

THE STRONGEST
AND MOST BEAUTIFUL
FOREST CHAMPIONS,
PARENTS OF TREES FOR
THE FUTURE GENERATIONS



SEED PRODUCTION

Age group: **Primary schools**



Parent tree.

Photo: Archives of the Secondary Forestry School in Hranice.

Seed production deals with the collection, storage and pre-treatment of seeds that are to be used in the cultivation of seedlings and transplants in forest nurseries. The raised saplings will be then used for artificial regeneration in the forest to replace the cut trees.

SEED SOURCES OF FOREST TREES

- **Parent trees, forest stand** – Cones and some seeds (maple) are picked directly from the tree with the use of ladders, cranes and telescopic towers. Some trees can be climbed with using the climbing spurs. The picking from the high-grown trees is very dangerous and only experienced pickers can do it. By contrast, some seeds are collected fallen on the ground under the trees (oak, beech). Healthy and vital trees, which are particularly suitable for the collection of seeds or scions are marked in the forest with two yellow stripes on the trunk and are called parent trees.

The felling of trees can be accommodated to the term of seed collection so that the cones can be picked directly from the cut trees lying on the ground. Low-grown trees and shrubs we usually shake to catch their seeds on a sheet spread on the ground.

- **Seed orchard** – In nature you can see strangely shaped coniferous and broadleaved trees growing at a greater distance from each other as if in a fruit orchard. These trees serve to produce seeds and scions of forest trees and many a time they help to preserve some rare woody plants. Scions for these seed orchards are obtained from high quality and resistant parent trees.

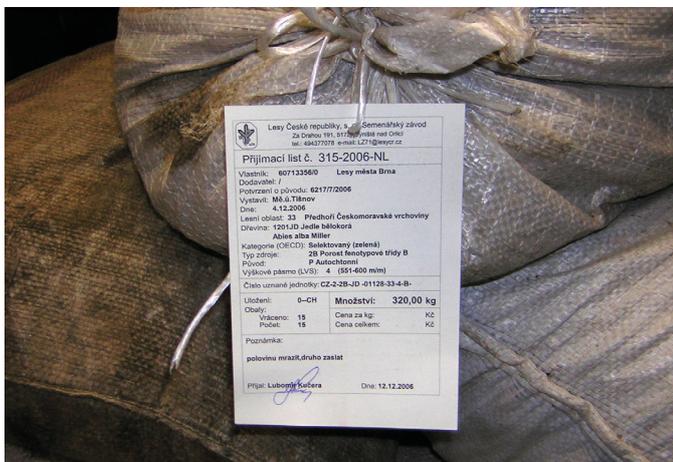


Collection of scions in the seed orchard.

Photo: Forest Management Institute, Czech Republic archives.



- **Husking of cones** – The seeds of coniferous trees are hidden in the cones. Some cones fall into pieces directly on the trees (fir); other ones fall on the ground in the whole. The method used to extract the seeds from the cones is called husking. In nature, the process occurs spontaneously and gradually due to temperature changes and humidity. At high temperature, the cones become open and the seeds fall out. Pulpy fruits become gradually decomposed. Birds and other wildlife often take part in the husking of cones. Cones collected by humans are husked by tossing, rubbing and temperature changes in the cone-drying kiln. The seed production plant in Týniště nad Orlicí supplies husked seeds for the whole Czech Republic.



Each lot of cones/fruits delivered to the seed production plant for husking is properly labelled; especially important is to know from which forest region and from how good parent sources it comes.



Husking of beech seeds.



Husked seeds of Scots pine.

Photo: Forest Management Institute, Czech Republic Archives and Secondary Forestry School in Hranice



- **Storage of seeds** – Seeds obtained by husking have to be properly stored not to dry out or catch moulds. Seeds of different tree species need different temperature, humidity and ventilation when stored. Some of them are stored in packages, some are kept in heaps, other ones are stored in mixture with sand, and some are even frozen. Seeds can be stored for a short time but also for more than a year. Husked seeds must return to sites and conditions from where they came in order to preserve the respective ecotypes of forest trees. This is why they are kept in seed banks together with the proof of their origin. In the Czech Republic, there is only one seed bank, again in Týniště nad Orlicí. A seed bank in the open nature is the soil and climate, which protect the seeds before their time of germination occurs.



Storage of seeds in the seed bank of the Czech Republic.
Photo: Archives of the Secondary Forestry School in Hranice.

