

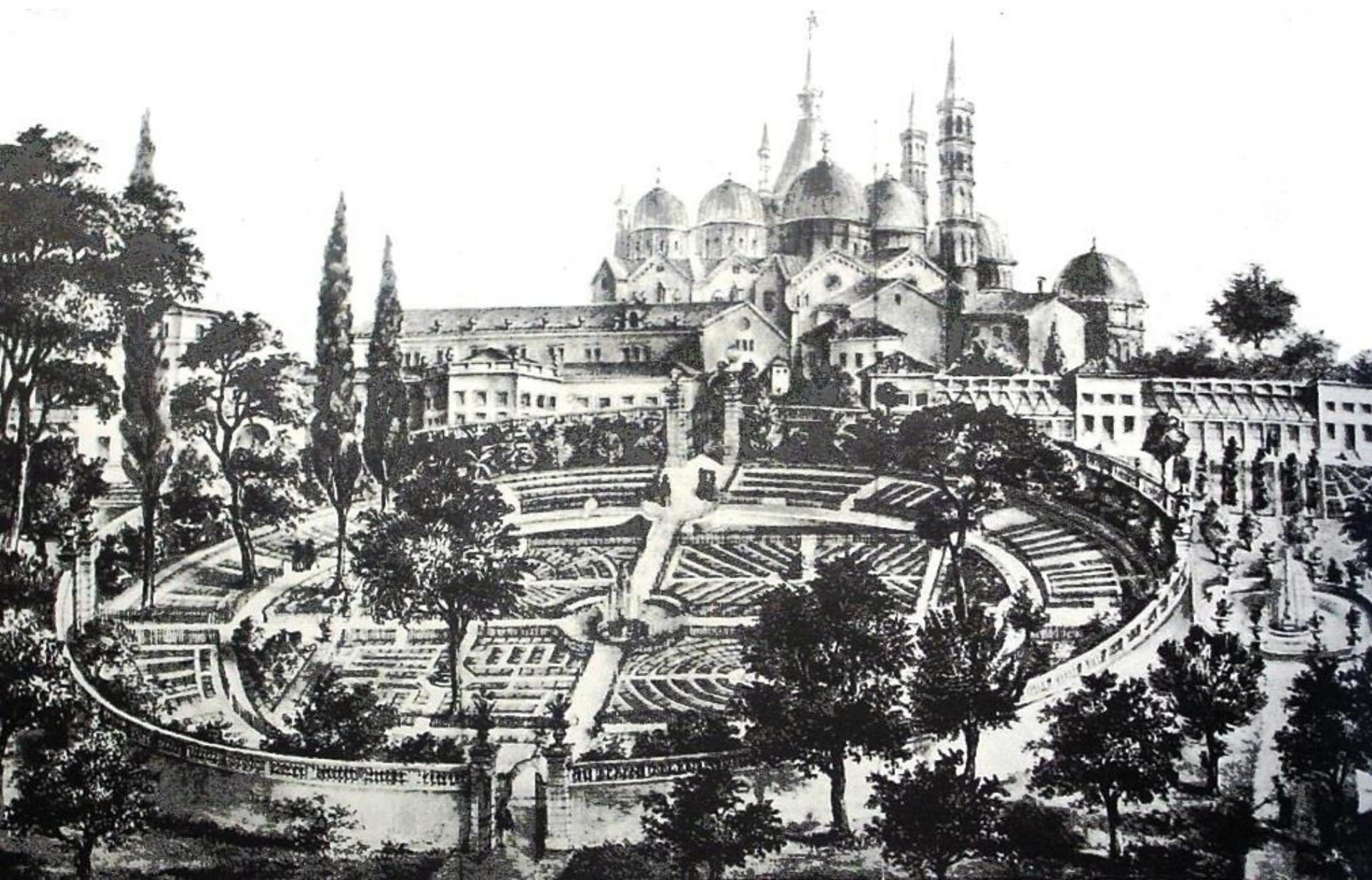
Introduced tree species in Europe

Their history in a nutshell



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16th-century print of the Botanical Garden of Padua, the oldest academic botanic garden (1545) still at its original location.



