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Prediction of planted seedling survival of five Mediterranean species based on initial seedling morphology

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Abstract   Field performance can be predicted by evaluating nursery stock quality, but optimal morphological variables for use in these assessments may vary by species especially under dry Mediterranean conditions. Our objective was to identify initial seedling morphological characteristics that successfully predict field performance of five Mediterranean species (*Pinus halepensis*, *Quercus ilex*, *Quercus coccifera*, *Ceratonia silqua* and *Pistacia lentiscus*). Container seedling morphology was evaluated following the nursery phase, and then seedlings were outplanted in the field where field survival was monitored for two successive years. Results indicate that survival can successfully be predicted from seedling initial morphological characteristics for all these species, yet not all the initial characteristics were good predictors. Survival of *P. halepensis* and *Pist. lentiscus* seedlings was positively correlated to initial seedling root-collar diameter, total dry weight and Dickson's quality index, and can be reliably predicted by these variables. In contrast, seedling field survival of the two Mediterranean evergreen oak species was correlated with few initial morphological attributes; initial diameter provided an accurate index to predict second-year outplanting survival for both species while height/diameter was a good survival predictor for *Q. coccifera* seedlings. For *C. siliqua* seedlings, seedlings with larger initial diameter and total biomass survive better in the field. Thus, diameter was the common variable that accurately predicted survival for all species, which should be >5 mm for *P. halepensis* seedlings and >7 mm for the remaining species.

Keywords   Field performance · Morphology · Outplanting · Prediction models · Seedling quality

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