Hybridisation of poplar holds much potential if conservation of genetic resources is integrated in improvement work

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Outline

Importance of tree improvement

Requirements of tree breeders

Gene conservation in *Populus nigra*
- databases EUFORGEN and EUFGIS

Shortcomings and consequences

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Importance of Tree Improvement

The world-wide demand for wood as a sustainable renewable resource is increasing

Tree improvement is viewed as major way to increase wood production

An important contributor to breeding success has been heterosis, e. g. cross breeding distant genotypes which under natural conditions would not come into contact

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Requirements of tree breeders

Thus, breeder require, besides local genotypes crossing partners from distant locations, frequently from other continents where access is limited.

Usually not only access is limited; also information about occurrence and availability doesn't exist.
One reason to create networks and platforms like IPC, which promote and enable exchanges of germplasm.

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Requirements of tree breeders

Focus of breeders

Depending on breeding philosophy, a breeder usually develops precise requirements as to the crossing partners presently needed. Breeders want:

—information on germplasm available

—how to access the germplasm, e. g. holders and in which form it is available (pollen, seed, scions etc.)

Gene conservation in *Populus nigra*

Gene conservation programmes can potentially fulfil these requirements, they should be conceived to consider this information requirement

However, conservation programs usually have different aims, e. g. nature protection, biodiversity, etc.

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Gene conservation in *Populus nigra*

For *Populus nigra*: two databases available:

– EUFORGEN
– EUFGIS

(IPC database on poplar cultivars and any national databases (e. g. France) are disregarded here)

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Gene conservation in *Populus nigra*

The European database on *Populus nigra* clones: www.populus.it

Gene conservation in *Populus nigra*

40 selected P. nigra clones from 20 countries of the EUFORGEN Core Collection :

– the clones are given in the EUFORGEN database (www.populus.it)

– the main clone collection is held at Casale Monferrato (Lorenzo Vietto)

A core collection of *Populus alba* clones exists in Spain at CIFOR-INIA

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Gene conservation in *Populus nigra*

Additionally, currently genotypes of 23 countries are included, totalling 3332 entries.

Major on-line updating: Ukraine, Switzerland, The Netherlands, Czech Republic 2003, United Kingdom, Croatia, Serbia, Austria, Portugal, Bulgaria 2004, Turkey 2005, Spain 2007, and Italy 2010

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Gene conservation in *Populus nigra*

Much new data available from Germany and Switzerland of recent large-scale *P. nigra* surveys

Also a few entries from Iran, Iraq, and China are given

Much of the *P. nigra* distribution range is represented, except for the east

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Gene conservation in *Populus nigra*

