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<sup>1</sup> -Sitosterol, Stigmasterol, Campesterol, cholestrol  
<sup>۲</sup> - Linoleic Acid, Oleic Acid, Stearic Acid , Palmatic Acid, Palmitoleic Acid , Linolenic Acid , Myristic Acid

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- 3-Anonymus, 1967. Propagation from seed. Pt. 8: Fall planting of fruit and hardwood seeds. Am. Nurseryman, 126(4): 12-13, 85-90.
- 4-Anonymus, 1948. Woody-plant seed manual, U.S. Dep. Agric. Misc. Publ. 654, 416p.
- 5-Asthalter, K., 1980. Causes and site-related occurrence of drought damage and possible inferences for tree species. Allgemeine-Forstzeitschrift, 19:510-512.
- 6-Ivenko, S., 1952. *Sorbus torminalis* – a valuable species for planting in the stepes, Lesn-Hoz, 5(8): 7-35.
- 7-Lanier, N., 1993. Rechercheid, elements de sylvicutre pore L'Alisiae rew. For. Franc. P:319.
- 8- Lobzhanidze, E.D., N.I. Kartvehshvili, L.N.Sinauridze, & M.Sh.Ruknadze, 1991. Anatomical, physical and mechanical properties of wood of the wild service tree, Izvestiva-Vysshikh-Zavedenii Lesnoi Zhurnl, 3: 128-130.
- 9- Meyer, U., 1980. Growing *Sorbus torminalis* in forest district Grohnde. Landes Forest verwaltung, 33:184-193.
- 10- Nederlandsche boschbouw vereening, 1946. Boomzaden: Handleiding inzaake het oogssten, behandelen, bewaren en utizaaien vanboomzaden. Wageningen, 171 p.
- 11- Shoemaker, J.S., P.D. Hargrave, 1936. Propagating trees and shrubs from seed. Alberta Univ. Coll. Agric. Cire. 21, 22p.
- 12-Tsistsa-Tzardi, E., & A. Loukis, 1991. Constituents of *Sorbus torminalis* fruits, Fitoterapia, 62(3): 282-283.
- 13-Van Dersal, W. R., 1938. Native woody plants of United States: their erosion control and wildlife values. US. Dep. Agric. Misc. Publ. 303, 362p.



## The Effects of Sowing Depth and Soil protection for Seed Germination of Service tree (*Sorbus torminalis*) in a Mountainous Nursery

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### Abstract

Increasing the seed germination capacity of Service tree (*Sorbus terminalis*) in a mountainous tree nursery was the main goal in this research, which was carried out in Orimelk nursery, located at 1550 meter altitude, Northern side of Farim Forest in north of Iran. In order to suggest the most suitable method of seed sowing for this species in mountainous nursery, three treatments of sowing depth including 1.5, 2.5 and 3.5 centimeters and two treatments of soil surface protection (with and without mulch) were studied using factorial experimental design in three replications. Analysis of variance showed a significant difference between the two levels of soil protection factor at 0.01 level of probability. The average number of emerged seedlings in the covered plots was two times greater than the other one while, germination rate was not significantly different among the sowing depths of covered plots, but there was a significant difference among the three depths of uncovered plots. In other words, the deeper the sowing depth, the more the number of seed germination. Duncan multiple range test grouped together all three depths of the covered plots and 3.5 cm deep uncovered whereas the rest of the treatments were grouped together.

**Keywords:** Service tree, *Sorbus torminalis*, Seed germination, Nursery, Mulch, Sowing depth

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