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Drought Reactions of Different Provenances of *Corylus avellana*

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Abstract

Corylus avellana is an important landscaping plant. In Germany the use of trees and shrubs in the open landscape is regulated by law (Federal Nature Conservation Act § 40) due to supposed genetic differences between provenances (conservation of biodiversity) and their adaptation to specific habitats. It is assumed that this adaptation supports performance in the landscape.

Two years old plants from four provenances of *Corylus avellana* coming from climatically different parts of Germany were used in a drought experiment under controlled conditions. The plants were exposed to a slowly and quickly developing drought stress by controlled decreasing irrigation. Well irrigated plants served as control. The experiment was carried out in a completely randomised design with 6 resp. 8 replications per treatment. During the experiment pre-dawn water potential, relative water content and stomatal conductance were measured. Chlorophyll fluorescence was determined at the beginning and at the end of the experiment. The experiment was terminated when severe wilting was visible. This was the case after 13 days for the slowly developing stress and after 9 days for the quickly developing one. With the background of a high standard deviation the following trends developed.

Apart from one provenance, in the beginning of the stress period stomatal conductance calculated as percentage from the control decreased marginally followed by sharp decline. This was also reflected in the results of pre-dawn water potential which differed greatly from the control plants at the end of the stress period. There were no differences between the provenances. Drought reactions probably were interfered with a previous though hardly visible ozone damage, which however appeared with heavy necroses when the plants were subjected to drought. Again with a high standard deviation the provenances differed in the development of visible ozone damage symptoms coinciding with the drought symptoms. At the end of the experiment, provenances with severe symptoms showed lower chlorophyll fluorescence than those with moderate symptoms. The pre-damage by ozone might have also affected the reaction of stomates, since the provenance with an early closure of stomate had fewer symptoms.

Keywords: *Corylus avellana*, drought, provenance

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