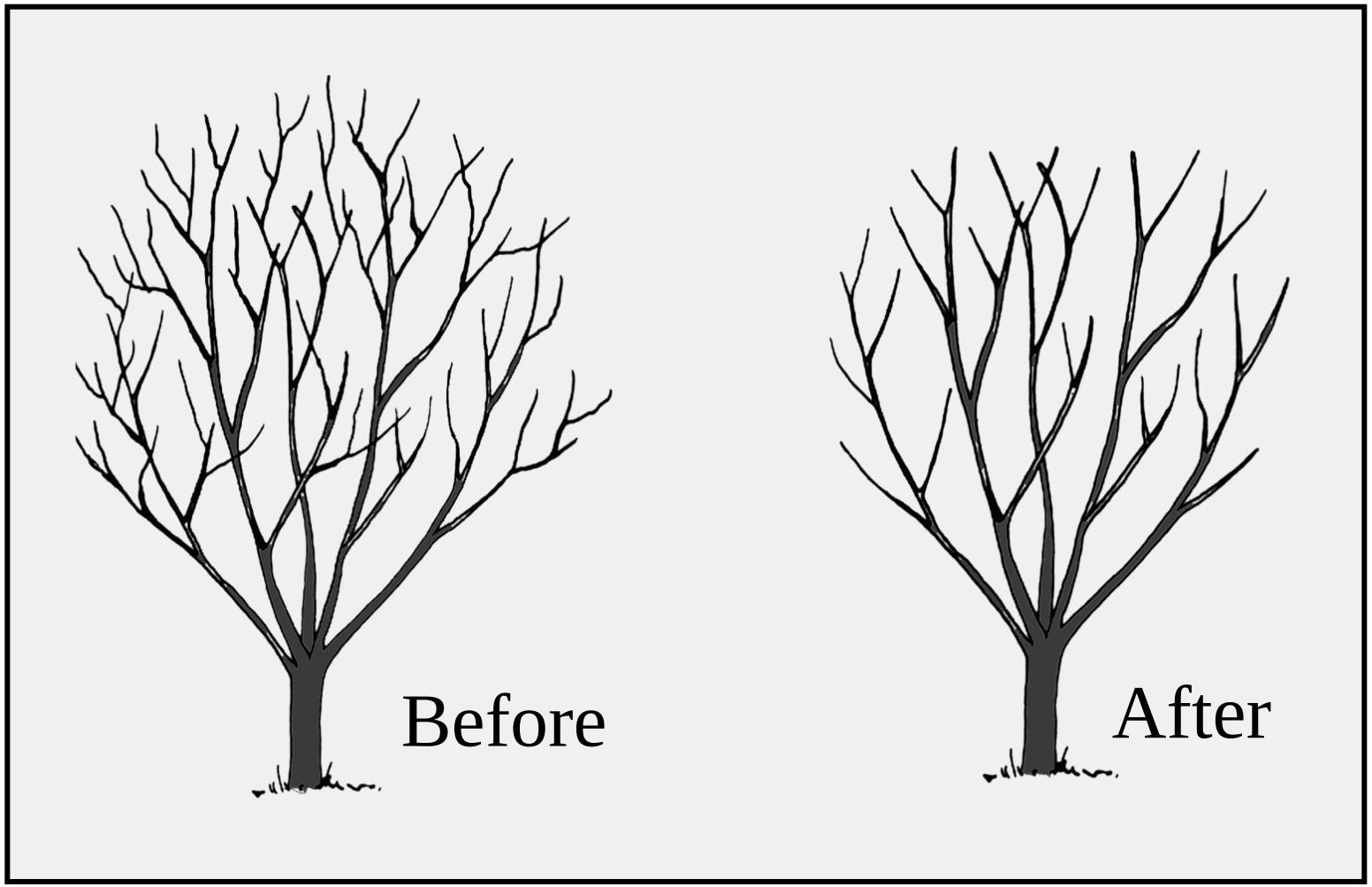


Figure 8.
INCORRECT PRUNING: TOPPING

