

Improving germination success for Australian native plant seeds using plasma treatments

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Abstract

Complex seed dormancy in Australian native plants seed can result in low rates of seed germination which is a barrier to conservation and restoration efforts. New seed treatments are sought for plant species where current “best practice” seed germination techniques have low or zero germination success. The focus of this project was to investigate cold plasma as a seed treatment. 13 seed species representing 8 Families of Australian native plants were exposed to cold plasma treatments and germination rates were determined. Results showed no increase in germination percent for 9 species, an adverse effect for 2 species, and beneficial effect for 2 species. For *Commersonia craurophylla*, untreated seeds had 0% germination whereas plasma treated seeds had approximately 80% germination. Plasma’s effects on seeds included colour and texture changes to the seed testa and increased wettability. Water imbibition was measured and modelled where it was found that plasma strikingly changed the dominant mode of water entry from capillary-driven to diffusion-driven. A result was that *C. craurophylla* seeds imbibed 2 times more water than untreated seeds. Results clarify one role that plasma plays in changing the measured kinetics of water entry into treated seeds, which is one aspect that could affect germination.