

Is the net primary productivity of *Quercus ilex* ssp. *ballota* affected by post-fire thinning treatments and recurrent fires?

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Abstract

The holm oak (*Quercus ilex* ssp. *ballota*) is a late-successional hardwood species of the Mediterranean region and an important evergreen specie in eastern Spain, where holm oak woodlands comprise more than 10% of total forest area. Copicce forest stands are usually affected by wildfires but they have developed adaptive traits to overcome the effects of fire (ie. asexual reproduction by resprouting). High post-fire resprout density could lead to forest stagnation, so silvicultural treatments, like thinning, might be carried out as a precautionary measure.

In this study, post-fire treatment effects were studied on *Quercus ilex* ssp. *ballota* stocks and its net primary productivity (NPP). The study area, located in Campillo de Altobuey (SE Spain), was divided into control plots (unaltered density) and plots of three thinning intensities (medium, drastic and total felling). Plots were designed in a 6 year old coppice forest stand. For NPP assessment, every tree was monitored and destructive samplings (above and below ground) were taken. An additional study was possible 8 years after the initial fire when an unexpected fire burnt part of study area, thus allowing for a study of recurrent fire effects.

NPP in the study site was lower than reported global averages (4.1- 4.8 t Ha⁻¹y⁻¹). Results showed that thinning treatments improved total NPP in spite of the fact that these plots (data recorded before thinning) had lower mean annual productivity (MAP) values than control plots. Moreover, the obtained results suggested that medium thinning (final density: 5000 trees Ha⁻¹) was maximizing relative productivity while resprouting values were moderate. In contrast, drastic thinning (final density: 1800 trees Ha⁻¹) and total felling was maximizing resprout production, although there were no significant differences in NPP comparing it to other treatments (control and medium thinning). However, total felling is not an advisable treatment for *Quercus ilex* ssp. *ballota* (at least in the timeframe of the study) but medium thinning treatments were found to be advisable. It was also discovered that recurrent fires induce a decrease in NPP so it can be concluded that resprout vitality is affected by successive fires.

Additional key words: Allometric relationships, biomass, carbon sink, growth, oak, SE Spain

Suggested for poster, , it could be included in third session "Ecology and biodiversity, contingency plan"

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