

**COLLECTION OF PROVENANCE PLOT DATA FOR
UNIFIED SPECIES RESPONSE FUNCTION – D.T1.3.2**

**Conservation and sustainable utilization of forest tree
diversity in Climate change (Project n° CE614)**

The objective of the project is to improve integrated environmental management capacities
for the protection and sustainable use of natural heritage and resources

31st July 2018

Compiled by:
Rafael Buchacher (BFW)

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THE COMMON SUSTREE DATABASE

1. COLLECTION OF PROVENANCE TRIAL DATA

In the course of the SUSTREE project, the project partners were asked to contribute data of provenance trials to a common database for the construction of Universal Response Functions (URF) models. Because of the concentration of the project on for forestry important European tree species, data for seven different species (*Abies alba*, *Fagus sylvatica*, *Pinus sylvestris*, *Picea abies*, *Larix deciduas*, *Quercus robur* and *Quercus petraea*) were collected. The contained results of the trial sites are only provenance mean values of DBH (diameter at breast height), height and survival. Single tree data were not collected. In addition, information about the location (coordinates and altitude) of trial sites and provenance origin were collected. The database also contains information about the age and establishment (plant distance, year of establishment) of trial sites and about soil types if available.

Most of the collected data were from project partners, but other European research organisations also made an important contribution to this database (table 1). Not only data, which were already published, could be collected. A large part of it is unpublished.

SUSTREE PP1, Austrian Research Centre for Forests (BFW) also made an extensive literature research to find articles about provenance trials and to contribute additional data to the common database.

#	Contributor organisation	Country	SUSTREE project partner
1	Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW)	AT	<input type="checkbox"/>
3	National Forest Centre (NLC)	SK	<input type="checkbox"/>
4	National Agricultural Research and Innovation Centre (NAIK ERTI)	HU	<input type="checkbox"/>
6	Northwest German Forest Research Institute (NW-FVA)	DE	
7	Bavarian Office for Forest Seeding and Planting (ASP)	DE	<input type="checkbox"/>
8	Forest Research Institute, Sofia	BG	
9	University of Forestry, Sofia	BG	
10	Forest Research Institute (IBL)	PL	<input type="checkbox"/>
11	Slovenian Forestry Institute (SFI)	SI	

13	Croatian Forest Research Institute	HR	
14	Norwegian Institute of Bioeconomy Research (NIBIO)	NO	
15	Centre International de Recherche sur l'Environnement,	FR	
16	National Institute for Research and Development in Forestry "Marin Dracea"	RO	
17	University of Sarajevo	BA	
18	University of Novi Sad, Institute of Lowland Forestry and Environment (ILFE)	RS	
19	INRA – Université de Bordeaux,	FR	

TABLE 1: RESEARCH ORGANISATIONS WHICH CONTRIBUTED DATA TO THE COMMON SUSTREE DATABASE.

The compiled data was checked for possible errors. Coordinates of provenances and trials were verified in a GIS framework. If possible the error was rectified, otherwise it was removed.

2. OVERVIEW OF THE COLLECTED DATA

Data from about 600 trial sites were collected in the course of the SUSTREE project (table 2). *Picea abies* and *Pinus sylvestris* are the tree species with the highest number of trial sites (236 and 100), but for *Fagus sylvatica* the number of records is higher than for Scotch pine.

Tree species	Number of trial sites	Number of records
<i>Abies alba</i>	50	2392
<i>Fagus sylvatica</i>	74	5780
<i>Larix decidua</i>	50	982
<i>Picea abies</i>	236	20321
<i>Pinus sylvestris</i>	100	3379
<i>Quercus robur</i>	48	1287
<i>Quercus petraea</i>	36	1148
<i>Quercus sp.</i>	1	36
Sum	595	35296

TABLE 2: NUMBER OF TRIAL SITES AND RECORDS SEPERATED BY TREE SPECIES.

