

Some plant ecophysiology studies and their practical contributions in forestry in Turkey

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Abstract: Plant ecophysiology is the study of physiological responses to the environment. The field developed rapidly as a relatively unexplored interface between ecology and physiology. Ecology provided the questions, and physiology provided the tools to determine the mechanism. The adaptability of plants to extreme weather conditions as a result of global climate change is necessary for sustainable forestry. Recently in Turkey ecophysiology and modeling studies have gained importance in order to understand the reaction of forest trees to environmental conditions. Ecophysiology studies can make significant contributions to plant growth practices, Silvicultural treatments, plant growth estimates in trees. Physiological reactions and acclimation of plants to stress factors (drought, frost, salinity, etc.) can be understood by experiments done laboratory or controlled environments. Due to its specific location, Turkey has forest ecosystems with different edaphic factors and climatic diversity. For this reason in reforestation, different techniques and cultural works are needed. The susceptibilities of different species, genotypes and ecotypes of forest trees to stress factors such as drought and cold hardiness should also be determined. Thereafter, the selected resistant species, genotype or ecotypes can be used in Afforestation. Forest decline or even dieback in response to high temperatures and drought has been occurring in the last few decades. Therefore ecophysiological studies focus on predict and model future tree responses and survival to water deficit. Arid and semi-arid areas covers about 75% of Turkey's total land area. For this reason, majority of ecophysiological studies has focused on drought tolerances of forest trees. However a number of studies have been performed for the cold and salinity tolerances of forest trees. In this study, we evaluated the Ecophysiological studies that have been conducted on the forest tree species distributed in Turkey. The contribution provided through these studies for practice and present scientific knowledges was discussed. Suggestions for their practical utilization in afforestation and silvicultural treatments were also given.

Keywords: Turkey, Ecophysiology, Drought tolerance, Cold hardiness, Climate change