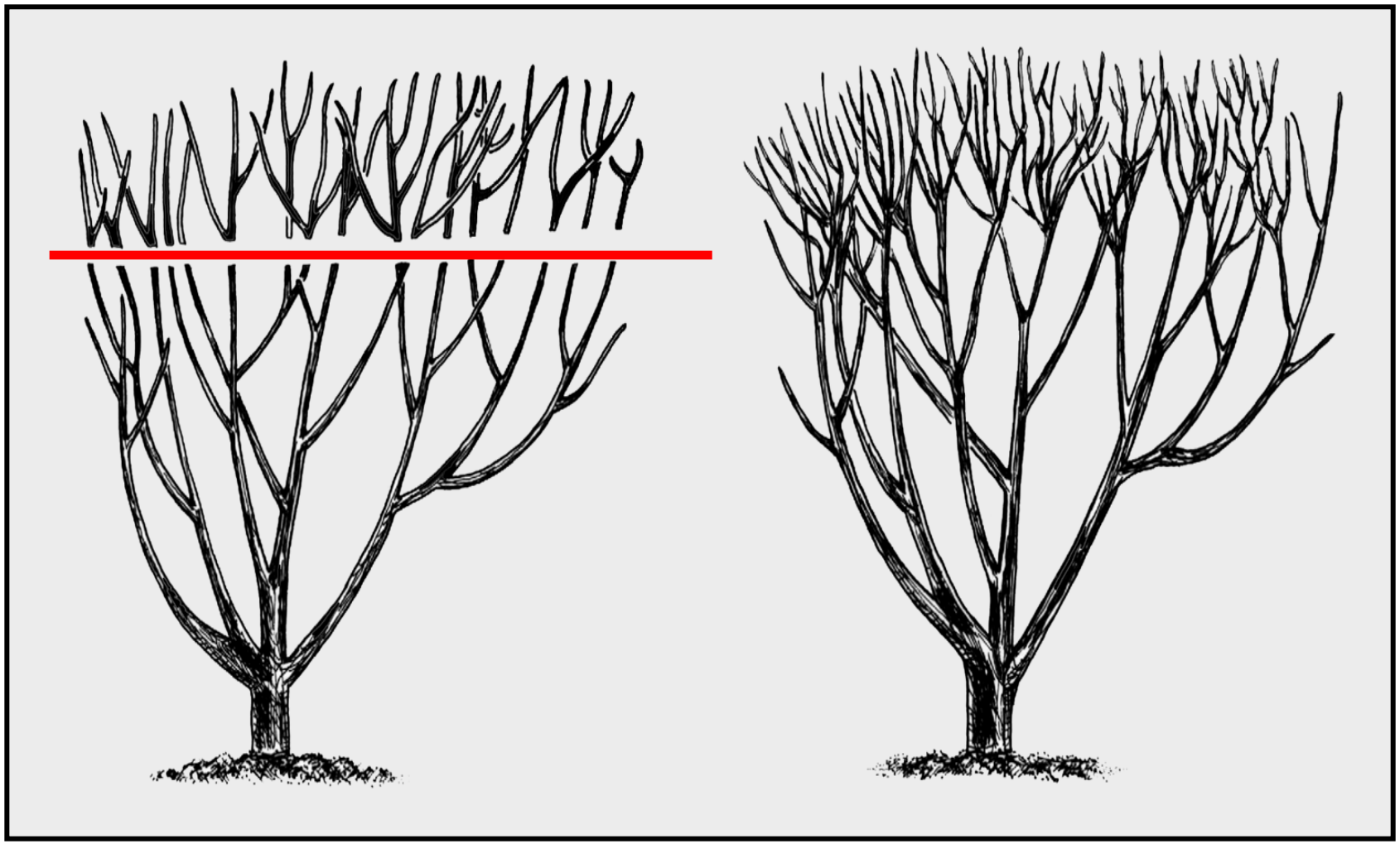


Figure 9.
INCORRECT PRUNING: TOPPING

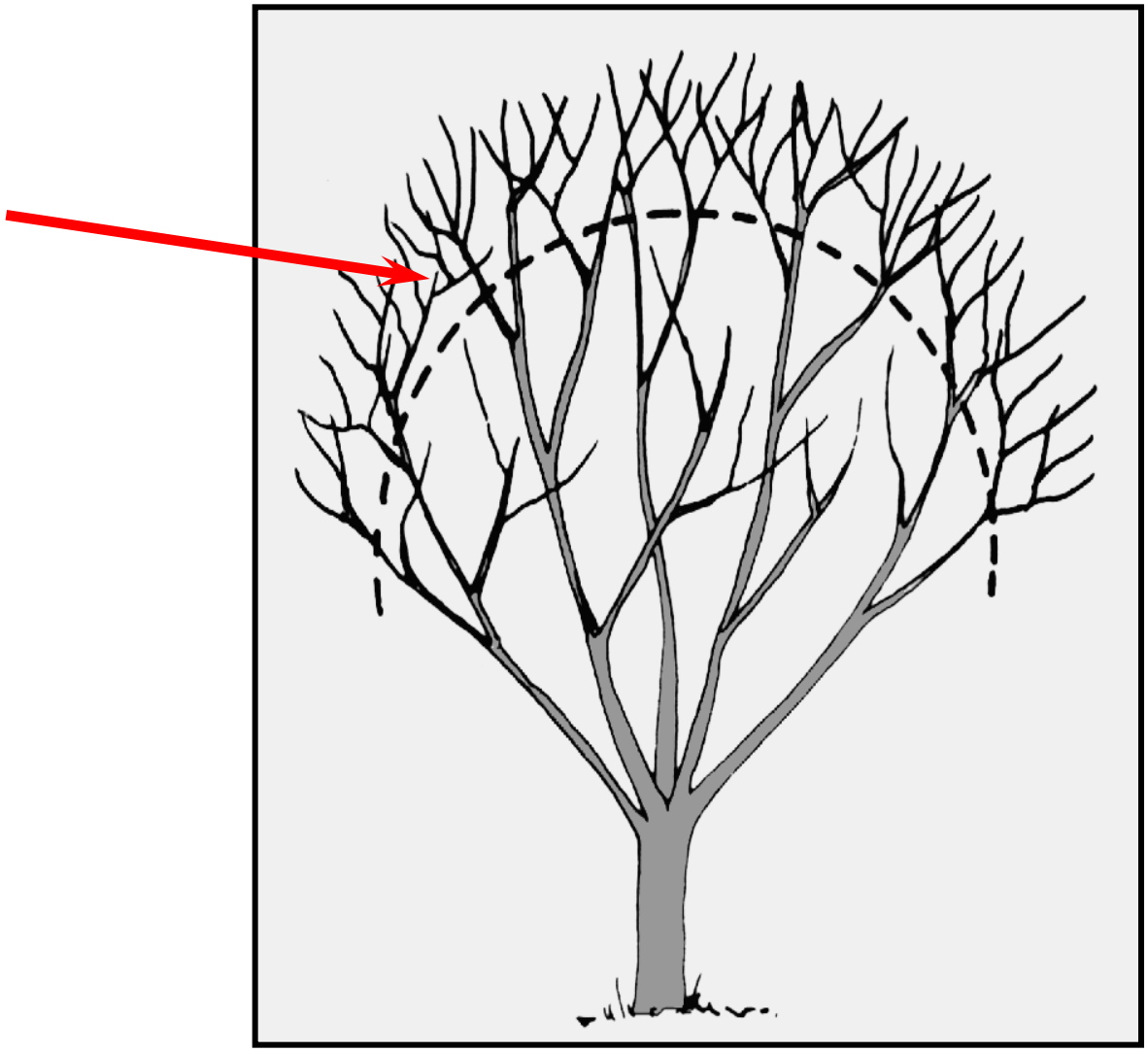


