



PAULOWNIA ECOLOGICAL REQUIREMENTS

1) **TEMPERATURE.** Paulownia can adapt to a wide range of temperatures. Provided they have adequate soil moisture (see below) they can cope well with a summer maximum of 45°C. Species vary in their cold resistance. *P. tomentosa* is the most cold hardy and can survive temperatures of around -20°C, *P. elongata* -15°C., *P. fortunei*, *P. kawakamii*, *P. australis* and *P. fargesii* -10°C, and *P. taiwaniana* can withstand 0°C. In general the optimum temperature for growth of trunk diameter and height is around 27°C. The longer the optimum temperature is sustained the better the growth. It should be noted that while the Paulownia has an impressive tolerance to a wide range of temperatures a late frost - after the tree has come out of dormancy - can cause injury. Also a hot day very early in spring - before sap flow - can result in serious sunscald (usually on the west side of single trees or the west outside row). In excessively cold winters the Chinese wrap the trunks of saplings with grass or paint them with soaked lime to prevent freeze injury. Saplings can be protected from sunscald by painting the exposed side, but it is better simply to avoid over-pruning young trees to allow the branches to provide natural shade protection.



2) **WATER.** As Paulownia are indigenous to regions that receive summer rainfall it is essential that they are watered well during the warmer months if rapid growth is to be achieved. A good deep soaking every 7 to 21 days during their first summer is usually sufficient and generally better than light frequent sprinklings in encouraging a good root system. (The exception to this is if you have shallow soils with a hard clay pan and high water table - in this case more frequent shallower watering may help to encourage the roots to stay within their most viable zone - any that go too deep will only rot in the wet season.) If a drip irrigation system is used it should be left on long enough to thoroughly soak the depth of the root area. Observation and common sense are the keys to correct watering. Obviously sandy soils will need more than heavy loams, but over watering in sand will result in wastage and leaching of nutrients out of the root zone. It is also important to note it is normal for Paulownia to wilt during a hot day - this is a mechanism for avoiding excessive transpiration. If the trees are wilting because it is hot, but the soil is moist *don't water them* or you may cause collar rot. Paulownia are sometimes referred to as drought resistant as they will survive dry conditions. It should be

pointed out however, that while they can survive without much water, under dry conditions growth is slow or they will drop their leaves and become dormant, waiting for rain. As the weather cools in autumn watering should be gradually phased out to ensure the trunk becomes well lignified before winter.

3) **SUNLIGHT.** Paulownia require full sun to achieve maximum growth. The branches and leaves of the mature tree are sparsely arranged to allow high light penetration. Shade on one side can distort the shape of the tree to a level where it's timber value is greatly reduced. Experiments carried out by the Chinese Academy of Forestry have shown that above 70% shade can be fatal.

4) **WIND.** Paulownia, particularly young plants, benefit greatly from protection from severe winds which can break off or damage leaves and branches. In some cases, even the trunk may be damaged. Wind protection can be provided by planting a windbreak of fast growing trees such as *Virgilia*, *Tagasaste* or willow (which are also useful fodder trees) or even some other fast growing timber tree such as an *Acacia* or *Eucalyptus* - a gap of at least 12 metres should be left between *Eucalyptus* and Paulownia trees as *Eucalyptus* can out-compete Paulownia for water, nutrients and light.

5) **SOIL.** Soils can range from light clay to sandy, preferably deep and must be well drained with a water table deeper than 1.5 metres. The pH in their natural distribution can range from 5 to 8.5 for *P. tomentosa* and *P. elongata*, 4.5 to 7.5 for *P. fortunei* and *P. kawakamii*, 4.5 to 7 for *P. australis* and *P. taiwaniana* and 4.5 to 6.5 for *P. fargesii*. While Paulownia are quite tolerant of low levels of salt, they should not be planted commercially in salt affected areas as growth may be poor.



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PROBLEMS, QUERIES, COMMENTS, SUGGESTIONS.
Telephone (03) 5983 5688 [international +61 3 5983 5688] preferably between 8:30am and 5:30pm Australian Eastern Standard Time, Monday to Friday, or any time any day send facsimile (03) 5983 1999 [international +61 3 5983 1999] or email help@toadgully.com.au Visit our web site at <http://toadgully.com.au> or <http://paulownia.com.au>

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