

HOW

TO PLANT A NEW FOREST



FOREST PLANTING

Age group: **Basic school - Seniors**

Forest planting is a method of artificial forest regeneration, i.e. the targeted planting of seedlings, transplants or sowing of tree seeds in order to replace the mature stand (old growth) with new trees.

- **Artificial forest regeneration by sowing** sowing is close to natural regeneration. Advantage of this method is that the foresters do not have to raise transplants. However, the success of seed establishment is lower than in the transplants, not speaking about the fact that emerged seedlings require much more care. Forest can be regenerated by sowing only with some tree species, e.g. oak, beech and fir. Before the seed is put into the ground, it has to be properly prepared. Even seeds in the nature need seed dormancy before they emerge, which ensures that the seeds will germinate at the right time when the saplings will have the best chance to grow.



Emergence of oak seeds on a forest clearing.

Photo: Archives of the State Forests of the Czech Republic, state enterprise



Beech seeds prepared for treatment.

Photo: Archives of the Secondary Forestry School in Hranice

Before the sowing, seeds are moistened, rubbed down by sand to disrupt their husks, soaked in chemicals and water of diverse temperatures, stored in peat or in the cold environment. Only then, they can be sown and let emerge. High-quality and treated seeds from trees coming from the same or similar environment are sown into the pre-treated soil in spring or in autumn according to the selected tree species.

TYPES OF SOWING:

- ▶ **Broadcast sowing** is demanding for soil preparation. It requires the sowing of large seed amounts and the result is uncertain.
- ▶ **Point sowing** is used on plots where not many weed herbs and woody plants have emerged yet and is suitable for large seeds (acorns, chestnuts); so-called „sowing under hoe“.
- ▶ **Pinch sowing** – is similar to the point sowing and is used for smaller seeds.
- ▶ **Strip sowing** – seeds are sown into furrows or strips by using sowing machines or by hand.
- ▶ **Spot or nest sowing** – seeds are sown into a small dish-sized hole, either to the centre or across the whole area of the hole, depending on the seed size.



- **Artificial forest regeneration by planting** – is the planting of seedlings or transplants raised in the forest nurseries. The selection of appropriate tree species and appropriate site so that the trees would do well in the forest and natural species diversity would be preserved at the same time requires a lot of knowledge and experience. The forester has to know the type of soil, mean precipitation amounts and temperatures, must consider slope, terrain and altitude. The forester's task is to choose the species composition with taking into account conditions in the regenerated forest stand.

Each new forest stand has to contain a certain percentage of soil-improving and reinforcing tree species to enhance stability and resistance of the stand against wind and water (beech, maple, alder, larch ...). Forest management plan, which is a law for the foresters and is approved in regular 10-year intervals also by state authorities responsible for the environment, includes the precisely given tree species and their percentages. Precisely specified is also the number of plants per hectare. The forester has to follow all these criteria when choosing the proper method and technique of forestation.

Seedlings and transplants used for planting in the forest must be of good quality (size, quality, vitality), i.e. they cannot be ill or weak) and must have a proof of origin (have to come from the same natural conditions). Sometimes, the forest can be regenerated also by cuttings, short twigs, planted right into the ground; this applies namely to poplars and willows.



Containerized plant.

Photo: Archives of the Secondary Forestry School in Hranice

The type of transplant is chosen according to the site. Bare-rooted plants (without soil) can be used on sites with favourable conditions and on large areas. On sites that represent a risk for the bare-rooted plants (stony or drought-prone soils, low nutrient content, poor quality soils), we use containerized plants. The containerized plants have a dense root system in soil and thanks to that, they are less susceptible to weather and become established better. Nevertheless, the production and handling of containerized plants is more expensive.

TYPES OF PLANTING:

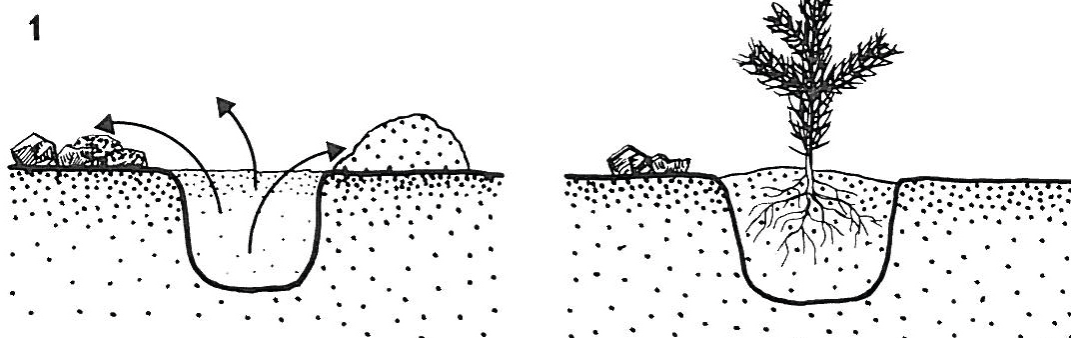
There are many types of forest tree planting. Which of them the forester will choose, depends on the specific site and tree species. Most commonly used types of planting are as follows:

