Planting trees

Planting-hole preparation, planting and anchoring

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Planting-hole preparation and soil improvement

Digging the planting hole

The correct measurements for a planting hole are at least one and a half times the width of the root ball and five to ten centimetres shallower than the height of the root ball. A planting hole should be dug carefully. This is usually carried out using a machine, in which case it is important that the sides of the hole are not smoothed down. When working with wet soil and clay or loamy soils in particular, the sides can quickly become smoothed and sealed, so that new roots are unable to penetrate. In this case, the sides of the planting hole should be loosened. If the planting hole is created using a crane digger, a toothed bucket should be used, to prevent smoothing and sealing. The soil in the planting hole must be dug over well to allow deeper root development and encourage capillary rise of groundwater. The dug-over layer should then be pressed down again to prevent too much subsidence of the ground, and therefore the tree. Note that soil should not be dug over below the highest groundwater level. Stay at least fifteen centimetres above this.

Space for root development

The space the tree gets in the planting hole is not the final space the root system will fill. The final space for root development is of course much larger. This must be taken into account during development of the plan. This space can generally be calculated using the following rule of thumb: space available for root development = 0.75 to 1 m³ per square metre of crown surface area. A tree taller than 15 metres will grow around a square metre per year in crown surface area, so an extra cubic metre of topsoil or tree soil will be needed each year for the root development. When setting up the growing location, it is therefore also crucial to factor in the lifespan of the tree. A horse chestnut, for example, can grow to be eighty years old in its growing location. This tree will therefore require eighty cubic metres of space for root development. An ornamental cherry tree between six and ten metres tall will only grow to be thirty years old, will not have such a large crown surface area and therefore only requires fifteen cubic metres of space for root development.

"Invest in a good growing location. A small tree in a good planting hole is better than a larger, more expensive tree that impacts on the budget available for preparation of the planting hole"

Soil improvement

Urban environments often don't have the best soil in which to plant trees. The soil can be compacted by construction and it may also contain too few nutrients due to an increased (building) sand content. Depending on the soil at the location and the function of the area, there are various ways to improve the soil.

Compacted soil

In some cases, the soil around a planting hole may be compacted, which means that the soil has been pushed down by pressure. A mixture of different soil types can increase compacting. The roots of a tree cannot penetrate compacted soil as there is no oxygen present. This creates a 'flower-pot effect', the roots can only find oxygen and nutrients within the planting hole itself. This can continue to cause disappointing results years after planting and even result in the death of the tree. If the planting location and surrounding area are found to be highly compacted during planting, the soil will need to be loosened by being turned over using a crane digger.

Preparation of the planting location with tree sand or tree gravel

This method for preparation of the planting location is often used for trees planted in paving, as tree sand also forms a good foundation for streets. Tree sand is made up of sand mixed with organic material. It's not an optimum growing medium but rather a compromise mixture, which combines the requirements a tree makes of the soil with civil-engineering requirements in connection with subsidence. Tree sand can be used under cycle paths and footpaths. If further compacting occurs, under parking areas and streets with low driving speeds, for example, tree gravel is a better option. This material consists of volcanic lava, has sufficient nutritional value for the tree and can bear the load of cars. When tree sand and tree gravel are used, the volume should be at least one and a half times the space calculated for root development in topsoil.

Improvement with fungal-dominated humus compost

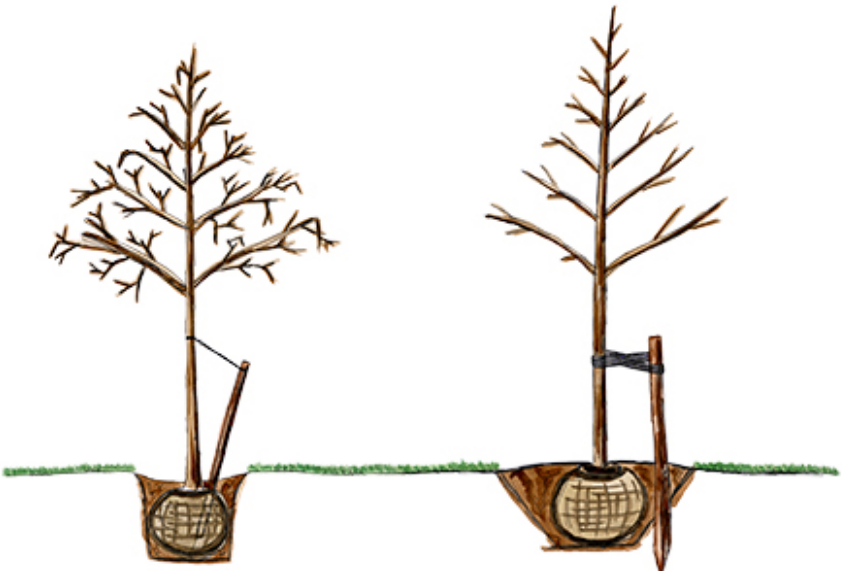
Forests are an optimum location for trees. The forest soil contains a high humus content and a complex variety of soil life, including many micro-organisms, such as fungi. Soil improvement using fungi-dominated humus compost recreates the optimal location for trees as closely as possible and enriches the biological soil activity, which eventually ensures that nutrients are made available for the tree. A maximum of ten percent humus compost can be mixed with poor soil to create a good growing medium.

