

## Quercus palustris in Europe: distribution, habitat, usage and threats

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*Quercus palustris* Muenchh. is commonly known as pin oak, Spanish oak or swamp oak. The epithet *palustris* means “swampy”, as pin oak is primarily found on wet sites. It is native to the eastern United States, but has also been introduced into Europe in the last centuries.

Pin oak is a fast-growing deciduous tree reaching 25 (40) m tall, usually with a straight and undivided trunk<sup>1, 2</sup>. Unlike many oaks, it develops a shallow, fibrous root system<sup>3</sup>. The bark is greyish-brown with fissures on surface higher up the trunk<sup>2</sup>. The trunk usually has many small drooping branches that persist for a long time after dying and form small “pin” knots in the wood<sup>4</sup>. The twigs are reddish-brown and smooth<sup>1</sup> and the buds are small (3 mm), dull brown and almost hairless<sup>5</sup>. The leaves are alternate, ranging from 8 to 15 cm long, with five or seven lobes, and deep **sinuses** between the lobes. They are bright green above and shiny pale green below, with characteristic brown tufts of hair in the vein-axils<sup>2</sup>. In the autumn they turn a rich scarlet-brown<sup>5</sup> and often stay on the tree into the winter<sup>3</sup>. Flowering occurs in April or May. The dark-brown acorns are about 1 cm long with a very shallow cup on a short stalk<sup>2, 5</sup>. It is not particularly long-lived and reaches physiological maturity at 80 to 100 years<sup>4</sup>.

### Distribution

The natural distribution of pin oak is the north-central and eastern United States<sup>4</sup>. It was introduced in Europe at the end of the seventeenth century, primarily as an ornamental, but it has some potential as a forestry species<sup>5</sup>.

### Habitat and Ecology

Pin oak occurs primarily along major rivers, in wet soils along swamps and streams<sup>4</sup>. It is tolerant of moist soil conditions and can grow on poorly drained and seasonally (winter) flooded sites<sup>6</sup>. It prefers moist, rich, acidic, well-drained soils<sup>7</sup>. It is intolerant of



Dark brown maturing acorn with shallow cup on short stalk. (Photographer Emily Mason; Copyright Bruce Kirchoff, www.flickr.com; CC-BY)

shade<sup>7</sup> and it is unable to perform properly in soils with high pH, when it develops significant iron chlorosis problems<sup>4, 8</sup>. It grows well in full sun<sup>3</sup> but it prefers a humid climate<sup>4</sup> and is sensitive to summer drought<sup>6</sup>.



Deep-lobed leaves turning to scarlet in autumn. (Copyright Tracy Houston Durrant; CC-BY)

### Importance and Usage

The wood of pin oak has an inferior quality in comparison with other red oak species especially due to its many small knots<sup>4</sup>. Its wood is hard and heavy, and is generally used for fuel wood, wood pulp, and railway sleepers<sup>4</sup>. Thanks to its crown architecture, fast growing rate, tolerance for urban stresses<sup>9</sup> and its autumn foliar display, it is frequently used in urban landscapes and streets<sup>4</sup>. The acorns provide food for migrating mallards and wood ducks<sup>9</sup>, and are an important food source for a number of other animals including deer, squirrels, turkeys, woodpeckers, and blue jays<sup>4</sup>.

### Threats and Diseases

Pin oak has thin bark and is particularly susceptible to fire<sup>9</sup> and to decay associated with fire damage<sup>7</sup>. It is susceptible to most of the diseases of oak including the pathogen *Phytophthora ramorum*<sup>9, 10</sup> as well as oak wilt (*Ceratocystis fagacearum*)<sup>8</sup> and several insect species including the gypsy moth (*Lymantria dispar*)<sup>4</sup>.



Greyish-brown bark of the pin oak. (Copyright Bri Weldon, www.flickr.com; CC-BY)



Pin oak in Marburg Botanic Garden (Hessen, Germany). (Copyright Willow, commons.wikimedia.org; CC-BY)

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Please, cite as:

Enescu, C. M., Houston Durrant, T., 2016. *Quercus palustris* in Europe: distribution, habitat, usage and threats. In: San-Miguel-Ayanz, J., de Rigo, D., Caudullo, G., Houston Durrant, T., Mauri, A. (Eds.), *European Atlas of Forest Tree Species*. Publ. Off. EU, Luxembourg, pp. e01ec81+

