

REPORT ON THE WHOLE REGION RIPARIAN SPECIES GENE BANK

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Background

Genetic diversity is an important prerequisite for the adaptability of forest tree species to changing environmental conditions. In today's increasingly stressful environment, under the conditions of climate change, conservation of the gene pool of diverse tree species is an important task. Negative pressures on natural ecosystems and certain plant species challenge the stability and sustainability of forests. According to the European report on forest dieback data, annual losses due to forest decline are estimated at two to five billion USD. Losses caused by forest decline are ongoing, occur annually, and are constantly increasing. Therefore, special attention must be paid to both the gene pool conservation and funding for conservation projects. Conservation of genetic diversity is based on two methods: *in situ* and *ex situ* conservation. According to the law on Forest Reproductive Material, the Croatian Forest Research Institute, as an official body, has established a seed bank and a seed saving bank for *ex situ* conservation. It also forms seed reserves and tests the quality and similarity of forest seed materials. The project of financing the seed bank was started in 2009. After the completion of the building in 2013, the seed bank is equipped with professional equipment for seed processing and storage of various forest tree and shrub species. The preparation of the regulations on the quantities of seeds stored for this purpose is in progress. (*Gradečki-Poštenjak, Marija, Dorić, Tena; Seed bank as a way of forest trees and shrubs gene pool preservation method; Book of Abstracts, 10th International Conference 'Laboratory competence' / Grgec Bremec Lovorka - Zagreb : Hrvatski laboratoriji CROLAB, 2014, 71-72*)

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Seed bank within REFOCuS project

According to the Interreg Danube REFOCuS project proposal, the Croatian Forest Research Institute, a project partner will establish a whole Mura Drava Danube biosphere reserve seed bank within the existing facilities. Continuous quality control of existing and new collections from the riparian forests in the region is and will be carried out regularly by the seed bank following the ISTA (International Seed Testing Association) rules.

During the project seed was collected for alder, oak and ash, who had seed years during the three autumns covered by the duration of the project. The seed is and will continue to be stored at the gene bank. Occasional campaigns will be carried out to replenish the collections when the seed vitality declines beyond the minimum threshold.

Table 1: Seed bank capacities at CFRI:

Temperature of storage	Size (amount of seed), approx.	Purpose	Remark
+3°	2000 kg	Small seed, orthodox seed, conifers seed	Amount of seed depends on species and seed size
+5°	20.000 kg	Recalcitrant seed	
-10°	1500 kg	Orthodox seed, intermediate seed, conifer seed	
-15°	1500 kg	Orthodox seed, intermediate seed, conifer seed	

Table 2: Stored seed from PP countries at seed bank:

Species	Amount	Country of origin
<i>Alnus glutinosa</i> Gaertn.	7 kg	Croatia
<i>Alnus glutinosa</i> Gaertn.	6 kg	Slovenia
<i>Quercus robur</i> L.	5 kg	Slovenia
<i>Quercus robur</i> L.	5 kg	Austria
<i>Quercus robur</i> L.	5 kg	Serbia
<i>Quercus robur</i> L.	30 kg	Croatia
<i>Fraxinus angustifolia</i> Vahl.	5 kg	Croatia

Collected seed of *Quercus robur* was sowed in containers for growing seedlings which will be planted in a living archive in spring 2021. Before sowing, the seed was stored on the temperature of +5°.

Alnus glutinosa seed is stored at the temperature of +3°.

Fraxinus angustifolia seed is stored at the temperature of +3°.



Figure 1: Collecting *Alnus glutinosa* seed in the Forest district Kloštar Podravski, Croatia



Figure 2: Stored seed of *Quercus robur* and *Alnus glutinosa*



Figure 3: Seed bank at CFRI, facilities and refrigerators

Clonal archive

Cuttings of *Populus nigra* were sent from all PP to ILFE, where a clonal archive of *Populus nigra* was established. The clonal archive holds 86 cuttings of seven clones from Croatia, 103 cuttings of 11 clones from Slovenia and 134 cuttings of 13 clones from Serbia.

Contact information of the Whole region riparian species gene bank

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