

20 Questions of Pruning

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No matter how far we advance in the horticulture industry in dealing with the various aspects of plant care, we need to be reminded of the basics. This article reviews the basics of pruning woody plants.

Pruning of trees and shrubs should be a regular part of the holistic approach to plant care. It involves the selective removal of specific plant parts, which may be dead wood, shoots, or branches and can involve removal of roots, flower buds, spent flowers, fruits, and seeds.

Although pruning can be defined simply as the selective removal of plant parts, there is more to be considered. That is the basis for the 20 questions of pruning.

1. What is the plant to be pruned?

Without knowing the exact genus or species of a plant, improper techniques may be used during the pruning process. For example, pruning of pines is only done during the time of development of the new growth or *candles*. Yet many other conifers can be pruned at any time of the year. Pruning of pines at any other time during the year can result in die back and eventual death of branches.

Another example of needing to know the genus involves palms. A person needs to

know the difference between a woody tree and a palm tree. Pruning and thinning a palm tree in the same fashion as a woody shade tree would result in death of the growth crown of the palm.

Further, just knowing the genus may not be enough. With hydrangeas as an example, the species commonly known as large leaf hydrangea (*Hydrangea macrophylla*), e.g., the 'Nikko Blue' cultivar, can be pruned in the spring and not affect flowering. This plant flowers on new wood. Yet another species, oakleaf (*Hydrangea quercifolia*) sets its flower buds in late summer during the previous year. Pruning them in the spring would remove flower buds from that year.

2. What is the natural habit of growth of the plant to be pruned?

Is the pruning process an attempt to make the shrub or tree into something it cannot be? A spreading shrub is not going to become an upright or columnar plant through pruning.

This also leads to the possibility that the plant is the wrong plant for the location or that the plant is planted too close to an entrance, walk, street, or another plant. It may be possible that the only solution to the pruning dilemma is total removal of the plant and installation of another more suitable plant for the location.

An excellent example would be trying to use English ivy as a groundcover among

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other shrubs and next to a building. A choice of another groundcover plant would save almost unending pruning and potential damage to the other plants and the building. English ivy grows very vigorously, sometimes as much as 20 feet per year. The plant may then grow over other plants, shading them and preventing sunlight from reaching anything but the ivy.

The other problem with English ivy is its method of attaching itself to structures for climbing. This ivy forms roots at every leaf node, roots that penetrate into whatever it is climbing. This includes mortar, concrete, brick, and bark.

As English ivy plants and their roots grow, the roots expand and cause these materials to crack and break up. Long-term growth of English ivy on buildings can cause actual destruction of the structure.

3. Where is the plant growing?

The type of pruning can be affected by the location. A formal type of pruning or a crown thinning would not be used on shrubs and trees that were planted as a screen on an industrial site.

Further, root pruning would not be done to shrubs planted for the purpose of erosion control. The pruning methods and practices need to match the purpose for which the plants are placed in the landscape.

Also laws and regulations may affect the pruning of the plant and its location. For example, a plant may be blocking the visibility of traffic regulatory signs.

Plants may have to be pruned to meet the requirements of the Americans with Disabilities Act (ADA). This brings about the consideration that the actual pruning may be total removal of the plant and/

or replacing it with a plant with a more suitable habit of growth for the site.

4. What is the purpose for pruning the plant?

Pruning may be done to reduce plant size to make it fuller and denser, to make it spread, or to make a plant more upright. Pruning may be nothing more than an effort to improve the plant's shape or habit or to create special shapes and forms such as espalier or standards.

Pruning is done to train young plants, or it can be done to rejuvenate "elderly" plant material already in the landscape. This rejuvenation can be done in the case of shrubs by removing a fourth of the stems or by cutting the plant to within inches of the ground. Knowing what the best practice is relates to question No. 1 — what is the plant?

Proper pruning techniques can be used to increase or decrease flowering. One may want more flowers for the beauty of the plant, or fewer flowers may be desired in order to produce less fruit.

Pruning must be done to prevent damage to personal property, such as preventing branches from dropping on vehicles and buildings. An example of pruning to prevent property damage would be to keep English ivy cut back to prevent it from destroying mortar in a brick building.

Finally, the law may require pruning. In the case of the Americans with Disabilities Act, there must be enough clearance above and next to walkways so as to avoid a barrier to users of the walkways and steps.

Trees that are growing into streets and highways become visual and physical barriers, raising legal issues.

