

Every seed counts: improving the germination success of *Zostera marina* seeds

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Coastal aquatic plants, such as seagrasses, play a pivotal role in maintaining biodiversity and ecosystem function in marine environments by providing essential ecosystem services such as carbon sequestration, water purification, erosion protection, and support for biodiversity.

Regrettably, seagrass populations, particularly those of *Zostera marina*, the most widely distributed seagrass species, are facing significant declines globally.

Global efforts to restore these critical seagrass ecosystems are increasing in prevalence, with seed-based restoration emerging as a cost-effective method that facilitates the upscaling of *Z. marina* restoration initiatives. However, the success of seagrass restoration is hindered by remarkably low germination and seedling establishment rates, reported to be less than 5%.

To address these low germination challenges, our study investigated the effects of hormone priming, with the use of gibberellic acid (GA₃), on the germination of *Z. marina* seeds. We exposed a total of 1500 seeds to ten concentrations of GA₃, and monitored germination success over 60 days. Our results revealed a statistically significant increase in germination success of seeds exposed to GA₃ compared to the control group. Interestingly, both low and high GA₃ concentrations were found to be more effective in stimulating germination compared to intermediate levels of GA₃.

Our findings underscore the great potential of GA₃ priming to substantially improve germination success, providing valuable insights into potential applications of hormone priming as a strategic tool for enhancing germination success in restoration initiatives.

Keywords

Seagrass; *Zostera Marina*; Seed Germination; Hormone Priming; Gibberellic Acid