Gene conservation in *Populus nigra*

Populus nigra

Populus nigra distribution range
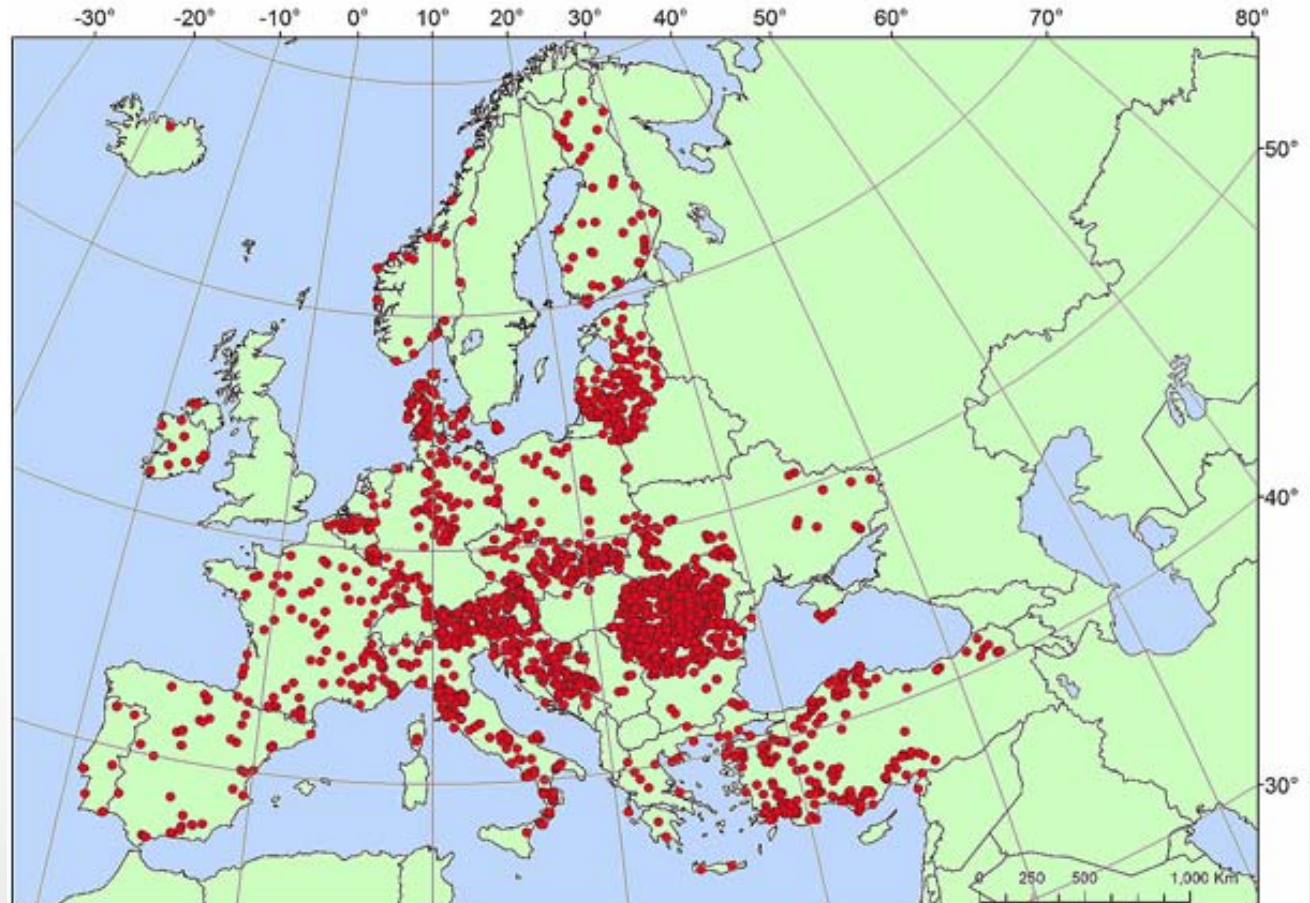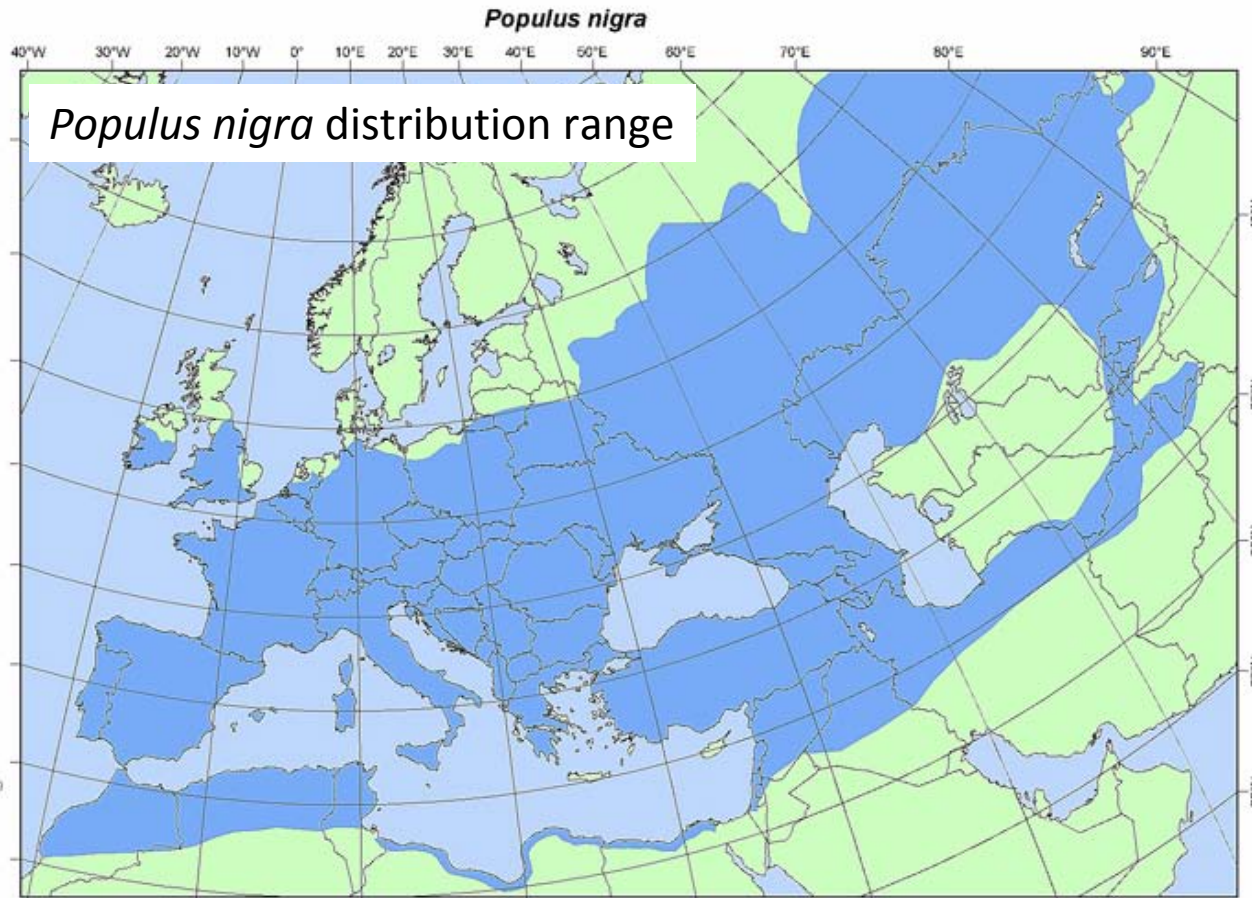
This distribution map, showing the natural distribution area of *Populus nigra* was compiled by members of the EUFORGEN Networks