5. What does the client want?

The client may want the plant to be beautiful, or to fit into a location, or simply to be healthy. Knowing the plant and its requirements becomes very important in determining whether these requests can be met.

Sometimes client expectations are unreasonable, which means that the pruner has the opportunity to be an educator. A plant that has a very high sentimental value but has lived its full expected life cannot be made healthy by pruning.

Further, a plant that is not suited for its location due to size, shape, or natural environment cannot be made to fit by pruning. Pruning is not the solution to poor selection originally, and the sometimes unreasonable expectations for a pruning fix need to be professionally addressed prior to starting the job.

6. What is the present health of the plant?

Is the plant healthy enough to withstand the “shock” of pruning? It may be that the pruning of a weakened plant may be the final blow that leads to its death if there is not enough vigor. Pruning may actually remove the plant’s ability to adequately photosynthesize and thus bring about decline and eventual death.

The person may also spread disease, causing pathogens from a diseased plant to spread to healthy plants unintentionally. The plant to be pruned could be infected with pathogens that are easily transferred on the pruning equipment.

7. Will the plant be healthier when pruning is completed?

It is possible that the pruning can actually make the health of the plant worse, rather

than improve the plant’s health. An example would be pruning a crabapple infected with fireblight. As a result of pruning, the pathogens could be spread to healthy parts of that plant or spread to other healthy plants.

Another possibility could be the thinning of a shade tree. This would open shaded branches to sunlight, providing the proper conditions and environment for sun scald and eventual decline of the upper branches. This commonly happens with crown thinning of maples such as sugar maple and Norway maple.

Heavy amounts of pruning can initiate an abundance of suckering. These suckers, being generally quite succulent, are easily attacked by pathogens and pests, thus causing the possibility for plant decline. Further, if the plant is in a state of decline at the time of pruning, wounds may not compartmentalize properly. This presents another opportunity for insect and pathogen entry into the plant.

Sometimes the only economical recourse is complete plant removal and replacement. Otherwise, the resulting plant, after pruning, may not be of any landscape value or may become even more costly to maintain due to having to control disease, pests, or other forms of decline.

8. Is it the proper time to prune?

Many factors can affect the timing of pruning. These factors include temperature extremes, moisture and humidity extremes, time of day and year, and when the flower buds are set.

With temperature, pruning when the temperature is too cold can result in the death of the living cells in the vascular cambium, thus slowing callusing and closing of the wound. With the opposite extreme of high temperatures, excessive

transpiration can slow closing of the wounds due to sap flow or the drying of surface cells in the vascular cambium. This factor is aggravated or enhanced with low humidity and drought conditions. High humidity and plenty of moisture in the soil are the best conditions for pruning.

Even time of day can affect the plant's response to pruning. In the morning when temperatures are cool and the plant is turgid, there is less adverse effect to the plant.

Time of the year also comes into play relative to plant response. For example, pruning a pine at any other time than when the candle growth is immature may result in eventual death of branches. Pruning of plants in early spring encourages new growth, while pruning in mid-summer controls new growth. Pruning too late in the summer can encourage new growth on the plant, risking freezing injury.

Further, if the plant is used in the landscape for the benefit of its flowering, one needs to know when the flower buds are set. Most plants flowering in spring to early summer will set the flower buds the previous summer and fall. These plants need to be pruned within weeks after flowering in order not to remove next year's flowers.

Most plants that flower in late summer to fall set buds on new growth as it develops. Pruning these plants in the spring will not affect the flowering. A good rule of thumb on flowering woody plants is to prune immediately after they flower. One is least likely to have a loss of the flowering by following this rule of thumb. This also ties in with question No. 1 — what is the plant?

9. When does it flower?

This refers back to knowing what the plant is and the purpose for which it is being used in the landscape. As discussed under question No. 8, it is important to know when buds are set on the plant to be pruned. However, "pruning immediately after the plant flowers" does not mean the very next day after the petals fall. Typically, there is a period of up to six weeks during which pruning can be done without loss of flowering the following year. This period of time can be shortened due to high temperatures and low humidity, causing the buds to mature quicker.

10. Is the proper pruning equipment available?

What equipment is needed to do a "proper" pruning job? The minimum requirement for necessary tools is a hand pruner and a pruning saw. The hand pruner should be a bypass type of cutting blade for more precise and less damaging cuts. A hand pruner should not be used to cut branches larger than 1/2 inch in diameter to prevent damage to the pruners. See Figure 1.