- ▶ **Hole planting** – for transplants with the branched root system
- ▶ **Slit planting** – for transplants with the taproot system
- ▶ **Mound planting** – transplants are planted into raised mounds
- ▶ **Furrow planting** – transplants are planted into ploughed furrows

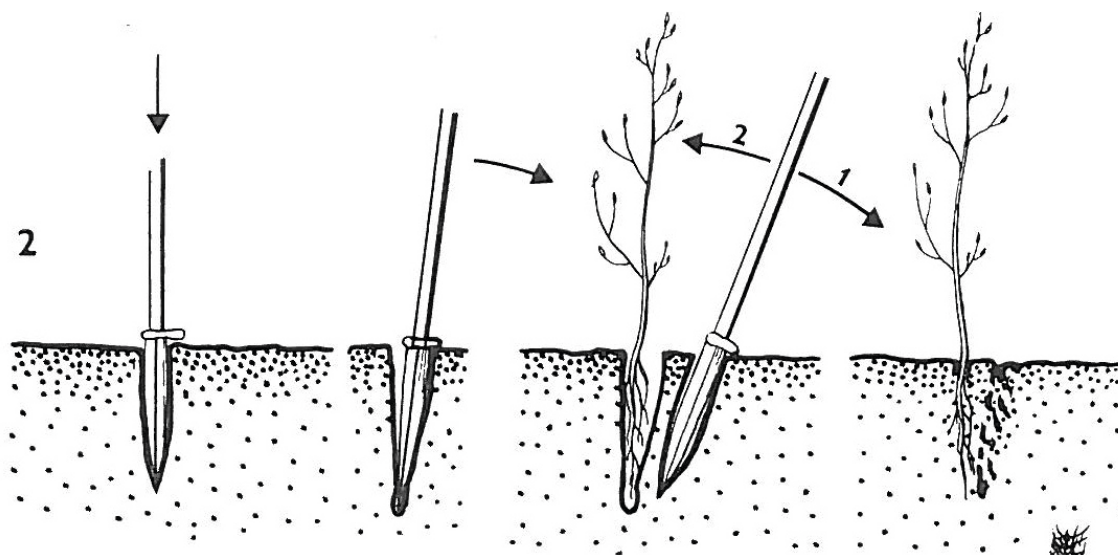


Stock for transplanting.

Photo: Archives of the Secondary Forestry School in Hranice



Hole planting - Fig.: Archives of the Secondary Forestry School in Hranice



Slit planting – Fig.: Archives of the Secondary Forestry School in Hranice

Planting is made either manually by forest workers or mechanically by machines.
Aids for reforestation by planting: hoe, axe-hoe, thin planting bar (štychar), planting rods.



Afforestation machine – demonstration of its work on a clearing
Photo: Archives of the Forest Management Institute, Czech Republic



Children from Vysočina help foresters plant a new forest – using axe-hoes, they plant containerized beech transplants
Photo: Archives of the Forest Management Institute, Czech Republic

THEMES FOR ACTIVITIES



- **Demonstration of forestation with the forester in the forest stand.** Do not forget to take along a card with your name to inform visitors to the forest who will have forested the plot. Forest pedagogy with the forester in the forest: www.lesnipedagogika.cz / Kontakty.
- **Forest regeneration by sowing – spreading of seeds.** This activity is best to do in the forest where the forester will explain individual growth stages of the forest and can show to children forest stands of diverse ages. In collaboration with the forester, the teacher will throw a handful of seeds into the air (their number corresponding to the number of children). The child will squat where the seed has fallen and rises with the growing seedling (seed – squat, seedling – kneeling position, self-seeding – trunk bend, advance regeneration – stand, coppice – arms at a mild distance from the body, small pole stage – arms raised sideways with elbows bent at an angle, pole stage – arms outstretched sideways, high forest – arms above the head). The teacher together with the forester explain why some saplings die and some are removed by the foresters from the advance growth to decrease its density, or in the pole-stage stand by operations called cleaning and thinning in order to achieve a good quality forest stand.

- Motivation for talking about forest regeneration can be the French novel **Man who planted trees** from 1953 by Jean Gion.



Copy the picture of workers in reforestation and let the children fill it with colours. Open a discussion: Why is there a forester overseeing the work of others? What the man is doing in the machine at the background? Why the transplants prepared for reforestation down on the left are covered with earth? Source: Archives of the Forest Management Institute, Czech Republic

EVENTS IN THE FOREST ● WITH THE FORESTER ● ABOUT THE FOREST

www.lesnipedagogika.cz