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Evaluation of chlorophyll fluorescence as an indicator of dehydration stress in

American chestnut seedlings

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ABSTRACT

American chestnut (*Castanea dentata* (Marsh.) Borkh. [Fagaceae]) was an important species for timber and wildlife in the eastern US, but it was decimated by chestnut blight (*Cryphonectria parasitica* (Murr.) Barr [Valsaceae]). Recent advances in breeding for resistance to chestnut blight have increased interest in the silviculture and management of this species for deployment in afforestation programs. Three-mo-old American chestnut seedlings grown in containers were allocated to 4 treatments (0, 24, 48, or 72 h without irrigation) and subsequently evaluated for chlorophyll fluorescence, measured as maximum quantum yield (F_v/F_m). Maximum quantum yield was constant until seedlings had irrigation withheld for 48 h, after which F_v/F_m plummeted and leaves became permanently wilted. Our results showed that dehydration affected chlorophyll fluorescence in American chestnut seedlings. Unfortunately, the abruptness at which F_v/F_m transitions from turgor to permanent wilting point suggests a lack of resolution and that chlorophyll fluorescence is not presently a viable method for assessing seedling dehydration stress.

Woolery PO, Schmal JL, Davis AS. 2010. Evaluation of chlorophyll fluorescence as an indicator of dehydration stress in American chestnut seedlings, *Native Plants Journal* 11(1):27–30.

KEY WORDS

seedling quality, nursery production, container seedlings, Fagaceae

NOMENCLATURE

American chestnut: USDA NRCS (2009)

Chestnut blight: ITIS (2009)