

CLIMATIC CONDITIONS FOR GROWING PAULOWNIA



TEMPERATURE AND ALTITUDE

Paulownia can adapt to a wide range of temperatures. Generally Paulownia species grow up to 2000m. The development starts in the spring, when the soil temperature reaches 15-16°C. Intensive cultivation of Paulownia is optimal up to 700-800m and the optimal temperatures suitable for maximal growth are in the range of 24-33°C.

SOILS

Paulownia is highly adaptive species and grows well on many types of soils. Most appropriate and recommended are light, well drained and sandy soils with or without slopes. Most recommended are deep well drained soils with pH from 5.0 to 8.9. Avoid clay, rocky and soaked soils. Soils that are consisted from over 25% of clay and porosity under 50% are not recommended for Paulownia. Paulownia does not tolerate salinity over 1%. Young Paulownia plants develop well, when the soil depth is at least 1.5-2 meters.

RAINFALLS

Soil and air humidity are very important for Paulownia growing. Additional watering is necessary if the annual rainfall drop under 100mm per month. In comparison 10mm of rain delivers 10 liters of water. Watering is needed in the following years if the monthly rainfall is under 50mm. Insufficient watering slows the growth but does not kill the plant. For optimal growth during the first months of development is crucially important to water them with 20l per plant weekly. The quantity is good to be divided in two equal times and added by drip irrigation system. The establishment of drip irrigation is recommended technology when develop commercial plantation for Paulownia.

WIND

Plantation is good to be planted at areas without strong winds reaching over 28km/h. When there are stronger winds at the place of planting stabilizing post has to be put during the first year of development until they form strong wooden stem. The speed of the wind is dangerous for the young plants over 45km/h and such areas have to be avoided.

COMMON CONDITIONS FOR ESTABLISHMENT OF PAULOWNIA PLANTATION

SITE PREPARATION

Usually Paulownia is planted during spring and mid-summer in dependence of the development stage of the planting material /one year old saplings or young planting material/ and prefers horizontal or south orientated slopes. As all young trees, Paulownia plants should be well protected from herbivorous animals. Site preparation operations will depend on the roughness and vegetation of the planting site. Old fields and meadows typically require herbicide treatment to control weeds and brush. When the weeds are strong early in spring an herbicide treatment has to be applied carefully to avoid contact with the tree stem.

MACHINERY CULTIVATION PRIOR PLANTING

If the fields are not explored for agriculture and the soil is not cultivated it is absolutely necessary to plough it deeply (minimum 40-60cm). The purpose is to fragment it in small pieces and to uproot the old grasses and bushes. If the soil is heavier and with clay you have to plough deeply up to 80cm. After plough the land have to be leveled up with harrow. After that operation the land is considered ready for furrow and marking and making of holes for planting. In dependence of the soil quality defined from the preliminary soil analyses at the place of planting the soil is enriched with manure or different fertilizers.

PLANTING SCHEMES AND DENSITY



PAULOWNIA FOR TIMBER PRODUCTION

When creating a plantation for timber we recommend the planting scheme with 4x4, 5x5 meters or 5x4 m between the trees which means 500 or 600 trees per hectare. Larger density leads to competition for area between the trees and slower their growth after the first 3-4 years. Lower density leads to faster initial growth which lowers the timber quality. Higher density does not lead to commercial effect, the necessity of elimination of plants is connected with expenses for eradication and herbicide treatment to stop the regeneration from the roots and in the end the 3-4 years old stems does not possess enough volume to be used for timber.

PAULOWNIA FOR BIOMASS

For effective yields we recommend the trees to be planted with higher density than the one used for timber production. The density should be between 3500 and 10 000 plants per hectare which depends on the rotation cycles of for the biomass collection strongly linked with the purposes of the biomass (pellets, chips, bioethanol, fodder) and the harvest machines

KEY FACTORS

- Soil analyses to define the clay content and microelements and to evaluate how suitable it is for growing Paulownia and how to be cultivated to establish highly effective plantation;
- Land cultivation is critical for adaptation of the saplings at the site and to ensure sufficient growth;
- Weed control is the most important aspect from the preparation of the land for planting;
- Irrigation is an advantage if summer rainfalls are insufficient