

WHY TO PAMPER THE FOREST



FOREST REGENERATION

Age group: **Secondary schools**

Forestry as a field of human activity deals with the maintenance and improvement of forests. Forest has a range of important non-wood-producing functions for nature and society. It impounds, channelizes and slows down water in the landscape, protects soil against erosion, maintains air humidity, mitigates temperature fluctuations, affects the environment, preserves natural wealth, beautifies the landscape, and is home to the animals and plants. Moreover, the forest provides to humans its produce such as forest fruits, fungi, venison, and timber as a renewable raw material. Financial earnings from commercial activities in the forest, e.g. sales of wood, serve also to fund the construction and maintenance of forest roads, treating of small streams, structures for the relaxation and enlightenment of visitors to forests. Thus, in terms of sustainable forest management, the task of a forester is to ensure the continuous supplies of renewable raw material, and at the same time, to keep balance between the felling and planting of trees so that the forests are preserved in good condition for the future generations.

The process of replacing the existing, as a rule mature (timber) forest with a new generation of the forest trees is called FOREST REGENERATION. Forest regeneration is one of the basic tasks of foresters.

- **Regeneration in primeval and natural forests** occurs spontaneously in a long-lasting process of the decomposition of trees, which died due to age, fire, wind disasters, insect pests or due to other reasons.
- **Regeneration in commercial forests**, which represent a majority in the Czech Republic (although more than a half of the Czech forests are operated under some regime of protection), is a set of tending measures leading to the formation of a new stand in the place of the old stand. Foresters regenerate the old forest either by supporting natural processes, by artificial methods, or by a combination of the two.
- **Natural regeneration utilizes** reproductive capacity of the parent stand for the emergence of a new forest generation, which comes to existence either from the fallen seeds, from the coppice shoots or from the root suckers. In the commercial forest, natural regeneration is connected with the purposeful activities of forest managers. The forester intervenes in the forest regeneration in line with the site requirements, requirements of the regenerated tree species and other factors – e.g. by soil preparation (soil scarification to facilitate germination of seeds and establishment of seedlings), weed control, opening up of the parent stand (by cutting some trees in order to increase light treat in lower forest storeys) etc.
- **Artificial regeneration** is a method of intentional activity of the forest manager. New stand comes to existence through the planting of seedlings and transplants raised in forest nurseries or through the sowing of seeds and fruits.



Artificial regeneration. Photo: Archives of the Secondary Forest School in Hranice



Currently, forestry attempts at a combination of these two methods of natural and artificial regeneration, always taking into account specific requirements and potentials of regenerated stands. The selection of tree species for reforestation must correspond to natural conditions of the given site. They are listed in the forest management plan that all foresters have to follow and that is approved also by the nature conservation authority. The task of the forest manager is to choose the appropriate composition of tree species, i.e. site-specific tree species and the percentage of their mixture with respect to natural conditions in the regenerated stand.

Preparing the forest stand for regeneration

When and which stand is to be regenerated is not decided by foresters themselves. Interventions in the forest are set up in the forest management plan, which has to be always approved also by the nature conservation authority. Foresters see to that no excessive damage is done to the forest or its stability disturbed (regeneration should for example always proceed against the direction of destructive winds). This is why a system of lines (paths) has to be built in advance, through which the extracted timber will be hauled from the forest stand. For the natural regeneration to be successful, foresters have to prepare favourable conditions. In the period before the coming seed year (forest trees do not give fruits each year but once in three to five years), they open the stand by cutting some trees in order to provide more light and moisture to seeds lying on the ground. Often they have to fight against vegetation that prevents the intended regeneration such as blackberry and raspberry bushes, alder buckthorn, elderberry and some other shrubs or grasses such as reeds, common mat grass etc.

When the trees reach the felling age, i.e. the time when they become most suitable for felling due to ecological, biological and economic reasons (in our forests it is about 120 years while in tropical forests, it may be only 20 years), the time comes to start with forest regeneration.

- **Cut under the protection of the parent stand** – is an ideal example of near-natural forest management. Uneven aged trees at diverse stages of development are together in one stand. Selected for cutting are undesirable trees or trees maturing in different periods.
- **Cut to a clearing** is the type of cutting in which the clearing is to be reforested within two years. The new stand arises on a clear-cut area that must not be wider than a double height of the surrounding stand and larger than 1 hectare (only exceptionally max. 2 ha).



