

PRUNING PAULOWNIA



The Pruning is good for Paulownia due to the big number of dormant buds even on the relatively old woods that are able to become active and to develop when it is necessary. In the cases when the wood will be used for decoration this fact allows their shaping as tall majestic trees or like small bushes. Removing the top of the branches or the top of the stem makes the lower buds to grow and promotes the formation of dense and compact tree. Trees could be permanently pruned it the time of the growing season in order to get fodder.

Paulownia pruning for timber production.

The purpose of this activity is to raise the value of the timber by getting much cleaner timber (without knots) and if they are not removed they will be small and compact.

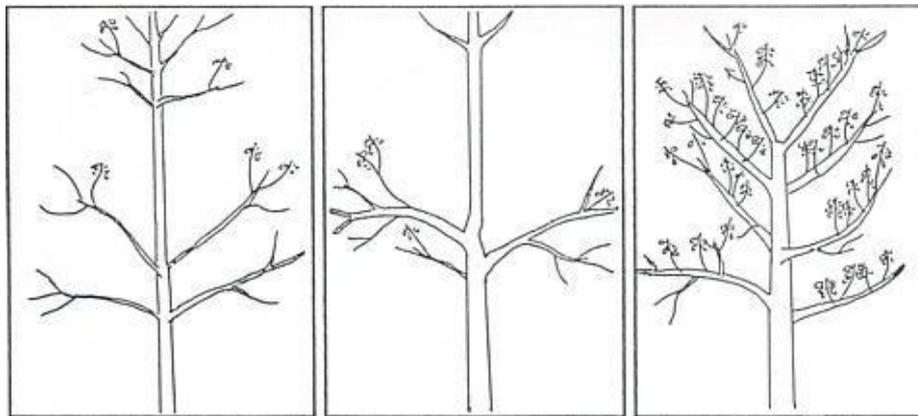


Figure 1

Figure 2

Figure 3

NATURAL FORMATION OF THE STEM

The different types of Paulownia could vary according the growth of the stem and they could be divided into three categories:

1) PERMANENT GROWTH: P. FORTUNEI, P. TAIWANIANA

During the winter the buds at the top of the stem placed between the first and at least to the third internode will die. In the spring a couple of lateral buds will develop vertically upwards. One of them is stronger and her development is to the top in order to shape the continuation of the stem whereas the other (weaker) will develop horizontal or slightly inclined. Sometimes in a warm climate, *P. fortunei* do not loses its top during the winter and the stem will develop from the top bud. This result is a perfectly straight stem. [Figure 1]

2) DISCONTINUED GROWTH HAPACTBAHE: P. ELONGATA, P. FARGESII, P. AUSTRALIS

During the winter the buds at the top of the stem between the first and the third internode will die. The first two, three years after the first growth of the stem, the tree will develop thoroughly its lateral branches. From the third to the fourth the continuation of the stem of the sapling happens by the formation of a new stem from a bud at the base of the lateral branch. Sometimes several vertical new stems will form near the base of the side branch. In such cases the stronger (that is close to the main stem, from which it will continue) has to remain and the others shall be removed. [Figure 2]

3) INSUFFICIENT NATURAL GROWTH: P. TOMENTOSA, P. KAWAKAMII

Again, in the winter the buds at the top of the stem between the first and at least to the third internode will die. After one or two years of a good stem growth these species begin to grow primarily through lateral branches and this will continue also during the third and the fourth season. Even if there is a formation of buds for the recovering of the main stem, most of them are badly located and they do not grow significantly. Pruning is really important in the formation of a good stem. [Figure 3]

It is important to note that the up mentioned comments are concerning the basic directions for the stems of the natural species and it is not necessary to be exactly repeated in their branches or hybrids.

INDUCTION OF A LATERAL (SIDE) BRANCHES.

In the beginning of the second season the stem, in few weeks after the growth resumption it's necessary to implement an examination of each tree, does it from correct growth from the top of a new stem. Usually it is necessary to push the growth of side branches. When the upper lateral branches reach 10-20 cm in length the most powerful and straight among them will be chosen for the continuation of the stem. The outgrowth against it and the next following couples will be removed in order to limit the concurrence. Sometimes the best outgrowth does not develop from the side buds of the wintered highest knot. In that case all the new outgrowths above it have to be removed. Part of the stem top, that has died in the winter gradually dies and the best is to be left for removal few months later when the new stem is tight in order not to be damaged.

UPPER PRUNING.

From the second year after the stem growth resumes it is necessary gradually to remove increasingly the unwanted branches, keeping in mind that one third of the tree height has to be covered with branches with leaves. Excessive pruning could cause the trunk sunburn and will inhibit the normal formation of the crown and thereby will slower the growth in a diameter of the stem.

CORRECTION OF BROKEN OR DAMAGED STEM

In cases of broken or damaged stem it is most appropriate to cut the tree at a ground level and to regenerate a new stem.

The following methods are applicable when the trunk is not too damaged or is close to the time for cutting.

If the trunk is splitted, branching or snapped in the winter the whole crown should be removed by cutting on an angle exactly above the nearest internode. Figure 4.