The pruning saw comes in many shapes, sizes, and teeth configuration. Pruning saws are all different from the basic carpenter's saw in that pruning saws cut by being pulled through the cut while carpenter's saws cut by pushing through the cut. Earlier pruning saws had varying size teeth and a *set* to cut down on drag, remove sawdust from the cut, and to allow the blade to continue cutting through the cut.

Newer pruning saws have little or no *set* as the back of the saw blade is thinner than the blade area. These saws also cut in either direction due to the configuration of the teeth. See Figure 2.



Figure 1. A hand pruner with a bypass type of cutting blade. This pruner should not be used to cut branches larger than 1/2" in diameter.



Figure 2. Newer pruning saws have little or no "set" as the back of the saw blade is thinner than the blade area. These saws also cut in either direction due to the configuration of the teeth.

Another pruning tool that can be used is loppers for the in-between size branches ranging from 1/2 inch to 1-1/2 inch in diameter. Pole saws and pole pruners are used to extend the operator's reach without using a ladder or climbing into the tree. Finally, the powered chainsaw, typically used for branches more than 4 inches in diameter or for total removal of the plant, is sometimes required.

11. Is the pruning equipment sharp?

Sharp tools are essential for proper pruning. Pruning with dull equipment causes tearing of the wounds, rough and jagged cuts, and poor wound closing. Poor wound closing allows pathogens and insects to enter. The ultimate result of this can be damage or loss of the plant that is pruned.

Furthermore, using dull tools is harder, more tiring, and more work for the person doing the pruning.

12. Is the pruning equipment sanitary?

When was the last time that the saw or the pruners were sanitized? If the purpose of

pruning is to remove diseased branches, are the pathogens of that disease being spread by pruning?

Many times the person doing the pruning is the plant's worse enemy as far as spreading disease organisms. Fungi and bacteria are commonly spread by pruning equipment.

Chlorox and alcohol solutions are easy to mix and use. A Chlorox solution should be in a 1 to 10 proportion, while alcohol can be used in a 100% solution. Placing the pruning tools into the solutions between plants will prevent passing the disease organisms from plant to plant.

Sanitizing the saw or the pruners does add time to the pruning process, but, as a professional, one should be improving the plants through pruning, not making the problem worse.

One caution with the use of a Chlorox solution is that the person doing the pruning should be prepared to lubricate the hand pruners and loppers regularly as this solution will corrode the tools. A

light oil put on the pruners daily will help prevent this from happening. It may mean that the pruners should be disassembled and coated with oil on a weekly basis to prevent corrosion in the moving parts of the pruners.

13. What obstacles are in the area?

Always be aware of the surroundings when pruning. It is critical when pruning trees and often even when pruning shrubs. Some of the obstacles to be aware of in the area are utilities, above and below the ground surface; other plants; children, pets, and their toys; wildlife; vehicles and buildings.

The non-moving obstacles are generally quite visible before starting to prune, but the person doing the pruning will always attract an audience. This audience may be adults, children, or pets who move into the area after work starts.

14. What is pruned out first, second, and third?

Once the plants to be pruned are known, the purpose for pruning decided, the proper tools selected, and the area cleared, it is time to start the actual pruning process. The first materials removed from the plant are the dead branches. This is commonly classified as *dead-wooding*.

Secondly, the next plant parts to be removed are any diseased branches or insect-damaged branches. Be sure to sanitize the pruners when doing this pruning. Also included in this group of pruning material would be any hazardous, hanging broken branches.

The third step in pruning is to remove any crossing and or rubbing branches. This pruning step in tree pruning could be classified as crown thinning. These wounds on the branches, over time,

become hazardous or become an entry for pathogens and insects. .

15. How are the large branches removed?

Larger branches are removed by a three-cut procedure. This prevents tearing back of the bark which would offer easy entry to pathogens and insects. Further, the three-cut procedure improves and speeds wound closing.

The first cut is on the lower side of the branch to be removed. This cut is at least six inches from the trunk or the connecting branch. This cut is no deeper than half way through the branch to prevent pinching of the saw. This is illustrated in Figure 3.

The second cut is made on the upper side of the branch, two to four inches beyond the first cut and toward the end of the branch to be removed. This allows the branch to be cut off without pinching the saw or tearing the bark back to the trunk. See Figure 4 (top photo).

The third cut is then the removal of the remaining stub to the proper distance from the trunk or connecting branch. This is illustrated in Figure 5.