Introduction of tree species started early in pre-historic times

The active introduction of new tree species

- has always been driven by human needs
- dates, at least, back to the Mesolithic (about 10.000 to 5.000 BC).
- Nutshells of Hazel were found in England dating 10.000 B.C.
- 500 – 1000 years before the first pollen.

Tree species introductions have strongly shaped the composition of European forests.

Reliable food & feed

The motivations for the earliest introductions

- Were mostly driven by the establishment of reliable food and animal feed sources
- Hazel, oak, sweet chestnut and European beech

Postglacial re-colonisation was still ongoing when Phoenician, Greek and mainly Roman trade networks broadened the distribution range of tree species, such as:

- the sycamore maple (*Acer pseudoplatanus* L.),
- sweet chestnut (*Castanea sativa* Mill.)
- common walnut (*Juglans regia* L.).

The inter-continental transfer of valuable tree species was already ongoing during the expansion of the Roman Empire.

- The quince (*Cydonia oblonga* Mill.), for example, was brought from Central Asia, via South-western Asia to South-eastern Europe.
- The common medlar (*Mespilus germanica* L.) was transplanted by the Assyrians from the Caucasus to Turkey.

human curiosity, mainly that of botanists

The introductions of new tree species from the New World in 16th and 17th century were driven by:

- human curiosity
- ornamental reasons
- aesthetic reasons.

The oldest known introductions of North American tree species, 16th /17th century

- 1536: the white cedar (*Thuja occidentalis* L.) in France.
- 1601: black locust (*Robinia pseudoacacia* L.), planted by the botanist Jean Robin in Paris, France.

*The first European
black locust,
planted by Jean Robin
in 1601.
Still alive in Paris.*





Europäen zur Bereicherung. *Halle delbet sculp. s.*

Trading of red oak (*Quercus rubra*) and chestnut oak (*Quercus prinus*) acorns in North America at the end the 18th century (Von Burgsdorf, 1787).

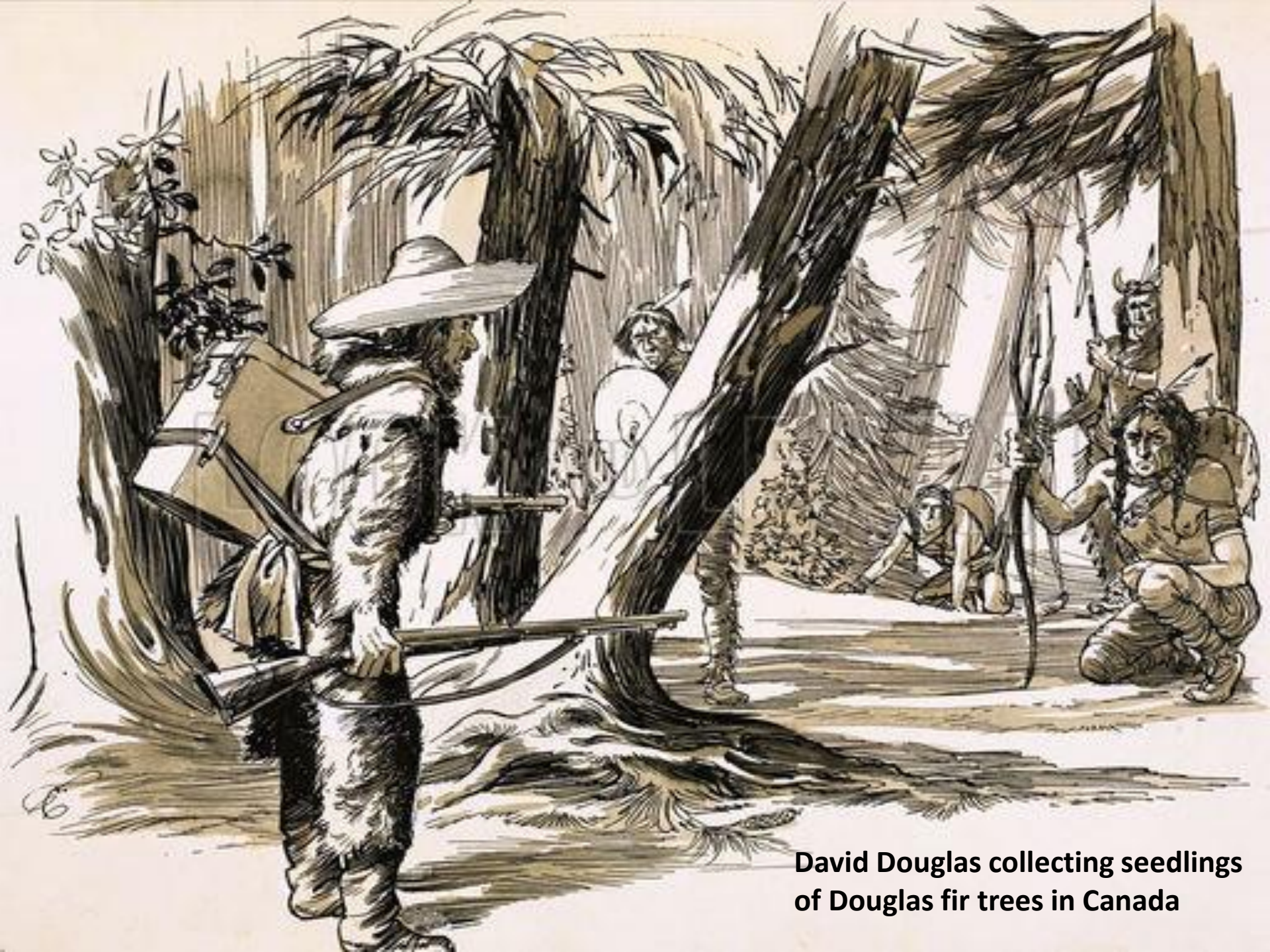
The oldest known introductions of North American tree species, 16th /17th century