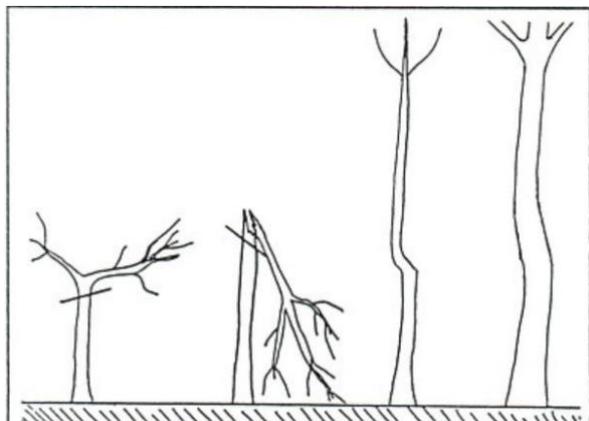


Figure 4. Removal of the damaged crown and new stem formation

DON'T PRUNE EXCESSIVELY!

The rule -one third of the tree height shall not be pruned)

The young plant will successfully cover itself with enough leaves without many branches due to high e photosynthetic capacity and very large leaves. When the stem is in its second year of development the leaves are getting smaller and the lateral branches covered with leaves will be of great importance for the absorption of enough sunlight and for the stabilization of the stem. If is necessary an additional pruning in the next years to reach the appropriate height of the stem without knots, should implement gradually pruning, making sure that at least one third of the tree height is covered with branches and leaves. Usually the removal of the lowest branches is not a hard task and it has to be done from late summer up to early winter by reaching 2-3cm diameter. This prevents the formation of large knots in the wood.

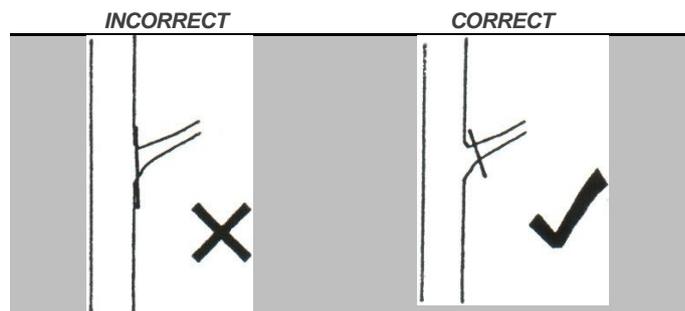
The crown shall not be removed only when the top is broken. In that case you have to cut at an angle about 1cm above the dormant bud and under the damaged place. The following 2 to 4 couples from the lateral branches will be removed. Usually there is more than one bud developing. The most powerful one among the first two bud couples shall remain and the others shall be removed. If you choose a bud from the second line the unwanted part of the stem above it shall be subsequently removed in an angle, which slopes at an opposite direction of the one of the new stem developing.

PRUNING OF THE CROWN

Pruning of the crown includes dilution of the unnecessary lateral branches and the unwanted vertical growing shoots. This process reduces the competition in the formation of the stem and improves the penetration of light and other substances to the branches. In this way after or during the stem growth a new crown is formed higher than the previous one as usually the lowest branches are being removed at the age of two or three years. It is important to leave enough branches to assure foliage for photosynthesis.

After once the target height of the stem has been achieved, pruning of the crown is unnecessary and it will not be useful for the tree productivity. Pruning is necessary if only there is a need of fodder for the animals or for achieving better illumination of the crops under the trees if there are such planted.

CUTTING POINT WHILE PRUNING The illustration demonstrates the correct manner for cutting, when a branch has been removed. When it has been cut too close to the stem the following healing will delay and it will create a larger gap (defect) in the wood.



The cut is too close to the stem and it will cause large wound, that will heal difficult.

The good positioned cut leaves a "shoulder" that will heal easily.

NECESSARY INSTRUMENTS. The funds for pruning have to be well maintained in order to ensure pure cuts. The instruments are from small scissors to heavy saws according to the application. For height pruning it is recommended a saw (scissors) for pruning positioned at extender rather than scissors with long handles for a easier and more precise operation, pure cut and correct positioning. Paulownia is not difficult for cutting and it requires a minimum effort. According to the height of the pruned stem and the size of the operator up to a certain height it can be done without double ladder but only per extender for the scissors. For higher cutting it is recommended to use specialized equipment.

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This document is only a guide. The data for its completion includes various sources and experiments according to the specific land conditions(climate, soils) that are not under the control of the author. The authors could not guarantee the accuracy of the consequences of the above instructions.

HOW HIGH SHALL WE PRUNE?

In generally the most valuable timber is with the length of 2.40 or more. That means that it is necessary to reach the MINIMUM of 2.50 meters for the stem. This could be easily achieved for Paulownia even with the minimum for pruning. If you can get longer logs you will provide the opportunity for longer beams and boards that depending on the purpose could be advantage or disadvantage. If the trunk is longer than the intended final product it can be always cut, but it is good to know in advance what are the lengths that the customer requires, so the trunks could be grown to identical lengths. Basically 5 meters trunk is a reasonable length that provides the opportunity for the formation of material from two heights of 2.40 m or one 4.80 m. Quite often a mistake occurs by considering that higher pruning will lead to more wood yield. This is correct for long-term tree cultivation, but the exposure to direct sunlight of the stem could cause damage, the winds also and the tree itself will need more time to acquire wood to a volume appropriate for cutting. Paulownia needs to develop large crown of foliage before the stem starts to grow. It is ways better to own a plantation consisted by short wide trees than a pole from pegs.