Figure 10.
PROPER PRUNING OF A SHRUB

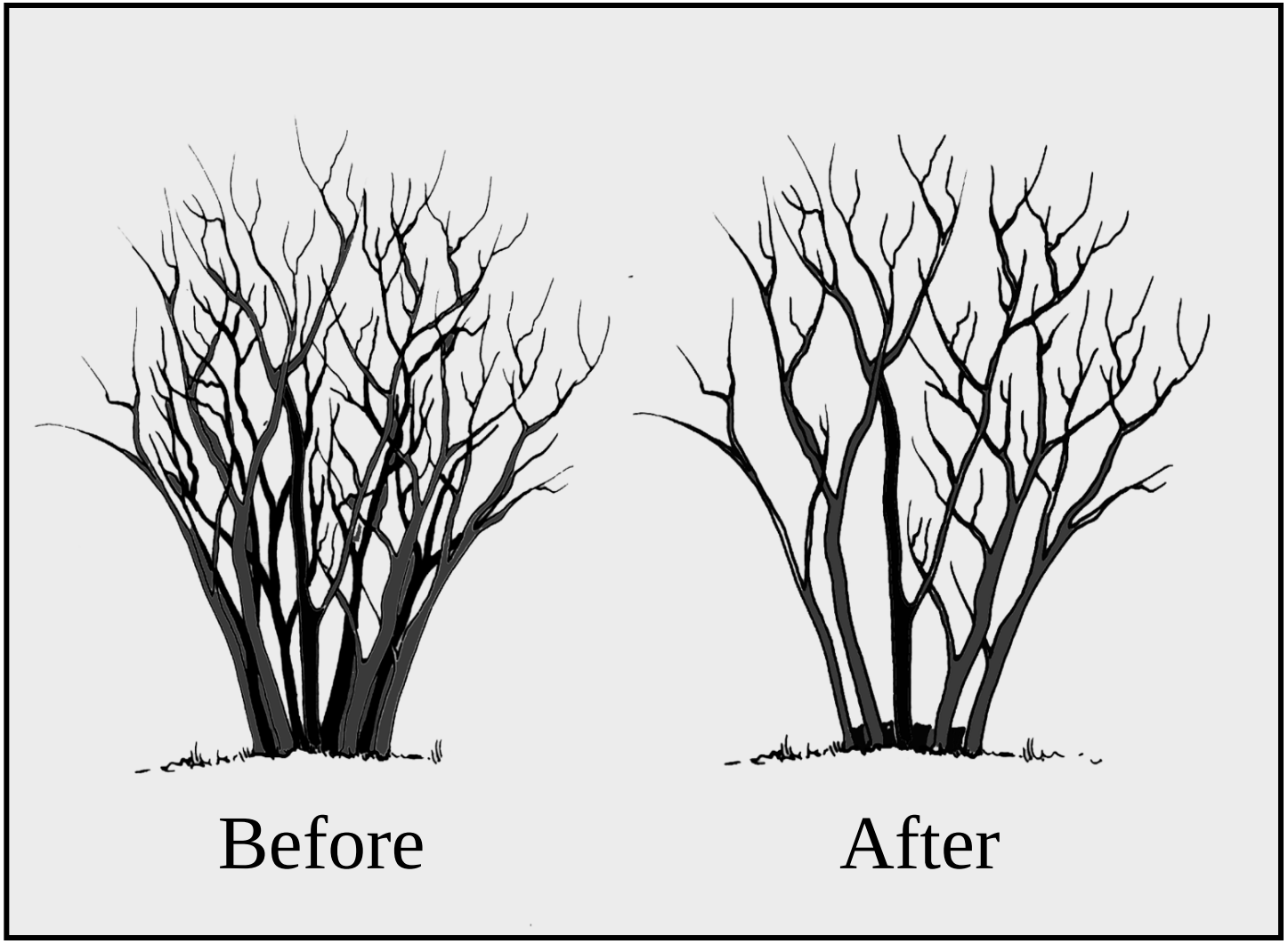