- 1536: the white cedar (*Thuja occidentalis* L.) in France.
- 1601: black locust (*Robinia pseudoacacia* L.), planted by the botanist Jean Robin in Paris, France.
- 1623: black cherry (*Prunus serotina* Erhr.), in Paris, France. Jean Robin describes the species under the name *Cerasus americana latifolia* in the *Enchiridion isagogicum* from 1623.
- 1683: horse chestnut (*Aesculus hippocastanum* L.), originating from south-eastern Europe, was already present in parks in Finland.
- 1691: red oak (*Quercus rubra* L.) was introduced in Switzerland mainly planted as a park tree.

This interest in the world of plants culminated in the publication of the *Species Plantarum* in 1753 by Linnaeus.

Introduction of tree species from North America, 19th century

- 1827: Douglas fir (*Pseudotsuga menziesii*) introduced to Great Britain.



David Douglas collecting seedlings of Douglas fir trees in Canada

Introduction of tree species from North America, 19th century

- 1827: Douglas fir (*Pseudotsuga menziesii*) introduced to Great Britain.
- 1830: noble fir (*Abies procera*)
- 1832: Sitka spruce (*Picea sitchensis*)
- 1833: grand fir (*Abies grandis*)
- 1854: Lawson cypress (*Chamaecyparis lawsoniana*)
- 1851 western hemlock (*Tsuga heterophylla*)



Mimosa or silver wattle (*Acacia dealbata*)

- originating from Australia
- introduced to Europe around 1800
- widely planted in the 19th century on the French Mediterranean coast.
- called 'King of Winter' for its yellow winter flowering.

Introduced tree species in forest restoration 19th & 20th C.

- Due to the growing wood demands that rose during the industrialisation of Europe, a significant part of the European forest cover was restored in 19th and 20th century.
- This restoration of overexploited forests catalysed the use of the introduced tree species. Since 19th century, introduced tree species became part of the modern plantation forestry, which was, from a social-ecological viewpoint, closely linked to the development of the capitalistic economy of growth.