Planting trees

The planting season

The planting season for trees starts as soon as they begin to drop their leaves in the autumn and ends when the new buds begin to swell in the early spring. Exceptions to this include a number of specific circumstances:

- Planting does not take place if the ground is very frozen.
- Planting does not take place if there is a lot of snow.
- Planting does not take place if the ground is so saturated that water collects in the planting hole.
- Planting does not take place if there is a risk of structural deterioration of the soil.



incorrect *correct*

Planting trees

Not too high, not too low

After the planting hole has been prepared and any soil improvement carried out, the tree can be planted. The trunk of the tree should be wrapped in jute, after which the tree can be lifted using a sling around the root ball and trunk or a root hook. The tree should be placed in the planting hole with the top of the root ball around five to ten centimetres above ground level. This is because the soil in the planting hole will sink a little, particularly in the case of heavy trees. The tree will sink with it and will end up standing lower than the planting height.

It's better to plant a tree too high than too low. Trees that are planted too low have a high chance of being deprived of oxygen, which in turn is linked to root rot and dieback. Since the roots of a tree grow to just below ground level, planting too high is not desirable either. Trees that are planted too high dry out easily, since the roots end up sticking out above ground. Adding a little mound of extra soil to cover the roots can also lead to drying out, as the water flows off the mound during irrigation.

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Filling a planting hole in three steps

Once the tree has been placed in the planting hole, aeration first needs to be installed, particularly in the case of paved soil and soil with a lot of organic material, such as peat. This aeration is necessary to ensure oxygen reaches the roots. Once the aeration has been installed, the planting hole can be filled.

1. The planting hole is first filled a third of the way up and this soil is pressed down. Make sure that no organic materials, such as sods, end up in the planting hole, as these materials remove oxygen.
2. The planting hole is then filled three quarters of the way up and the wire attached to the root ball is detached at the top. If there is a wire close to the trunk, there is a risk that the tree will be pinched at this point when it begins to get thicker.
3. The planting hole can then be filled completely and pressed down again. Never remove the wire around the top of the root ball before the tree is placed in the planting hole, as the risk of the root ball collapsing is too high.

Protecting the tree trunk

For species with a thin, smooth bark that are planted in a sunny location, trunk protection is usually necessary during the first phase after planting. Beeches, limes, hornbeams, pagoda trees and common maples are particularly sensitive to sunburn, resulting in the bark coming away from the trunk. This can be prevented by wrapping the part of the trunk that is free of branches in jute after planting. After a few years, this jute will have disintegrated and the tree will have developed resistance to sunburn. The spread of the crown will also have increased, casting more shadow on the trunk.

Anchoring trees

Anchoring trees

Once the tree has been planted, it must be anchored, to ensure it does not start to bend over or rock as well as to prevent new root growth being damaged by the tree moving too much. There are two anchoring methods.

1. Anchoring above the ground, with one or more tree stakes and bands.
2. Root-ball anchoring or anchoring below the ground.

Anchoring above the ground using one, two or three stakes

Anchoring above the ground

Anchoring above the ground using one or more tree stakes and bands is the most common method. This type of anchoring remains in place for three to five years, until the tree is sufficiently anchored itself, through its stabilising roots. The stakes and bands are then removed.

If a single stake is used, this must be placed on the prevailing-wind side. The tree will then 'sway' in the opposite direction to the stake. If this rule is not observed, the tree will sway towards the stake too often and damage could be sustained, through which parasites can enter the tree. In the case of whirlwinds or downwinds around tall buildings or larger trees, more stakes will be required. If three stakes are used, the advantage is that an irrigation barrier can be attached to the stakes, so it remains in place better. Make sure the bands are not attached too firmly, a little slack encourages root development and better anchoring in the long run.