Figure 11.
REJUVENATION PRUNING: DRASTIC

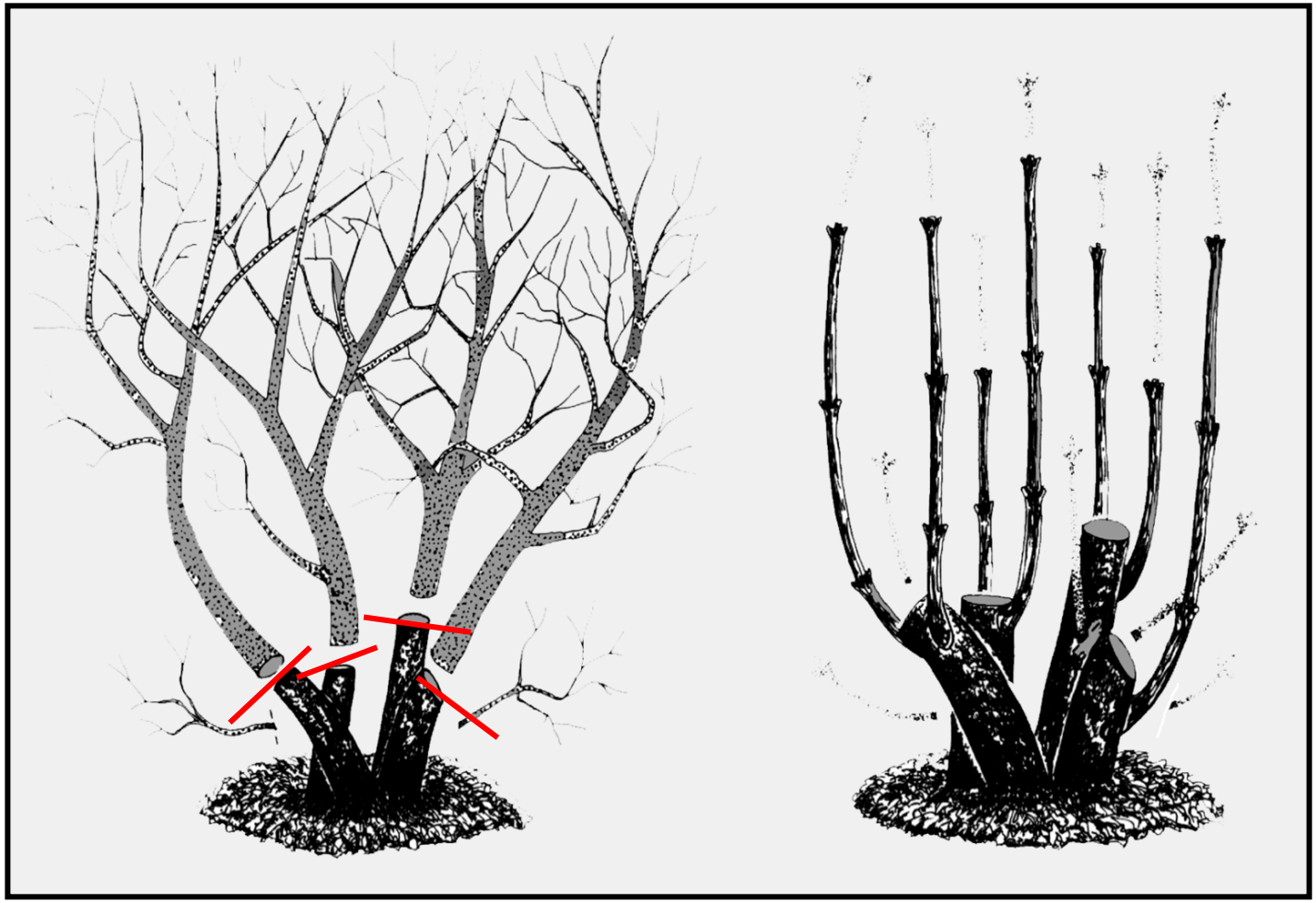


Figure 12.