Citation: Distribution map of Black poplar (*Populus nigra*) EUFORGEN 2009, www.euforgen.org.

First published online in 2004
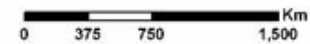
Gene conservation in *Populus nigra*

Data

The EUFGIS database contains information on **3150** gene conservation units and **99** tree species in **34** countries. Each unit is managed for genetic conservation of one or more target tree species. The units harbor a total of **3949** tree populations.

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Gene conservation in *Populus nigra*

Fraxinus excelsior (93); *Fraxinus ornus* (1); *Ilex aquifolium* (3);
Juglans regia (3); *Juniperus communis* (1); *Juniperus excelsa* (12);
Juniperus oxycedrus (2); *Larix decidua* (204); *Liquidambar orientalis* (4);
Ostrya carpinifolia (4); *Phoenix theophrasti* (2); *Picea abies* (470);
Picea orientalis (2); *Picea sitchensis* (1); *Pinus brutia* (62);
Pinus contorta (1); *Pinus halepensis* (26); *Pinus heldreichii* (2);
Pinus nigra (145); *Pinus peuce* (1); *Pinus pinaster* (42);
Pinus strobus (6); *Pinus sylvestris* (311); *Pinus uncinata* (4);
Platanus orientalis (3); *Populus alba* (9); *Populus nigra* (30);
Prunus avium (80); *Prunus cerasifera* (2); *Prunus padus* (7);
Pterocarya fraxinifolia (2); *Pyrus pyraster* (7); *Quercus cerris* (43);
Quercus ilex (6); *Quercus palustris* (1); *Quercus pedunculiflora* (15);
Quercus pubescens (6); *Quercus robur* (294); *Quercus rubra* (15);
Quercus trojana (2); *Quercus virgiliana* (1); *Quercus vulcanica* (2);
Salix alba (2); *Sorbus aucuparia* (27); *Sorbus domestica* (2);

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Quercus rubra (15);
Quercus vulcanica (2);
Sorbus domestica (2);

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Detail page for Unit number: **DEU00140**

