

## Germination and seedling growth of *Quercus vulcanica*: effects of stratification, desiccation, radicle pruning, and season of sowing

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**Abstract.** Effects of stratification, desiccation, radicle pruning, and season of sowing on *Quercus vulcanica* germination and growth were studied to identify optimum nursery procedures for artificial regeneration of this species. Following stratification (0, 2, 4 and 8 weeks), acorns were germinated, and acorn moisture content and germination performance were also determined at various times during desiccation. In early December unsprouted acorns were planted in containers, and in early April sprouted acorns, which had been stored in polyethylene bags at 4 °C with radicles left intact or with radicles pruned back to 1.0 cm were planted in containers. Stratification at 2 and 4 weeks did not increase germination percentage but significantly increased germination rate. Germination percentage of the seeds dropped when the moisture content of the seeds was reduced by desiccation, and the critical minimum moisture content of the recalcitrant *Q. vulcanica* acorns was found to be 11-16%. Spring sowing of sprouted acorns altered the morphology of the containerized seedlings and caused the formation of significantly more main roots, but resulted in significantly less shoot height and shoot dry weight. Spring-sown sprouted acorns had also a significant advantage over the fall-sown unsprouted acorns in seedling survival, and thus nursery personnel should not be concerned if acorns sprout before sowing.

### Introduction

*Quercus vulcanica* [(Boiss. Heldr. ex) Kotschy] is endemic to Turkey and mainly distributed in Yukari Gokdere provenance, Isparta whose forests have undergone great pressure from mankind (Yaltirik 1984). It is capable of regeneration by seed or by sprouting, and regeneration by seed is important because it is the only way of conserving genetic variability.

Oaks are generally classified into two major groups, the white oak group and the red oak group. With a few exceptions, acorns of the white oak group have little or no radicle dormancy and will germinate after maturing, while acorns of the red oak group exhibit variable dormancy. Stratification or exposure of seeds to cold or warm temperatures for variable time periods is commonly used to enhance germination and uniformity in the nursery. Although variation in stratification requirements exists among species, for red oak species a general recommendation is 4-12 weeks at between 0 and 4 °C and for the white oaks is

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