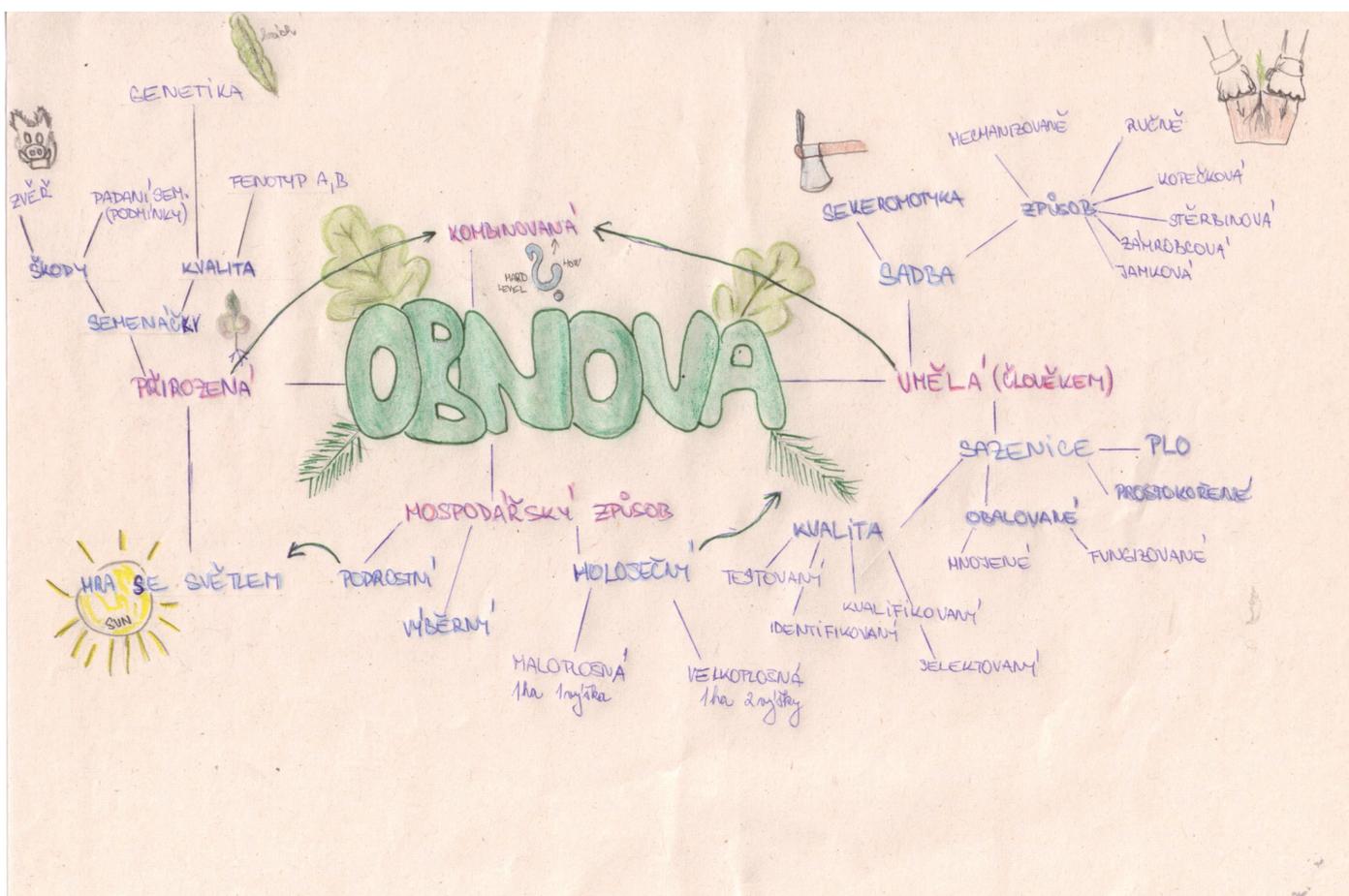
*From the seed factory in Týniště nad Orlicí:
1 kg spruce seeds = 114 thousand seeds = 40 thousand transplants
= 9,000 m³ timber = 330 wooden houses
Photo: Archives of the Secondary Forestry School in Hranice*

THEMES FOR ACTIVITIES



- Forest pedagogy with the forester in the forest:
 - ▶ Forestation – artificial regeneration, forest stand improvement
 - ▶ Monitoring of the viability of transplants on the reforested clearing
 - ▶ Calculation of the spacing of transplants

