



## The effect of hydro and elements priming on fennel (*Foeniculum vulgare*) seed under salt conditions

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### Abstract

In production of medicinal plants, seed germination is very important problem. The treated seeds (control, hydro priming and  $Zn_2SO_4$ ) of fennel (*Foeniculum vulgare*) were evaluated at germination and seedling growth for tolerance to salt ( $NaCl$  and  $Na_2SO_4$ ) conditions at the same water potentials of 0.0, -0.3, -0.6, -0.9 and -1.2MPa. Electrical conductivity (EC) values of the  $NaCl$  solutions were 0.0, 6.5, 12.7, 18.4 and 23.5  $dSm^{-1}$ , respectively. The objective of the study was to determine factors responsible for germination and early seedling growth due to salt toxicity or osmotic effect and to optimize the best priming treatment for these stress conditions. Results revealed that germination delayed in both solutions, having variable germination with different priming treatments. Germination, shoot and weight, root and shoot length were higher but mean germination time and abnormal germination percentage were lower in  $NaCl$  than  $Na_2SO_4$  at the same water potential. The root / shoot weight and R/S length increased with increase in osmotic potential in both  $NaCl$  and  $Na_2SO_4$  solutions.  $NaCl$  had less inhibitor effect on seedling growth than the germination. It was concluded that inhibition of germination at the same water potential of  $NaCl$  and  $Na_2SO_4$  resulted from salt toxicity rather than osmotic effect. Hydro priming increased germination and seedling growth under salt stress. This protocol has practical importance and could be recommended to farmers to achieve higher germination and uniform emergence under field conditions.

**Keywords:** Fennel (*Foeniculum vulgare*), Salt stress, Zinc, Hydro priming, Germination