REJUVENATION PRUNING: BASAL CUT

Figure 13.
REJUVENATION PRUNING: GRADUAL

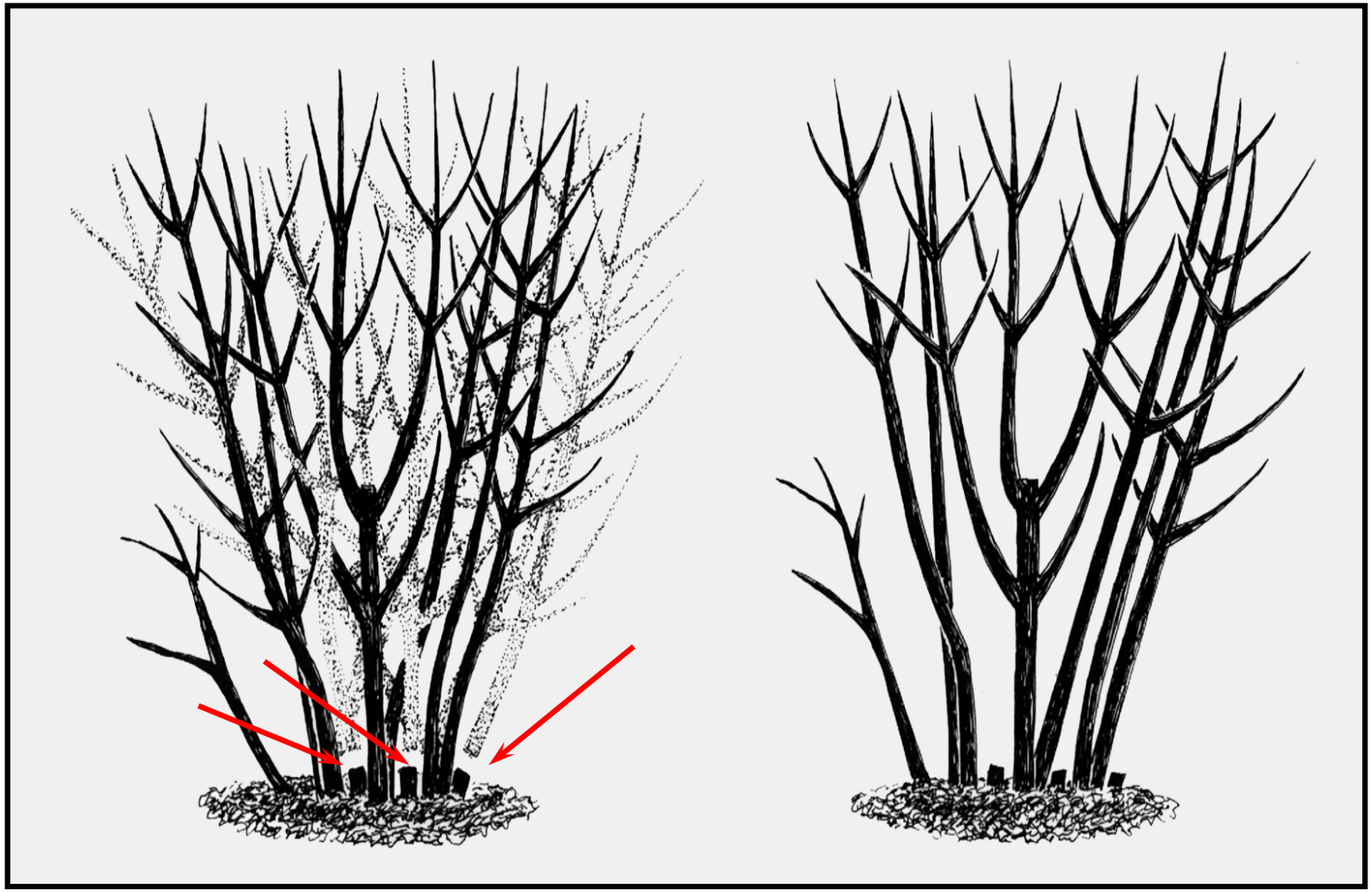


