

# THE MODERN SILVICULTURE OF *JUGLANS REGIA* (L.): A LITERATURE REVIEW

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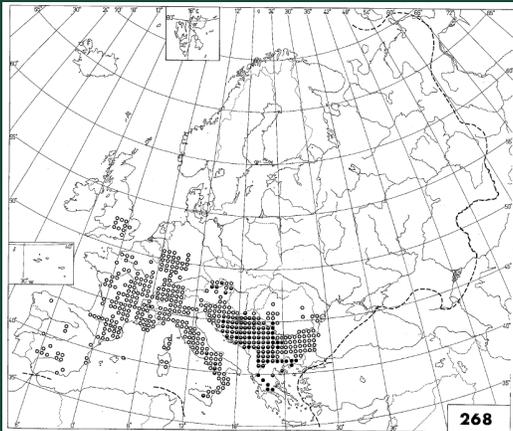
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## Introduction

Common walnut (*Juglans regia* L.) is cultivated across much of Europe.



Distribution map of *Juglans regia* (L.) (after J. Jalas and J. Suominen, 1972-2004)

There are many qualities that favour it as a valuable broadleaved tree for the future:

- rapid growth;
- high value of its timber;
- plasticity in respect to projected climate change;
- potential to combine timber and nut production.

## Site requirements

### TEMPERATURE

*Juglans regia* requires warmth during the growing season; requiring at least 6 months with an average temperature >10 °C (Becquey, 1997). *Juglans regia* is sensitive to winter and late spring frosts.

### WATER

For optimum growth, *Juglans regia* requires 700-800 mm of rainfall, which ideally is well-distributed throughout the year

### SOIL

The best soils for *J. regia* cultivation are loams (clay >25%, silt 30-50% and sand 30-50%)

## Growth pattern

In plantation conditions, for single *Juglans regia* trees no more than 70 years old, diameter increments of approximately 1 cm per year have been observed.

## Crown architecture

Crown shape in *Juglans regia* is strongly influenced by the density of stems and species mixture of a plantation. In pure walnut plantations with low density and without artificial pruning, *J. regia* tends to produce forks and large branches. Crown shape and branching habit in dense mixed plantations contrast greatly to those in pure plantations



Tree with high quality stem form could be obtain in pure walnut plantations with artificial pruning.

30 years pure walnut plantation in Empoli (Italy) with artificial pruning

## Regeneration

Both gamic and agamic regeneration are possible. During first 4-5 years vegetative regeneration can be used to replace young damaged trees.

## Silviculture

### PRUNING

Three different artificial systems are used: flagpole pruning, progressive pruning and recently reiterative pruning (Becquey, 1997; Bidini *et al.*, 2004).

### THINNING

Thinning must be undertaken before lateral competition influences diameter growth.



8 years mixed walnut plantation Mantova Italy

## Cultivation systems

### MULTIPURPOSE PLANTATIONS

Combining nut and timber production (Minotta, 1990; Minotta, 1992)

### SPECIALIZED PLANTATIONS FOR TIMBER

- *pure plantations*
- *mixed plantation* with companion trees and shrubs (especially N-fixing trees)
- *polycyclical plantations* combining medium-long term production (walnut) with short term production (poplar and S.R.F.) (Buresti Lattes *et al.* 2006, 2008; Vidal and Becquey 2008)



Growing Valuable Broadleaved  
Tree Species