

Natural tree regeneration in oak woodlands

Forest management strategies to promote natural regeneration of evergreen oaks in Mediterranean woodlands

The lack of successful long-term natural tree regeneration is recognised as a major problem for Mediterranean cork and holm oak woodlands. There is a pressing need to improve woodland management to properly regenerate oaks.

The Portuguese Operational Group OakRegeneration proposes agricultural set aside schemes to promote oak natural regeneration hot spots and forest management practices to speed up the lengthy natural regeneration process.



Mediterranean evergreen (cork and holm) oak woodlands

Woodlands with evergreen oaks - cork oak (*Quercus suber* L.) and holm oak (*Quercus rotundifolia* Lam.) - are dominant features in the agrarian landscapes of Southern Portugal, where they occupy about 1.2 million ha. These woodlands, called *Montados*, are open woodlands which have a tree layer and a herbaceous understorey (herbs and grasses growing underneath the trees). The trees are managed for the production of firewood, charcoal, acorns and cork. Annual crops, pastures or fallows are grown in the understorey and it is also used for rearing livestock.

Trees in these oak woodlands are considered as "ecosystem engineers" (Costa et al., 2014), they control ecological processes and functions and enhance structural complexity, habitats and biodiversity. However, trees are currently facing many risks due to environmental and social changes and their failure to regenerate naturally is the major threat to the restoration and conservation of *Montados*.

Natural regeneration is a sustainable solution for oak woodland conservation and must not be neglected. Natural cork and holm oak regeneration areas still occur spontaneously in oak woodlands and when carefully managed, these areas can prosper and even be extended. Enabling cork and holm oak woodlands to regenerate naturally however, requires specific, active and long-term management.

Long-term management and set-aside schemes

The success of a complex and long-term process of natural regeneration depends on multiple factors acting at different stages of the trees' lives, these include:

- competition between young trees with understorey vegetation
- browsing pressure
- woodland density and/or canopy cover
- combination of abiotic conditions

The Operational Group OakRegeneration assumes that agricultural set aside schemes when applied in restricted and selected oak woodland areas will contribute to the onset of the natural oak regeneration process through a secondary forest ecological succession. The project will analyse the regeneration

process success on two main pilot areas with distinct set aside areas in oak woodlands, for 5 to 20 years:

- a cork oak woodland in the proximity of the Atlantic, under mesic conditions;
- a holm oak woodland in a more in-land situation, under xeric conditions.

Also, the project is implementing agricultural set aside schemes in selected oak woodland areas in order to enable natural oak regeneration. The forest owners involved in the project have restricted agricultural set aside areas in their oak woodlands and are applying specific forest management practices and testing them under local conditions.

The management practices include:

- techniques of understorey clearing, to tackle the competition between young trees with understorey vegetation;
- the reduction/substitution of livestock to tackle the browsing pressure;
- the selection of trees for pruning and thinning to optimise woodland conditions;
- the use of chemical and biological fertilisers to improve soil conditions under xeric/mesic conditions.

The necessary time period of agricultural set aside for a successful natural regeneration process will be assessed, based on a natural regeneration forest inventory.



Project results

The OakRegeneration Group will disseminate its results to foresters and policy makers at regional and national level. It has set up a website (www.oakregeneration.pt) where all of the actions in each agricultural set aside area can be monitored, it also includes a free georeferenced spatial platform and scientific and technical publications related to natural regeneration.

OakRegeneration has participated in two national and two international workshops and has published two documents. It will organise dedicated workshops this year to bring together agri-associations, forest owners and forest managers.

The final goal of OakRegeneration Operational Group is to provide basic scientific and technical knowledge on the process of oak natural regeneration for the conservation of Montados, with improved adaptive capacity to global changes:

- To ensure that spontaneous natural regeneration hot spots in the oak woodlands can be used and properly managed for the conservation of Montados;
- To ensure that potential natural regeneration areas in the oak woodlands can be created and properly managed for the enlargement of the Montados area.

Project partners

INIAV - Instituto Nacional de Investigação Agrária e Veterinária, I.P.

Agri association

ANSUB - Associação de Produtores Florestais do Vale do Sado

AFLOSOR - Associação de Produtores Agro-Florestais da Região de Ponte de Sor

ACHAR - Associação de Agricultores de Charneca

ADPM - Associação para o Estudo e Defesa do Património Natural e Cultural do Concelho de Mértola

Agri enterprise

CL - Companhia das Lezírias, S.A
EDIA - Empresa de Desenvolvimento e Infraestruturas do Alqueva, S.A.
Herdade do Paúl - Sociedade de Gestão Rural, Unipessoal Lda
Anta de Cima - Sociedade Agrícola Unipessoal Lda
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Links

<https://www.oakregeneration.pt/en/framework/>

<https://inovacao.rederural.gov.pt/2/72-oak-egeneration>

<https://ec.europa.eu/eip/agriculture/en/find-connect/projects/oak%C2%AEegeneration>

Page 81 : <https://ec.europa.eu/eip/agriculture/sites/agri->

[eip/files/field_event_attachments/ais_lisbon_2017_innovation_projects_catalogue_21112017.pdf](https://ec.europa.eu/eip/agriculture/sites/agri-)

Photos: OakRegeneration

This Operational Group presented their project at the Agri-Innovation Summit 2017 (AIS 2017) which took place in October 2017 in Oeiras, Portugal. [More information on this event.](#)