Beschreibung
einiger 2^{tes} Suppl.
Nordamericanischen

Holz- und Buscharten,

mit Anwendung
auf teutsche Forsten;

zum Gebrauch
für

Holzgerechte Jäger und Anpflanzer,
fremder Holzarten

von

Friedrich Adam Julius von Wangenheim
Capitain beym Hochfürstl. Hessen-Casselschen Feldjäger-
Corps in Nordamerica,

aus den

in dortigen Provinzen seit den Jahren 1777. bis
1780. gemachten Bemerkungen.

Göttingen,

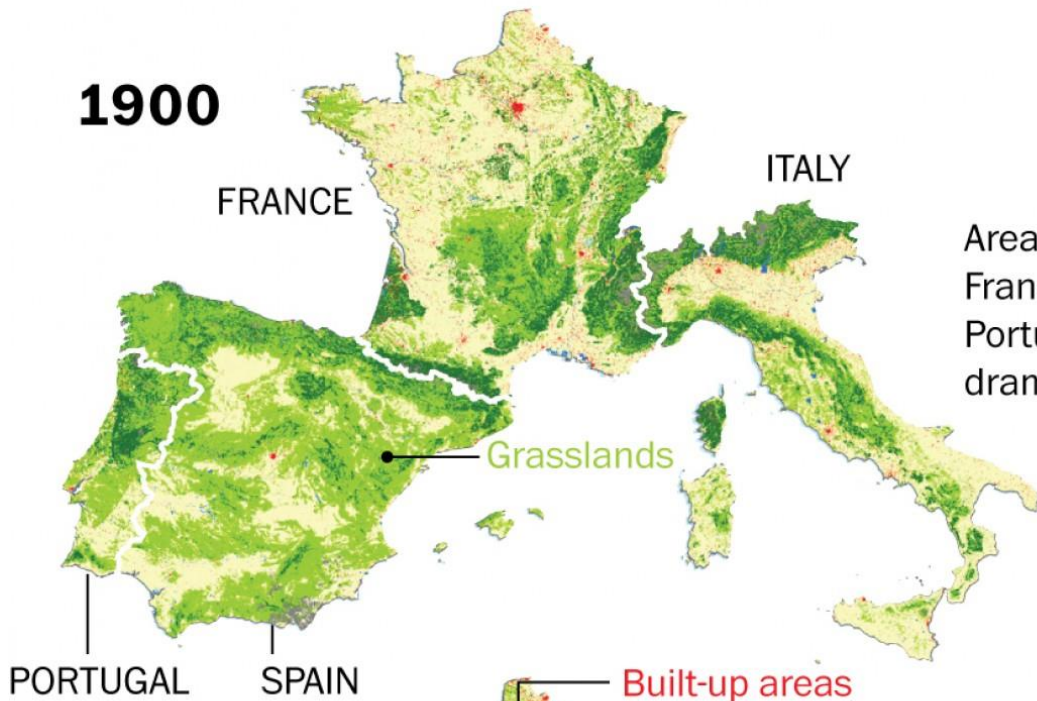
bey Johann Christian. Dieterich.

1781.

Introduced tree species in reforestation 20th C.

