

Can Seed Treatments Improve Germination of Rare Salt-Marsh Species?®

Patti Kreiberg

Sunset Coast Nursery, 2745 Tierra Way, Aromas, California 95004

The recreation of a salt marsh at the historic Crissy Field in San Francisco calls for the inclusion of a diverse palette of native vegetation. Among the plants desired for reintroduction are several rare or uncommon species.

A study of various methods of seed treatments to test germination rates may facilitate the reintroduction of the rare species.

Seeds of 14 salt-marsh species were collected, dried, and cleaned. Seed were manually graded under a microscope to select samples which appeared the most viable. Viability evaluations were based only on visual clues such as: uniformity in size, seed color, fullness, symmetry, and lack of insect damage. Graded seed were separated into sub-samples for different treatments. Control group plantings were followed by plantings of both salt- and fresh-water-soaked seed and cold stratified for varying lengths of time.

Several species responded well to soaking treatments. Cold stratification following soaking also produced positive results. The results of this study will enable the Golden Gate National Parks Association nursery staff and volunteers to pursue successful seed treatments in propagating these rare species for inclusion in the Crissy Field restoration.

TREATMENT SUMMARY

Control. Plant cleaned, separated seeds in soil at approximate depth of four times the seed width. Cover to soil surface with even-grained soil material, pat gently to insure good soil - seed contact. Water gently and keep evenly moist until germination takes place.

Fresh Water Soak. Using four times more water than seed volume, in clean glass containers, immerse seed in fresh well water (not chemically treated or chlorinated) for 24 h. Filter using unbleached coffee filters (or equivalent). Plant immediately or mix gently with clean, damp perlite, seal airtight in zip lock (or other) plastic bags, label, and refrigerate at 40°F for cold stratification.

NaCl Water Soak. Using commercially obtained sea salt, dissolve 44 g (by weight) of salt in 1 liter of fresh well water (not chemically treated or chlorinated), or use bottled, distilled water to create salt (NaCl) water at concentration of 44 parts per thousand (ppt).

Soak as described for fresh-water soak and filter using unbleached coffee filters (or equivalent).

Rinse seed (by immersion in) fresh well water and filter again. Plant immediately or mix gently with clean, damp perlite, seal airtight in zip lock (or other) plastic bags, label, and refrigerate at 40°F for cold stratification.

GERMINATION PERCENT PER TREATMENT SUMMARY

Percentage germination for seed treatment by species (highest germination percentage = highest success rate). Multiple results are given where percentages for different treatments are equal or very close.

Table 1. Treatments and the germination of rare salt-marsh species.

Species	Treatment	Germination (%)
Annual species		
<i>Castilleja ambigua</i>	Fresh-water soak, cold stratification (4 weeks) (24 days avoids germination in refrigerator)	61
<i>Spergularia marina</i>	Control	34
Perennial species		
<i>Cordylanthus maritimus</i>	NaCl water soak, cold stratification (2 weeks)	59
<i>Eryngium armatum</i>	Fresh-water soak	58
<i>Heliotropium curassavicum</i>	Control	52
<i>Jaumea carnosa</i>	Fresh soak/ stratification (15 days)	82
<i>Plantago maritima</i> var. <i>juncoides</i>	NaCl soak/ cold stratification (2 weeks)	99
<i>Rumex occidentalis</i>	Control	95
	Fresh-water soak	97
<i>Scirpus maritimus</i>	Control	50
	NaCl soak/cold stratification (2 weeks)	50
<i>Spergularia macrotheca</i>	Control	77
<i>Suaeda californica</i>	Fresh-water soak	28
<i>Trifolium wormskioldii</i>	Control	24
	Fresh soak/stratification (2 weeks)	29
<i>Triglochin concinna</i>	Not soaked, but cold stratification 17 days	75
<i>T. maritima</i>	Control	88