

Effect of Chemical Treatments and Cold Stratification on Dormancy Breaking in Israel Blue Grapes (*Vitis vinifera* L.) Variety

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Grapes are propagated through seeds to produce new varieties. Seed dormancy in grapes reduces the germination percentage (%) and delays germination, resulting in the low efficiency of breeding programs. The present research evaluated the impact of pretreatment with different chemicals and cold stratification on the dormancy breakage of grape seeds, variety Israel blue. Two factor factorial experiment was conducted under Complete Randomized Design with 20 treatment combinations and four replicates. Exactly 14 seeds were allocated for each replicate. Grape seeds were first soaked in distilled water for 24 hours, followed by soaking in 1000ppm gibberellic acid, hydrogen peroxide, acetic acid, and distilled water (control) for another 24 hours. Then the grape seeds were stratified at 4 °C, 5 °C, 6 °C, 7 °C, and 8 °C for 21 days prior to sown in media consist with sand: topsoil: farm manure at 1:1:1 ratio. They were then placed in a growth chamber at 65 % relative humidity and 30 °C with 16 light hours (12.5 lux) followed by 25 °C with 8 dark hours. Germination %, time duration for germination, shoot length of seedlings, and the number of leaves was measured. Mean separation with Duncan Multiple Range Test was done to determine the best treatment combination using SAS 9.1 version. Germination % was Significance in the application of gibberellic acid with cold stratification under 5 °C. Both treatment combinations of 1000 ppm gibberellic acid and cold stratification at 4 °C and 5 °C had significantly higher germination %, longest shoots and no significance in the number of leaves. The treatment of gibberellic acid for 27 days (short time duration) from the day of grape seed soaking was taken for germination. In conclusion, the combination of gibberellic acid and cold stratification at 4 °C and 5 °C induces dormancy breaking of grape seeds and promotes quick germination in grape variety Israel blue.

Keywords: Grape, Seed dormancy, Stratification, Germination