
8 Occurrence, Genetic Identification and Reproduction of indigenous Black Poplars in Bavaria

Summary

Ecology and Range

The European Black Poplar is the only native poplar of the section *Aigeiros* in Europe and Asia. As a typical species of riparian sites along rivers, it is found sporadically along the main European rivers such as the Danube, Elbe, Oder, Weichsel as well as the Loire, Rhone, Po and Rhein. However detailed information of where it occurs is lacking. Furthermore it is difficult to distinguish the native black poplar from the hybrid poplars which have been planted in Europe since the 17th century. A first inventory in the 1990s´ showed that only few indigenous, true black poplars still occur in Germany. Consequently *Populus nigra* was placed on the list of endangered plant species (so called “Red List”).

Causes for the decline can be found in the destruction of habitat along the rivers by man (levis, dams, dredging, lowering of the water table, etc.) which reduced the dynamics of regular flooding which black poplar needs in order to regenerate itself. In addition the intensive planting of hybrid poplar and other species, which are of more commercial interest, reduced the range of native black poplar further.

Project

In 2005 the German Federal Ministry for Agriculture (BMELV) announced a project to make an inventory of black poplar in Germany. Various states (Länder) were asked to register the occurrence of black poplar in the respective States according to a standardized inventory. One year later, in the autumn of 2006, the board of trustees of the “Bavarian Ministry for Agriculture and Forestry” authorized a project entitled: “*Occurrence, genetic identification and reproduction of indigenous black poplar (Populus nigra L.) in Bavaria*”.

Data collection

Between 2006 and 2009 all larger rivers in Bavaria were inventoried and mapped. Smaller streams were only inventoried if there were indications that black poplar was present. To support the phenotypic evaluation of black poplar, DNA samples were taken to verify the specific black poplar genotype.

Numerous institutions were involved in the inventory including the following: Regierung von Oberbayern, Landschaftspflegeverbände (Ammersee, Freising, Bodensee), Bayerische Staatsforsten, Europareservat Unterer Inn (Ering), Fachhochschule Weihenstephan, private mapping agencies as well as the Amt für forstliche Saat- und Pflanzenzucht. Further information was obtained from the following: Ämter für Ernährung, Landwirtschaft und Forsten, County seats, environmental groups (BN) and other scientific organizations.

Results

So far 15,748 black poplars (*Populus nigra* L.) were found in Bavaria (up to March 31st, 2009). Thus Bavaria has 29 percent of the entire number of black poplars found in Germany (approximately 55,000). The southeastern corner of Bavaria (along the rivers Inn and Isar) has the highest density of black poplars in Bavaria. Natural regeneration of black poplar was only found in a few regions. Stem diameter was used as an indicator of age, this indicated that most occurrences of black poplar were “overaged”.

Genetic analysis

Four populations of black poplar were analyzed genetically. The determined values for variability, diversity and the observed heterozygosity were high for all populations. Some of the investigated gene-loci indicate that some alleles only occur along the Main River in northern Bavaria and others along the Inn and Rott rivers in the Danube drainage.

Reproduction

During the mapping phase, material for the vegetative reproduction of black poplar was gathered. With this material a base population was established in the experimental nursery in Laufen, Bavaria. The vegetative propagation was initiated in 2008 and currently contains a collection of over 200 poplar clones.

Furthermore larger populations were identified which are suitable for obtaining seed and thus have material which can be reproduced sexually. Since black poplar is covered by the “Regulations on Forest Reproductive Material” such populations (stands) must be certified in order to allow the collection of seed.