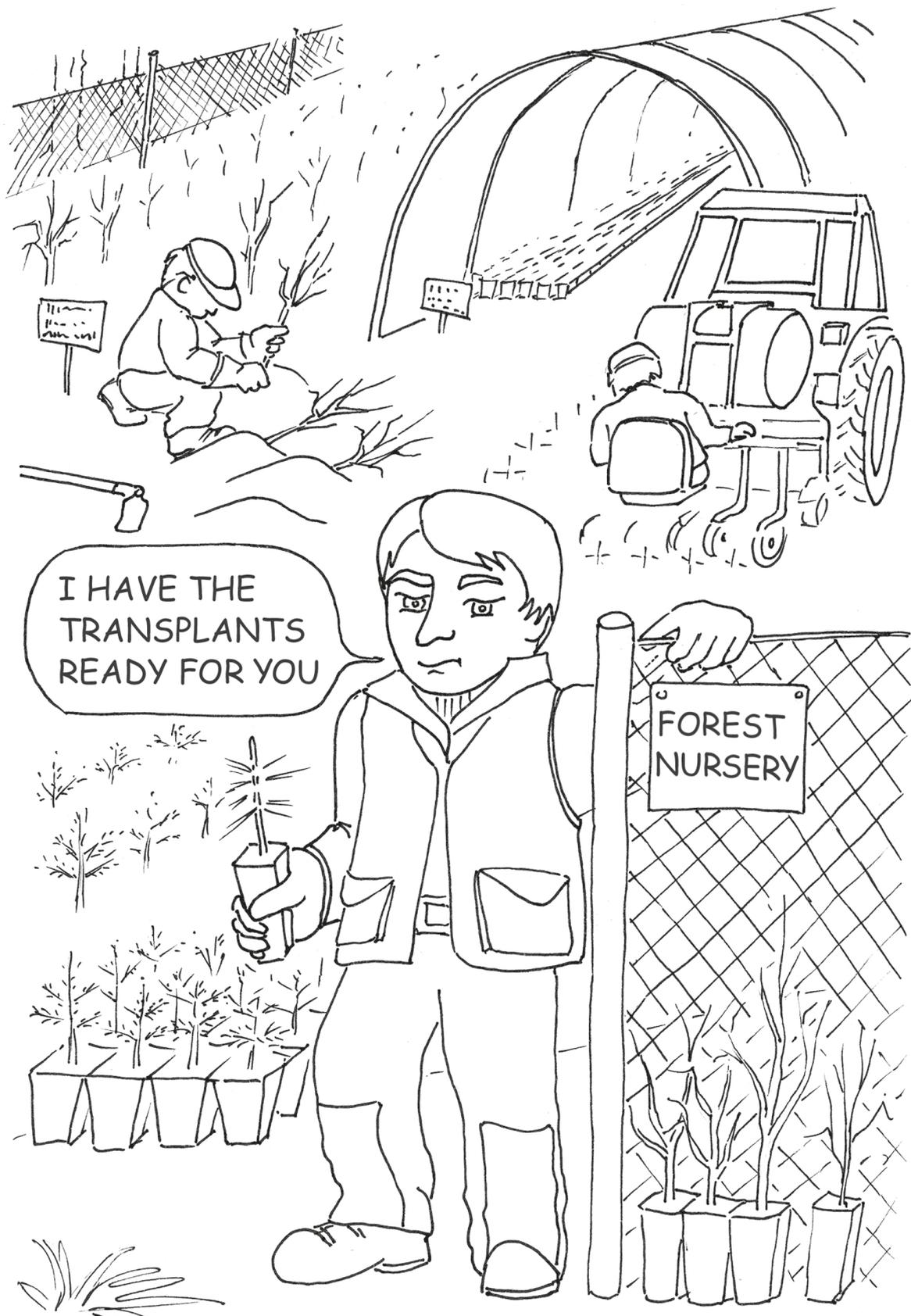
- **Uneven aged forest stand** – The forester explains to visitors that for the regular regeneration of the forest, it is necessary that all age categories are represented therein, which gradually reach the felling age. This is how enough timber as a renewable raw material is ensured and the forest never shrinks. In collaboration with the forester, the teacher gives out cards to pupils in two groups, with the names of various growth stages of the forest. On command, the pupils turn the cards and try to form two rows as quickly as possible. Winning is the group, which was fastest in forming the row. The participants build a row so that the individual growth stages are ordered from the youngest to the oldest one after another (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).
- **Forest regeneration is often hampered by undisciplined visitors.** Students will suggest design and graphics of a poster or a board to discourage the visitors from forbidden activities in the forest (smoking and lighting of fires - danger of forest fire, thefts of saplings, lifting of forest tree seedlings and transplants, forest pollution – litter, wildlife stressed by noise and by visitors moving outside the forest paths often causes severe damage to the forest – ban to disturb peace and quiet, pursuant Forest Law no. 289/1995 Sb. Chapter three – General use of forests §20).
- **Make a cartoon** with the theme of forest regeneration and protection of plantations in the forest. Your works are to be emailed to ovv@uhul.cz – We have a surprise for the authors of all cartoons ☺.
- **Create a conceptual map** on the subject of forest regeneration and protection of plantations in the forest.



Example of a conceptual map on the subject of Forest regeneration.
 Source: Archives of the Secondary Forestry School in Hranice.

- **Brainstorming.** Why do we need wood – give the names some wood-based products and their alternatives of other materials? What is the method of their recycling? How demanding is their production? How do they meet customers' requirements? Which product would be your own choice?





The picture belongs to the working sheet „Children of trees from the forest nurseries“.

Copy the picture of the nurseryman and let the children fill it with colours. Open a discussion: For whom the transplants are prepared? What machines and equipments can you see at the background? Why there are plates at each bed in the nursery – what is written on them?

Source: Forest Management Institute, Czech Republic archives

EVENTS IN THE FOREST • WITH THE FORESTER • ABOUT THE FOREST

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