Figure 14.
REJUVENATION PRUNING: MODERATE

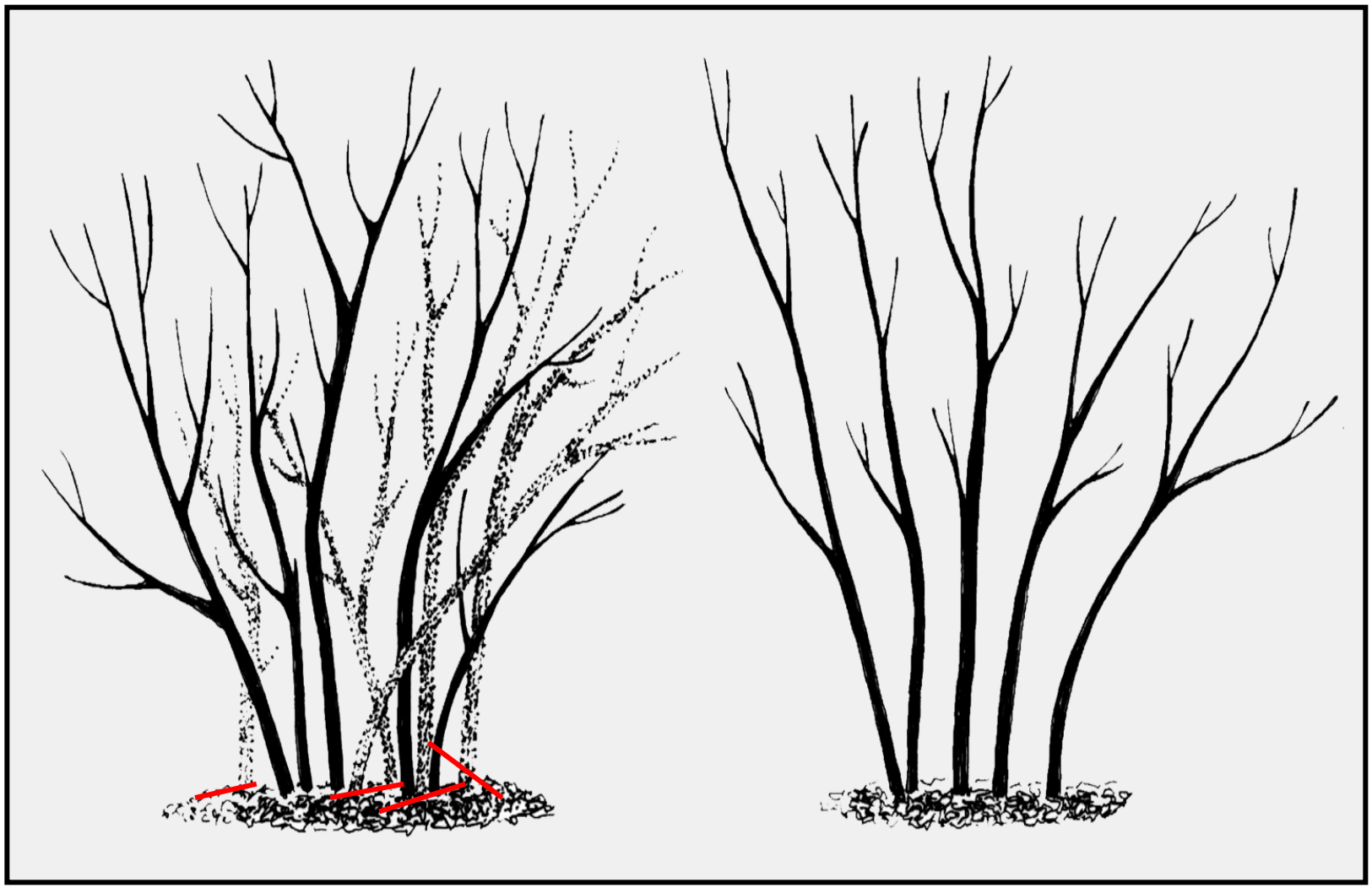