Go back to the previous page - Go back to the Search page
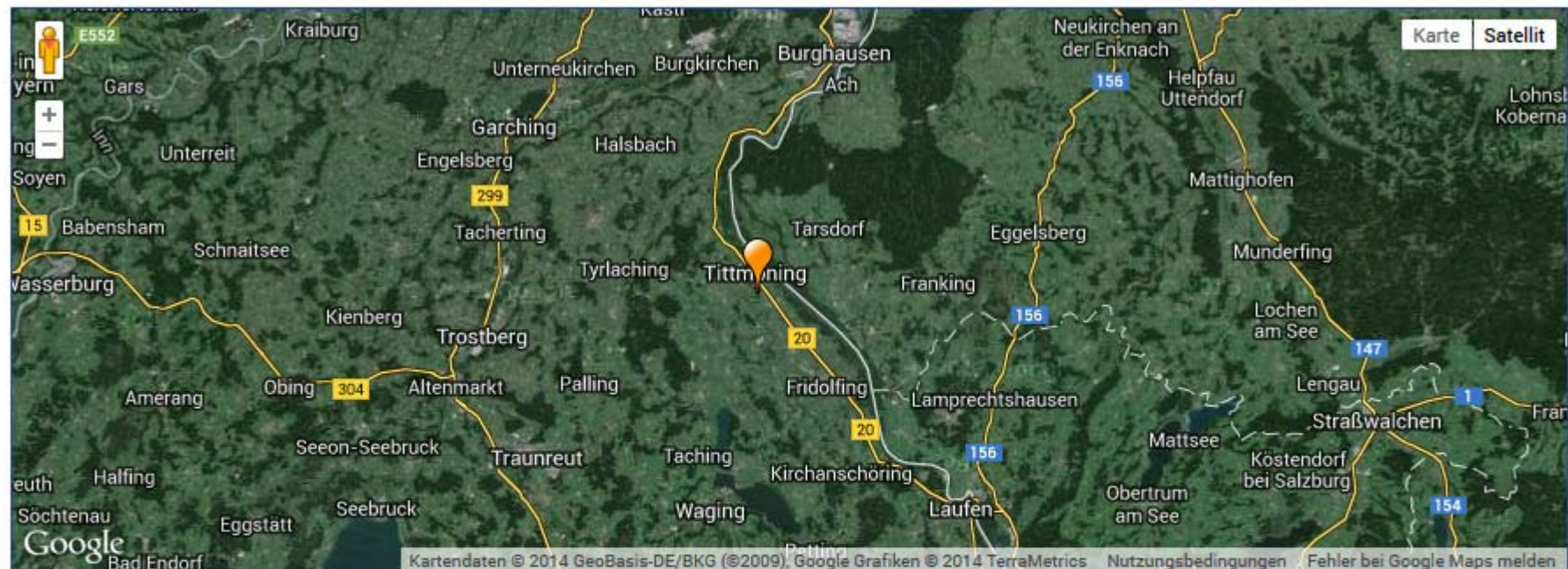
Country of the unit :	Germany
Unit number:	DEU00140
National gene conservation unit number:	IN-POPNI-DEU-05
Province or state:	Bayern
Department or county:	Oberbayern
Municipality:	Traunstein

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Gene conservation in *Populus nigra*

Local name :	Dornau
Latitude :	48°02'54"N
Longitude :	12°47'45"E
Restriction in making the geographical coordinates publically available:	0
Datum:	
Polygon coordinates (if available):	
Minimum elevation (m):	375
Maximum elevation (m):	385
Surface area of the unit (ha):	31.3
Ownership of the unit :	Public
Type and function of the unit :	Gene reserve forest; Biodiversity conservation (habitats AND/or species); Seed stand
Monthly temperature (°C):	
Total annual mean precipitation (mm):	
Heat sum and/or length of the growing season (in days):	
Accumulated moisture deficit:	
Year of collection of the field data entered:	2006
Year of the most recent visit:	2013
Remarks on specific soil characteristics:	
Remarks on other specific characteristics of the unit:	seed stand
All tree species growing in the unit:	*Alnus incana; Salix alba; Populus nigra*
Target species:	*Populus nigra*

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Gene conservation in *Populus nigra*

EUFORGEN data base

- high no. of entries, fair representation of *P. nigra*
- not user friendly, entries frequently incomplete
- situation presently unsatisfactory

EUFGIS data base

- user friendly, entries mostly complete
- low no. of entries, poor representation of *P. nigra* so far
- situation presently still unsatisfactory

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Shortcomings and Consequences

EUFORGEN data base

- user friendly access required (total revision)
- also updating and completion of entries

EUFGIS data base

- increase the no. of entries
- Include eastern occurrences (both databases)

➢**merge the EUFORGEN into the EUFGIS database**

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Acknowledgements

Holder of germplasm for maintaining the units

Collectors and contributers of data

Bioversity (IPGRI) for establishing and maintaining the EUFGIS data base

IPS-VI organisers for allowing this presentation

Thank you for your attention!

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