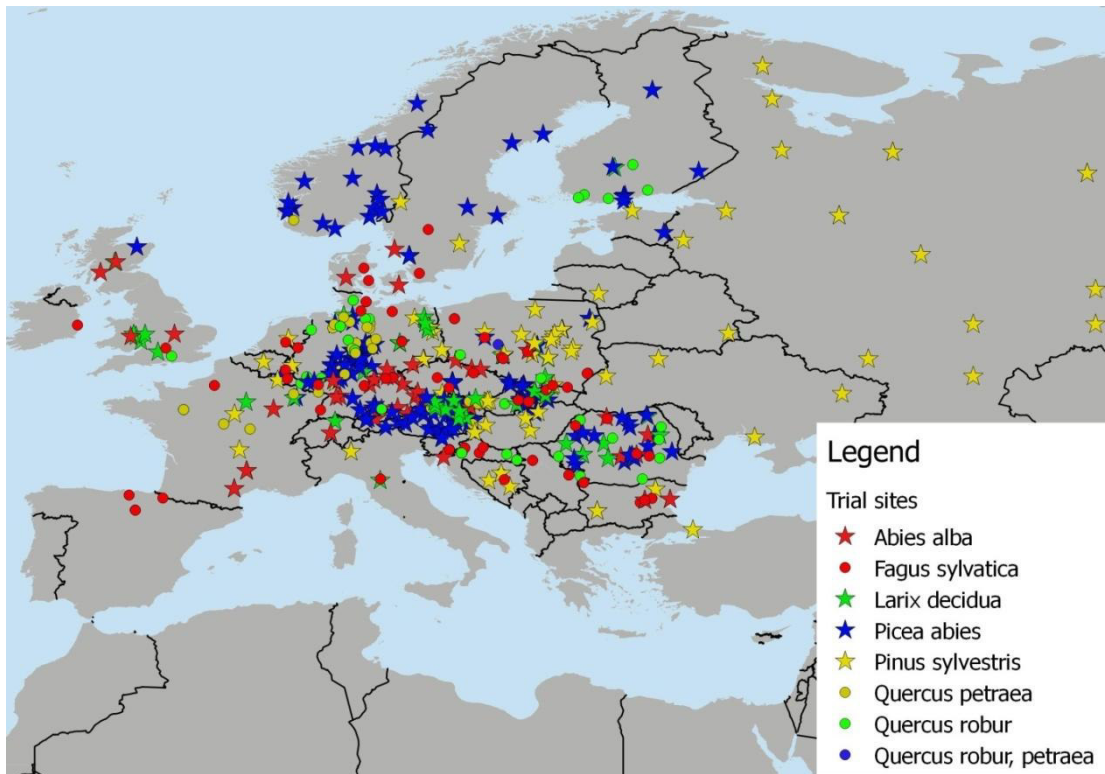


FIGURE 1: LOCATION OF TRIAL SITES. THE SITES IN ASIA AND NORTH AMERICA ARE NOT ILLUSTRATED ON THIS MAP.