Figure 15.
REJUVENATION PRUNING: ONE YEAR LATER

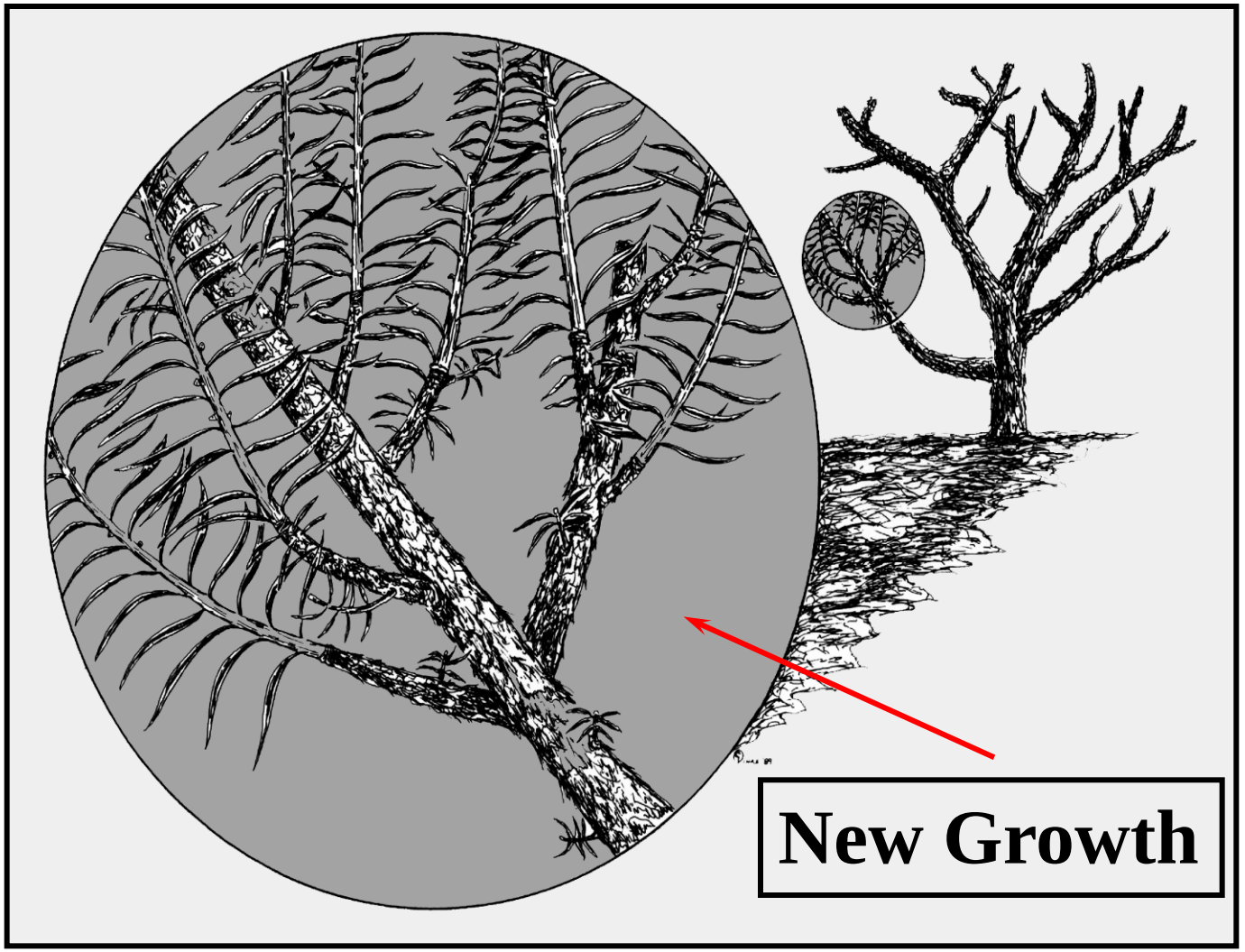