- **Pre-sowing treatment** – Before the seeds are put into the ground, they have to be pre-treated. Even the seeds in the open nature enjoy a period of seed dormancy before they germinate. This is how the germination at the right time is ensured when the sapling has optimal conditions to grow. Prior to sowing, the seeds are moistened, rubbed down by sand to disrupt their husks, soaked in chemicals and water of varying temperatures, stored in peat or exposed to damp and cold conditions to unify the term of germination. Only then, they can be sown and left to come up.

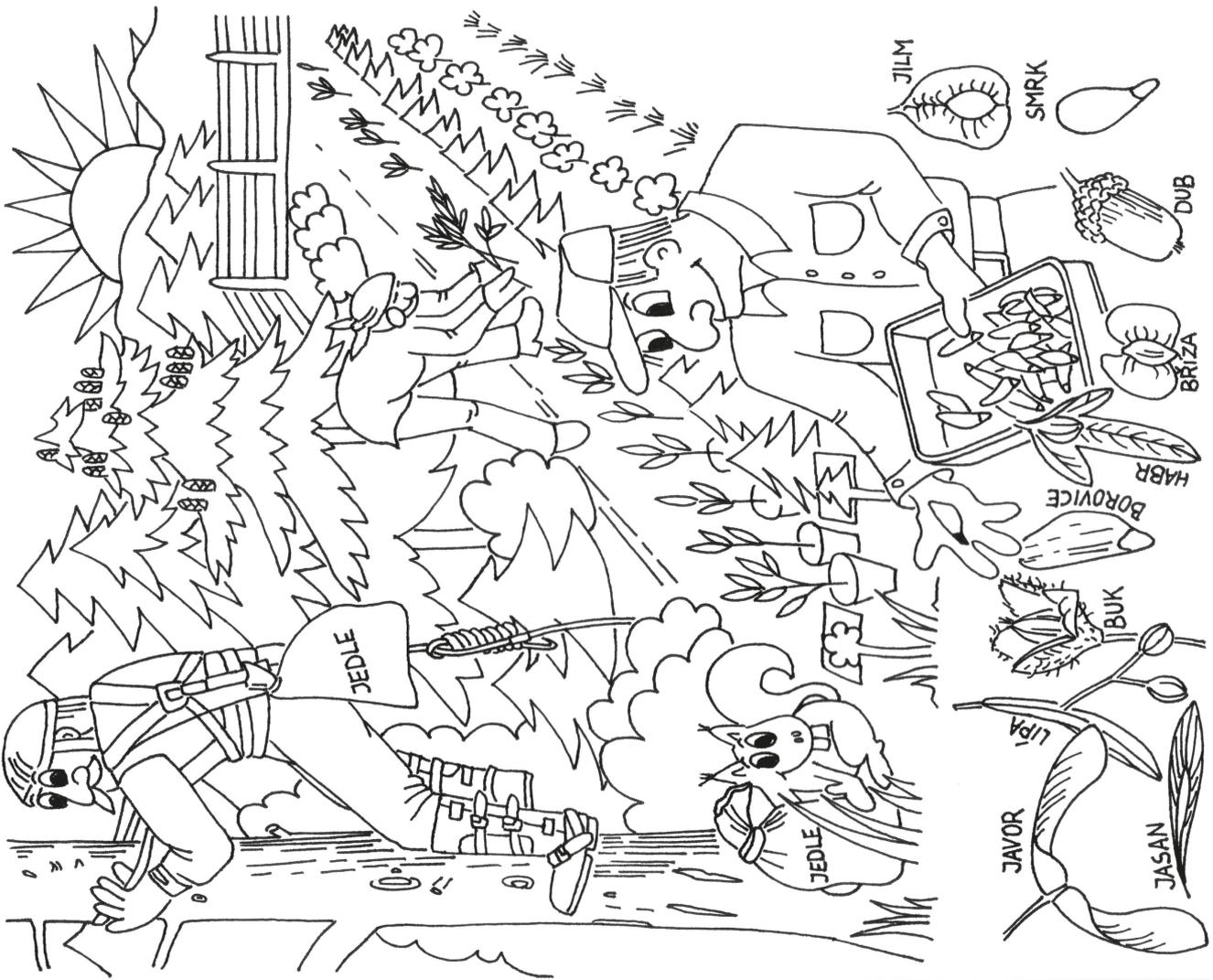
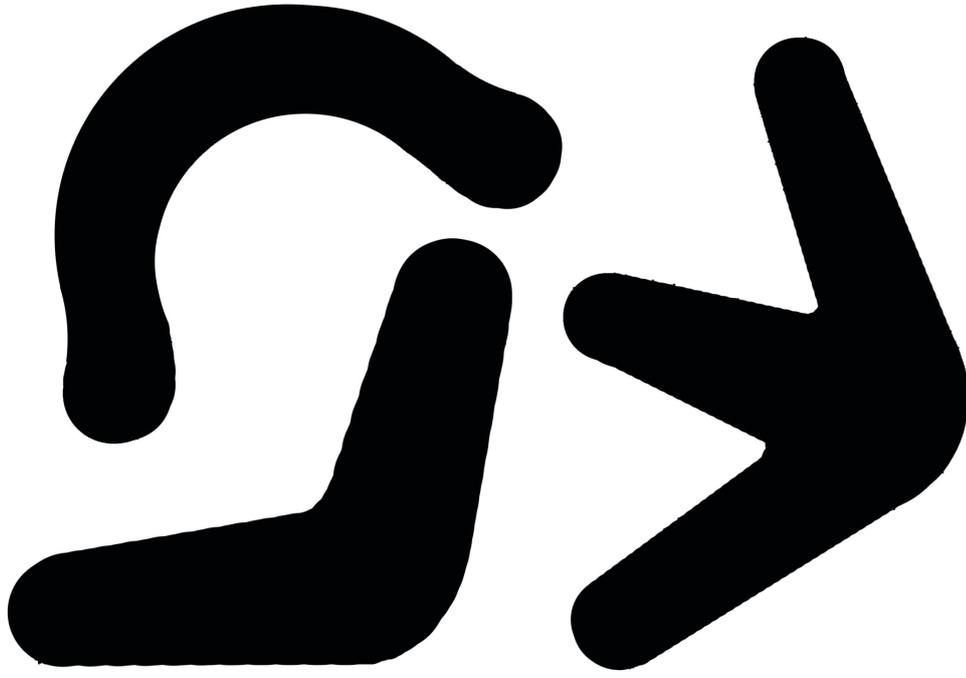
THEMES FOR ACTIVITIES