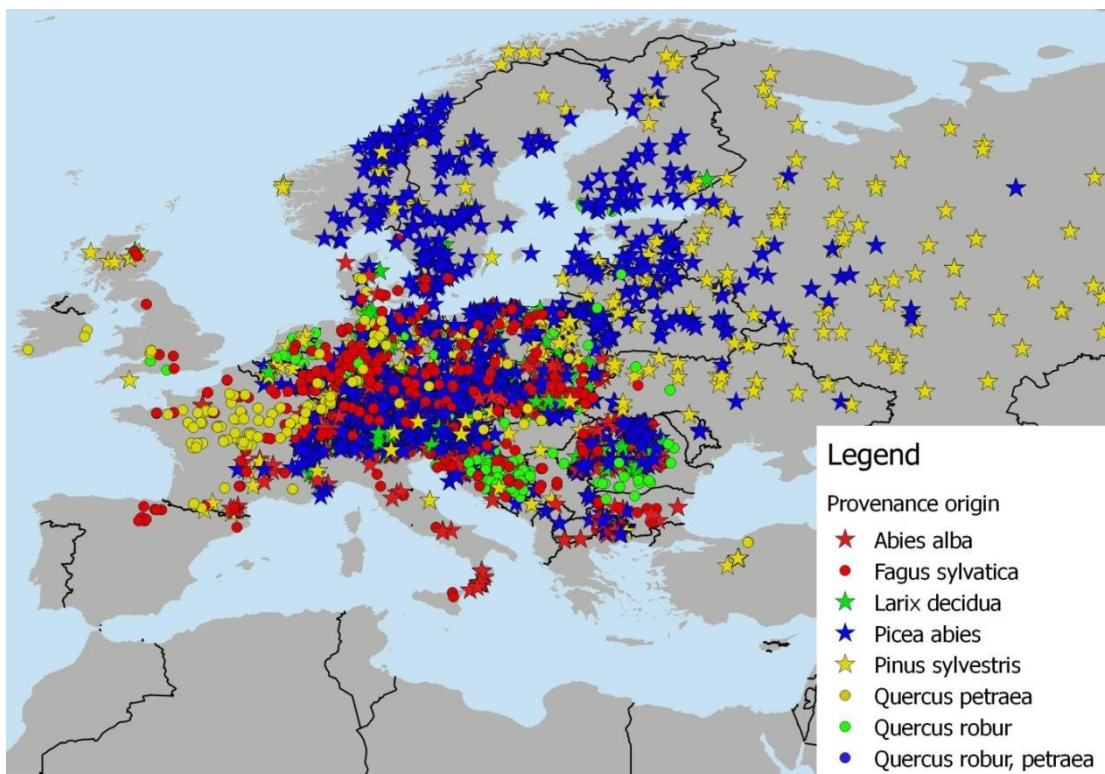


FIGURE 2: LOCATION OF PROVENANCE ORIGINS.

The most of the trial sites are located in Europe (figure 1), but there is also a series of Scots pine trials in Asia and spruce and pine sites in North America. In the US a larch trial site is also situated.

3. CONTENT OF THE FILES

The whole database consists of one EXCEL-file and eight CSV-files (table 3). The EXCEL-file, named as “Info_Contributor_Source.xlsx”, contains information about the contributor organisation and contact persons. In this file is also a table with the sources of data. The results of trial sites and information about trials and provenances are contained in the coma separated files (.csv). The data was separated by tree species, so that, one CSV-file is for one species. The CSV-files are named with the first letter of the genus name plus the species name, for example “Fsylvatica.csv” for the beech dataset. The structure of the datasets is shown in table 4.

Name of the file	Content
Info_Contributor_Source.xlsx	Information about the data contributors and the sources of data
Aalba.csv	Results, trial and provenance information for silver fir
Fsylvatica.csv	Results, trial and provenance information for common beech
Ldecidua.csv	Results, trial and provenance information for European larch
Pabies.csv	Results, trial and provenance information for Norway spruce
Psylvestris.csv	Results, trial and provenance information for Scots pine
Qrobur.csv	Results, trial and provenance information for pedunculate oak
Q.petraea.csv	Results, trial and provenance information for sessile oak
Qsp.csv	Results, trial and provenance information for oak data, where it was not differentiate between Q.robur and Q.petraea

TABLE 3: FILE NAMES OF THE SUSTREE DATABASE.

	Name of the column	Description
IDs	CS_ID	Combination of contributor and source ID
	CST_ID	Combination of contributor, source and trial ID
	CSP_ID	Combination of contributor, source and Provenance ID
Species	Species	Name of the tree species
Trial information	Site_country	Country where trial site is located
	Site_name	Name of the Trial site
	Site_district	Forest district
	Site_lat	latitudinal coordinates as a decimal number
	Site_lon	longitudinal coordinates as a decimal number
	Site_alt	Altitude in m
	Site_alt_min	Minimum altitude
	Site_alt_max	Maximum altitude
	Area	Area of test site, in hectares
	Design	Design of trial , eg. Block test, single planting
	Replications	Number of replications / blocks
	Year_plant	Year when seedlings were planted
	Age_plant	Age of seedlings when planted
	Trees_ha	Number of trees per hectare
	Dist_plant	distance between planted trees in meter
	Nr_prov	Number of provenances tested on this site
	Site_survival	Survival rate of plants on this site (%)
	Prev_land_use	Information about previous land use of site
	Soil_type	Soil type of site
Trials_Comments	Comments	
Provenance information	Prov_Country	Country from where the provenance is
	Prov_label	any labels which facilitate identification of the provenance
	Prov_name	Name of provenance
	Prov_district	Forest district
	Prov_lat	latitudinal coordinates as a decimal number
	Prov_lon	longitudinal coordinates as a decimal number
	Prov_alt	Altitude in m
	Year_harv	Year when seeds were harvested

	Age_mother	Estimated age of mother trees
	Weight_1000	Weight (g) of 1000 seeds
	Provenances_Comments	Comments
Results	Age	Age of trees when the following parameters were measured
	Year_measurement	Year when measurement was done
	Height_mean	mean height of provenance at respective test site (cm)
	DBH	Diameter at breast height (cm)
	Vol_prod	Volume production (m ³ / ha)
	Survival	Survival rate of trees
	Records_Comments	Comments

TABLE 4: DESCRIPTION OF THE CONTENT OF THE DATA FILES.

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**Conservation and sustainable utilization of forest tree
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27th June 2018

Contributors:

SUSTREE project partners,
associated partners and
external experts from EU

Compiled by:

Rafael Buchacher (BFW)

Provenance location and trial sites merged for all seven species of Europe