16. Where are the branches removed?

As illustrated in Figure 5, the branch is removed at what is called the *branch collar*. This is the swollen area at the base of the branch where it attaches to the trunk or to another branch. The branch that is removed is also cut at a 45- to 60-degree angle to the branch bark ridge. The purpose of cutting at these locations is to provide the best potential for wound closing and the least chance of pest entry.

Tree paint is no longer recommended to seal wounds as the environment behind the paint becomes ideal for decay



Figure 3. A three-step process is used to remove larger branches. This prevents tearing of the bark which allows easy entry for pathogens and insects. It also speeds wound closing. The first cut is made 6 inches from the trunk (or a connecting branch) and on the lower side. This cut is no deeper than half-way through the branch.

organisms. This results in loss of structural continuity and integrity.

Pruning of smaller branches that do not require a pruning saw should be done with as much care as with larger branches. Smaller branches are cut with an angle cut approximately 1/4 inch beyond the bud or node. Do not leave long stubs that become entry points for disease organisms. However, do not cut so close to the bud that as the bud develops into a new branch the point of attachment becomes weak.

Prune to a bud that will develop in the direction the plant is to be trained. For a plant that is to develop a spreading habit, the bud selected to prune to should be

pointing outward from the plant. The opposite selection is done when slowing the spread of a plant and trying to develop vertical growth.

The person pruning should orient hand pruners or loppers to prevent leaving a stub.

17. What will the plant look like when it is finished?

The person pruning should have a mental picture of the desired appearance of the plant when it is finished. He or she should also know when he/she has reached the point of completion so the plant will look like this mental picture. If pruned



Figure 4. The second cut (top photo) is made on the upper side of the branch, two to four inches beyond the first cut and toward the end of the branch. This allows the branch to be cut off without pinching the saw and without tearing the bark. The bottom photo shows the tree after the second cut.



Figure 5. The third and final cut removes the remaining stub at the *branch collar*, the swollen area at the base where the branch attaches to the tree. This cut is made at a 45- to 60-degree angle to the branch bark ridge to allow for wound closing and to reduce the chance of pest entry.

correctly, the plant should not look as if it was heavily pruned. There should not be visible cuts, if at all possible. Foliage should be hiding most of the pruned areas.

18. What will the client see when the pruning is completed?

Unfortunately, if the person pruning has not explained and prepared the client prior to completion of the pruning process, the client may see the finished product differently than the pruner sees it. Success is when the client sees a well-shaped, healthy plant that does not scream out that it has been pruned. See Figure 6.

19. Will the plant “heal” its wounds?

Plants do not “heal” as animals do when wounded. Plants compartmentalize the wound or enclose and isolate the wound.

Consequently, proper pruning techniques must be followed.

Proper pruning will result in callusing over of the wound on the outside as well as the inside. If this process does not take place, plants decay on the inside and become hollow. This may eventually result in the plant, especially trees, becoming hazardous.

20. Will the pruning have to be done again and how soon?

This depends on many factors. One factor is how extensive the pruning was in the first place.

Many times, severe pruning stimulates growth and suckering due to stored nutrient reserves. Many trees will be stimulated to send up long shoots from



Figure 6. Successful pruning results in a well-shaped, healthy plant that does not scream out that it has been pruned. And successful pruning produces a finished product that pleases both the client and the person who has done the pruning.

wounds and adventitious buds on old trunks. These will need to be removed to prevent the plant from producing unwanted branches.

The same is true if the plant is a fast-growing plant producing much growth each year. Pruning may be needed very soon after the initial pruning. An example of this would be privet. It is pruned as a hedge, and it seems that within weeks, the plant needs to be pruned again.

The season of the year can affect how soon the plant will re-grow. If pruned during the dormant period, re-growth is slow. Yet, pruning in early spring can bring on much new growth, and if thickening the plant was not the goal, it will be necessary to prune again.

In conclusion, pruning is not just a process of cutting branches when the mood hits a person. It should be a well-thought-out process. By asking these 20 questions prior to picking up the pruning equipment, one

may find that pruning is not the solution to the perceived problem in the first place. There may be other maintenance and environmental factors that must be taken into consideration.

Pruning is only one of many items in a holistic approach to plant care. Through

following these 20 questions, one should achieve a plant that is well manicured, an asset to the landscape, providing benefits to the client and hopefully living a natural healthy life. Pruning of plants should improve the value of the plants and their environment, not degrade plant health and beauty.

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