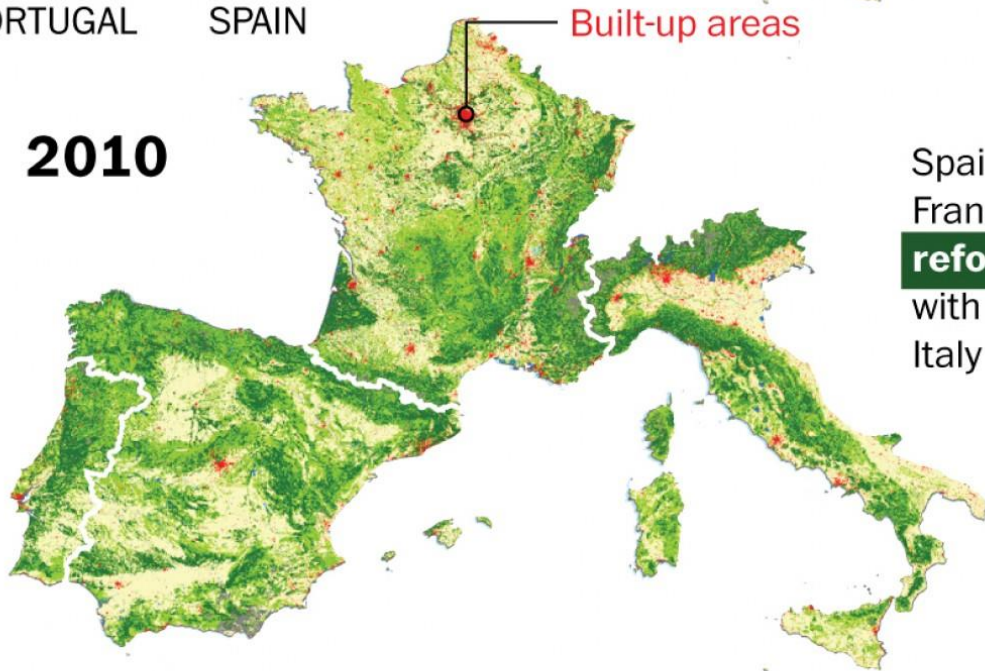
- Mainly in the 20th century
- Industrialisation of the agriculture (fertilisers)
- Intensification of agriculture on the best lands.
- Reforestation of 'wastelands', formerly used for cattle and sheep herding.

1900



Areas used for **farming** in France, Italy, Spain and Portugal have decreased dramatically

2010



Spain and southern France saw widespread **reforestation**, along with Apennine regions of Italy

1900



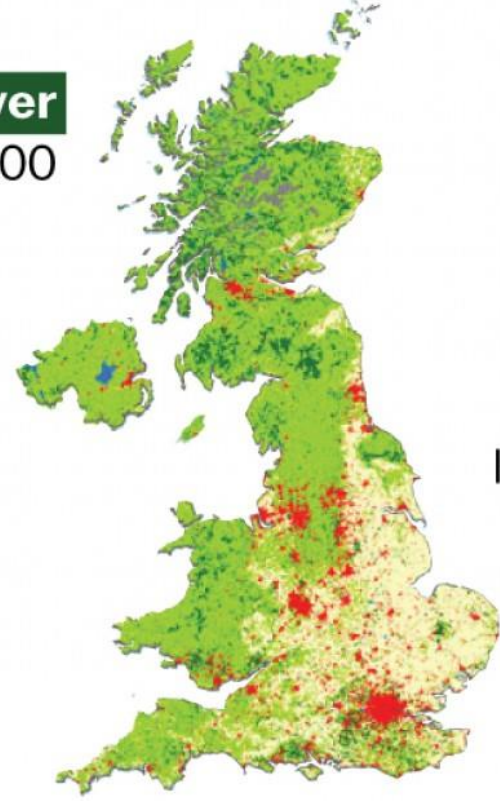
UNITED KINGDOM

In the Netherlands and the United Kingdom, **forest cover** increased from 2 - 3 % in 1900 to 10 - 12% in 2010

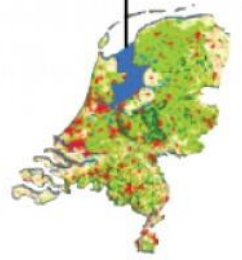


NETHERLANDS

2010



The **Zuiderzee** shrunk due to land reclamation



Hilda data sets: Richard Fuchs, University of Wageningen



1900



2016

The non-European tree species that are currently present in European forests on a substantial scale are those that were used for reforestation in Europe in 20th century.

- Black locust
- Acacia
- Eucalyptus
- Douglas fir
- Japanese larch
- Red oak
- Black cherry

Conclusions

- The current need for adaptation of forest ecosystems to a relatively rapidly changing environment urges finding a proper role and place of introduced tree species in forest ecosystems.
- The most important is the analysis of the role of these tree species in today's adaptive and integrative close-to-nature forest management.
- The already naturalised introduced tree species could best be integrated in forest management

Future of introduced tree species?



Common medlar in the Netherlands

- Originating from the Caucasus
- Introduced in the middle ages.
- Now on the red list of protected species,



Thanks for your attention



- *125 year old Black cherry near Aachen (Germany), planted by Adam Schwappach.*