

# Rooting of 150-year-old oak trees in a thick soil

Researchers from the Laboratory of Pedology of the University of Franche-Comté have studied the organization of the root system of pedunculate oak (*Quercus robur*) developed under non-restrictive edaphic conditions (colluvial leached brown soil). [\[1\]](#)

Root density, inclination, lateral and deep extension of roots were measured on 150-year-old pedunculate oaks established in colluvial leached brown soil. Soil materials, silty-clay and clay-silt... are accumulated 4 m thick above a karstified limestone rock. The current soil, as well as the underlying soil horizons, allow root development without physical or chemical constraints, down to the rock. Pedunculate oaks have a root system that can be divided into two parts: the surface system, which extends up to 60 cm deep, and the deep system, located below 60 cm.

At the level of the surface system and within a radius of 3 m around the tree, rooting is intensive and composed of roots of all diameters (less than 1 mm to more than 10 cm), with maximum root density. The roots are inclined at an angle of 80-85° to the vertical. Extensive rooting can extend up to a distance of 20 m from the tree. The deep root system, which develops within a radius of 2-2.5 m, is subdivided into 2 parts: from 60 to 120 cm (intensive deep system) and below 120 cm, up to more than 4 m (extensive deep system). It is composed of subvertical (tap) roots. An estimate of the volumes of soil prospected intensively and extensively gives 17 and 800 m<sup>3</sup> respectively.

- [Video showing the roots of a 15-year-old oak tree in Kent](#)

---

## Notes et références

**Cover image.** Exposed roots of an ancient oak tree (*Quercus robur*) in Fox Hills Forest in Northrepps Parish, Norfolk, UK. [Source: Kolfor (Wikimedia), CC BY-SA 4.0, via Wikimedia Commons]

[\[1\]](#) Lucot, E. & Bruckert, S. (1992). Organisation du système racinaire du chêne pédonculé (*Quercus robur*) développé en conditions édaphiques non contraignantes (sol brun lessivé colluvial). *Annales des sciences forestières*, INRA/EDP Sciences, 49 (5), pp.465-479. hal-00882815 - <https://doi.org/10.1051/forest:19920503>

---

L'Encyclopédie de l'environnement est publiée par l'Université Grenoble Alpes.

Les articles de l'Encyclopédie de l'environnement sont mis à disposition selon les termes de la licence Creative Commons Attribution - Pas d'Utilisation Commerciale - Pas de Modification 4.0 International.

---