- **Visit to seed orchard**, parent trees, snow cache, husking of cones.
- **Assigning seeds to leaves and fruits** – Children will have cards with the pictures of tree leaf, fruit and seed or a natural material. They will fix them on their chest by using a peg or string. Groups of three children look for one another to complete together the parts of one tree species. Aids: cards with the pictures of leaves, fruits and seeds, pegs or strings, possibly bags with the seeds or fruits, specimens of leaves. Limited amounts are available at the Secondary Forestry School in Hranice, or you can collect them in the forest or park.
- **Cutting out seed boomerangs** – Demonstration of the seed flying mechanism. How the seed can get onto the ground from such a height of the tree crown? Chestnut falls down directly, beechnut may slightly deflect from the axis, maple makes a spiral when falling down and the seed of birch flies several metres before settling down somewhere... Children will simulate the flying seeds by means of cutout paper boomerangs (*on the backside*).
- **Smuggling of seeds** – Teacher will choose 2-3 smugglers whose task is to obtain a rare seed. Other children pass the seed over to each other so that the smugglers cannot get hold of it. Children who do not have the seed pretend passing it over to confuse the smugglers. The smugglers try to find out where the seed is.
- **Listening game** – Non-transparent boxes are filled with several seeds. By listening to the sounds of shaken boxes, children try to find two boxes with the same contents. Seeds should be chosen of different size and shape so that the sounds they give when the boxes are shaken are different too.
- **Testing germination** – Put a piece of moistened absorbent paper in a jar or a plastic cup, cutout according to its shape. Place on the paper 25, 50 or 100 seeds. You can use seeds that you have husked by yourself from the cone or even peas bought in the shop. Check how many of them will germinate. Determine the seed germination percentage by the size of the cutout.
- **Observing germination** – Children will collect acorns in the park or in the forest. Each of them is to be placed in a plastic cup. Now, the children will wait for the acorns to germinate. The seed should be placed to a depth, which is approximately equal to its size. Then they observe the young seedling to come up, which can be later planted in the forest or elsewhere after agreement with the department of the environment or with local foresters.



Instructions: Put the boomerang cutout of hard paper onto the back of your hand clenched into fist and knock it from the side with using a pencil or a stretched finger of your other hand.



Copy the picture of the picker and let the children fill it with colours. Open a discussion: What the men and the woman in the picture do (picker, forester, forest nursery worker). What tree species has the cones upright? Source: Forest Management Institute, Czech Republic archives