Geophysical Research Abstracts
Vol. 12, EGU2010-1238-1, 2010
EGU General Assembly 2010


# Is thinning adequate for adapting old Quercus ilex coppices to climate change?

Jesus Rodriguez-Calcerrada, Ignacio-Manuel Perez-Ramos, Jean-Marc Ourcival, Jean-Marc Limousin, Laurent Misson, Richard Joffre, Serge Rambal, and Nicolas Martin

Centre d'Ecologie Fonctionnelle et Evolutive. CNRS 1919 Route de Mende, 34293 Montpellier Cedex 5, France (jesus.rodriguez-calcerrada@cefe.cnrs.fr)

Future climatic scenarios call for an increasing involvement of management for forest preservation, but little is known on how forestry practices will benefit stands in facing variation of climatic components. We investigated how thinning affected tree responses to six years of continued throughfall reduction in a Mediterranean Quercus ilex stand formerly managed as a coppice. Thinned plots (≈33% basal area removal) and unthinned plots were subsequently subject to either throughfall exclusion (≈28% throughfall reduction) or normal rainfall. Stem-diameter growth, stem survival and seed production were monitored over the following six years; the presence, abundance and growth of new sprouts were measured in the last year. In the absence of thinning, throughfall exclusion accelerated the mortality of small stems, reduced the production of viable acorns and stimulated the emergence of new sprouts. Throughfall exclusion did not have any effect on stem growth. Rather, trees responded to the imposed reduction on throughfall by decreasing the leaf area and thus by minimizing the risk of xylem cavitation. Thinning reduced the mortality of stems, enhanced the diameter growth of residual stems and caused a profuse emission of resprouts. Thinning also increased total seed production but the crop had a large proportion of aborted seeds. Overall, the results point out to a better disposition of thinned Q. ilex coppice stands to cope with future (probably longer and more intense) droughts, at least in the short term. The reduction in standing dead biomass reduces the probability of occurrence of wildfires while the increase in growth and probably carbon reserves may help trees to overcome dry summers where CO2 assimilation is strongly limited. The mere felling of dominated and diseased stems, however, will probably not result in any longer-term advantage derived from seed regeneration without any further silvicultural treatment that promote seedling recruitment.