Figure 16.
HEDGE PRUNING

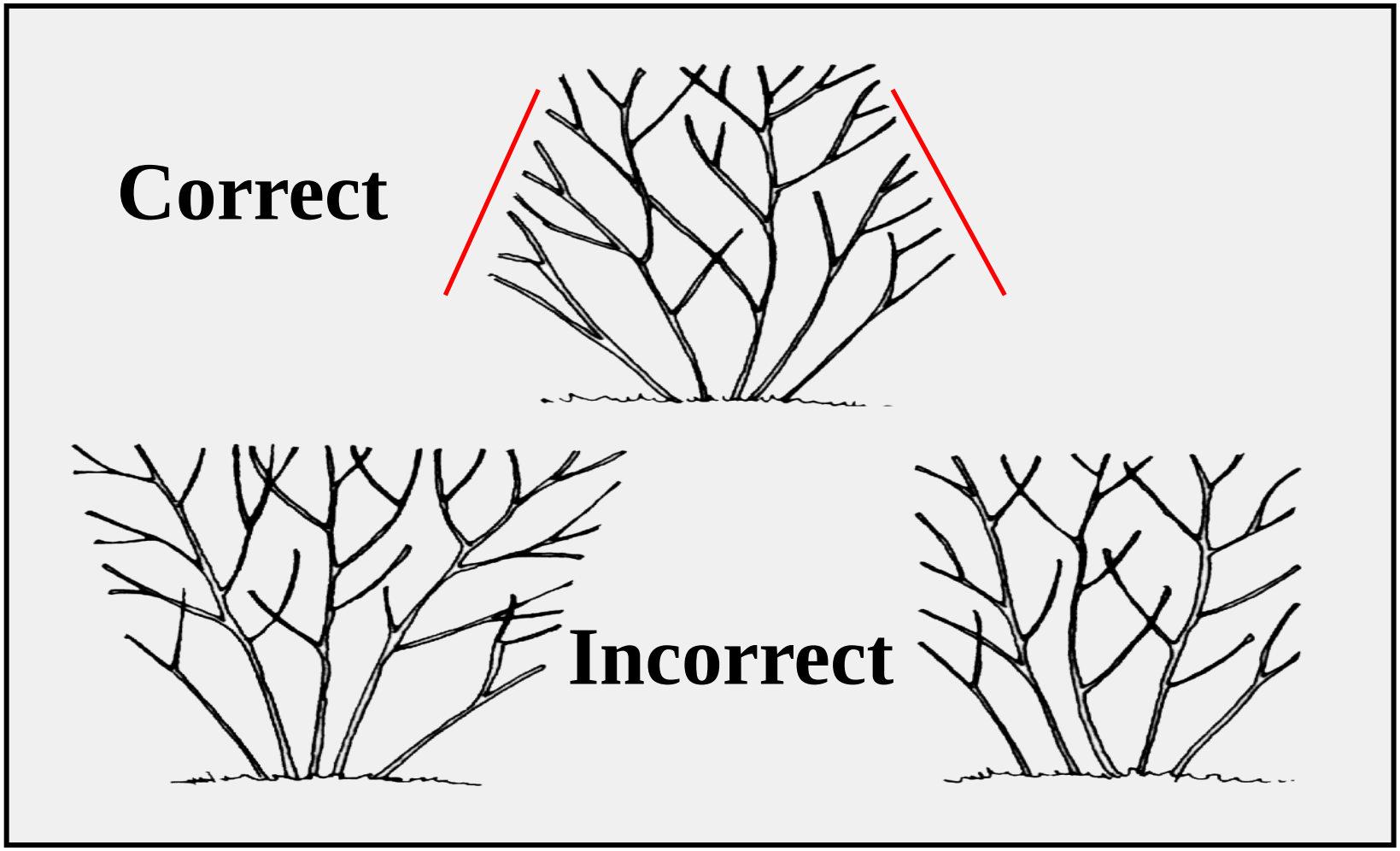


Figure 17.
HEDGE PRUNING