

# Try to plant lime, Czech national tree

long way from seed to young tree



Lime tree is a deciduous broad-leaved tree species, naturally distributed across the Europe, except the northernmost and southernmost areas. There are two species of lime origin in the Czech Republic, more frequent small-leaved lime (*Tilia cordata* Mill.) and large-leaved lime (*Tilia platyphyllos* Scop.) which is less common. The importance of lime in the Czech forestry is rather marginal, it occupies only about 1 % in the tree species composition. Lime mostly occurs as an admixture in the riparian forests or on the steep rocky slopes.

On the other hand, lime is important tree in the landscape greenery, it is commonly used in alleys along roads and in streets and parks). As a solitaire the crown and stem can reach large dimensions. For its longevity, lime is often declared as memorable trees. During the prehistoric times and in the middle-ages, the Slavic and also the German nations worshiped oaks (*Quercus*) as the sacred trees. Lime is considered as a national tree only from the half of 19th century for Slavic nations within the former Austro-Hungarian monarchy. During the 20th century, lime become the national tree of Czechoslovakia, and then of the Czech Republic.

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The wood of lime is very light and soft, convenient for woodcarving. Lime trees bloom about in the second half of June and the blossoms are very important pasture for bees and they are used in the traditional medicine. The fruits ripen in the autumn. They have a form of a dry nut, very thin and easily cracked open. In contrast with *Tilia platyphyllos* with the tough nuts, hard to crack.

The seeds have so-called dormant character. The seed dormancy is the status that the vigorous seed do not germinate until the pre-sowing treatment (stratification) is done. This is a natural strategy of many plants in the temperate vegetation zone. The dormancy prevents the premature germination of the seeds during the autumn after they ripen. In the nature, the spontaneous stratification is passed of when the seeds lay on the soil surface, mixed with the fallen leaves, sometimes under the snow layer. This strategy ensures, that the seeds do not germinate in the autumn, but only in the spring.

In case of lime, the warm-cold stratification is usually used to overcome the dormancy. In the warm stage, seeds are stored in the room-temperature (about 20 °C) for at least one month, better 60 to 90 days. This warm stage (when embryo matures) is followed by the cold stage to remove the chemical inhibitors of germinating. In the cold stage, the seeds are stored in the cold (but not freezing) temperature (about 2–5 °C) for the time of several months (120 to 180 days) until the seeds begin spontaneously germinating. Then the seeds can be sown into the soil. The crucial is to keep the appropriate moisture for both stratification stages. The seeds must be moist but not wet or submerged in water. On the other hand, while lime seeds tolerate total drying before the stratification process, after that the stratification launch, the seeds are quite sensitive to drying. Slight decrease of moisture causes a stop of the stratification process. Total drying of seeds during both stratification stages may cause irreversible damage of seeds.

First two leaves of young lime seedling call cotyledons which are considerably different in shape from the leaves of older trees. Cotyledons have a shape resembling the palms with fingers, in contrast with the regular heart-shaped (cordate) leaves. Despite the well-done pre-sowing treatment, the germination rate (the percentage of germinated seeds) of lime seed lots usually do not exceeds about 30 %.

### 《Pre-sowing treatment instructions overview》

Lime seeds usually do not germinate without the special pre-sowing treatment to overcome the dormancy. The pre-sowing treatment consists of two stages:

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### Step1. The warm phase.

Seeds are stored in the room-temperature (about 20 °C) for at least one month, better 60 to 90 days. During all the time, the seeds must be kept in the appropriate moisture. Seeds must be only moist but not wet or even submerged in water! It is appropriate to mix the seeds with substrate, i.e. sand or peat (not fertilized). Choose the place out of the direct sun-light and with the gentle air flow to reduce risk of mildew. Periodically (once every 3-5 days), it is necessary to check the substrate and to add the water which evaporated before, and to loosen up the substrate to aerate it. If the mildew occurs, it is possible to use some commonly accessible fungicide. The container with the substrate can be covered with some breathable textile, not with the impervious plastic film.

### Step 2. The cold phase

Seeds are transferred into the refrigerator where will be stored for several months (120 to 180 days) until some of seeds spontaneously germinate. The temperature must be in the range of about +2 to +5 °C. Periodically (once every about 10 days), it is necessary to check the substrate, aerate and add water, if needed. The substrate can be inserted in the plastic bag, which must stay partially opened (not close it hermetically).

When the first seeds start to germinate, the seeds can be sown into the moist substrate or soil and store in the room temperature, like common room flowers. The gentle amelioration with artificial fertilizers is recommended several weeks later, after the cotyledons fall off and the next (regular) leaves replace them.

**Please share your thoughts on the poems or how the seeds are growing on social media with hashtag [#RobotPoet](#) !**

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