Competition pattern in young cork oak stands

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ABSTRACT

Cork oak (Quercus suber) is a Mediterranean species from which the tree bark (cork) is extracted and used as raw material. Portugal is responsible for supplying more than 50% of the world cork market. Since this tree species plays a key role in the Mediterranean agroforestry systems, the area of cork oak plantations has been increasing in this country. Any contribution to improve silvicultural operations in this system management will lead to a positive economic value. Thinning is a silvicultural procedure that reduces tree density, and is the way to control stand structure over time. The aim of this study is to understand at which stage of the stand development in young cork oak stands does competition unfold and which type of competition was in place. This will allow determining an optimal schedule for thinning and to change intra-specific competition. For the analysis, data from permanent plots on juvenile stands located across the cork oak Portuguese area were used. This data includes three measurements on tree dendrometric variables by each plot, with a time interval of at least three years. As a result, it was possible to understand that the current spacing used on cork oak plantations may not lead to tree competition before the second cork extraction. The first cork extraction occurs when the tree diameter over bark achieves a legal threshold (tree age around 20 years), but cork quality can only be assessed by the time of the second cork extraction. As a conclusion, it is suggested that the systematic removal of trees, without any knowledge on tree cork quality, should be avoided, thus the thinning operation could be carried out at the second cork extraction. This contribution may change the traditional silvicultural operations planning for the cork oak systems.

Keywords: relative growth rate, asymmetric competition, symmetric competition, cork quality