

REGENERATION BIOLOGY OF
ERIGERON DECUMBENS VAR. *DECUMBENS*,
AN ENDANGERED PLANT OF
THE WILLAMETTE VALLEY

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SUMMARY

Seed production of *Erigeron decumbens* var. *decumbens* was high (ranging from 160 to 220 seeds per head). However, very few of these seeds (3-29 seeds per head) appeared robust. Of the robust seeds, only a little more than half were viable. When collecting seeds for restoration efforts, the fact that only a small proportion of seeds are likely to be viable should be taken into account.

Traditional tetrazolium (TZ) methods for testing seed viability did not give reliable results, possibly because these methods were generally developed for cultivated species and not "wild" species such as *E. decumbens*. Modifications (using the tetrazolium with cold and gibberellic treatments) improved the match between the number of TZ positives and the number of seeds germinating under optimal conditions.

Tests showed that the viability and germination of seeds of the seeds collected in 1993 and those collected in 1994 were similar. Thus, storing seeds for a year after collection shouldn't be a problem for restoration projects. However, these studies need to be repeated to determine if this pattern is consistent.

The germination test showed that pre-treatment cutting or seed coat scarification is essential for promoting germination of *E. decumbens* seeds. Field sowing of *E. decumbens* seeds may be unsuccessful without prior seed coat scarification. Cutting individual seeds as done in this study before sowing them in the field would be impractical. One recommendation is to determine how seeds are scarified under field conditions. And then use a modification of this method to scarify collected seeds under laboratory conditions. Or modify restoration or management efforts in the field to promote natural seed scarification.

The influence of age (year of seed collection), cutting, gibberellic acid and cold treatment on percent germination were tested using a factorial application of treatments. Results showed significant interactions among these factors. Addition of gibberellic acid to *uncut* seeds had little effect on germination percentages. Addition of gibberellic acid promoted germination for *cut* seeds, but only for those seeds collected in 1993 receiving no cold treatment. The two day cold treatment (4C) appears to inhibit the effect of gibberellic acid. The combination of 1993 seeds with gibberellic acid without cold gave the largest percent germination (83%).

No germination was detected in seeds sowed in pots placed outdoors. It may be that germination occurs at a time of year other than when these pots were monitored, or that conditions necessary for seed scarification were not met. Knowing when seeds germinate in the field is important for timing demographic data collection and for timing restoration efforts.

E. decumbens can be successfully propagated by vegetative cuttings that include a small segment of rhizome tissue. Simple "stem" cuttings that do not include any root or rhizome tissue may also be used, but few of these cuttings survive. Our preliminary study indicates that propagating *E. decumbens* is not a viable propagation technique. Only one seedling has survived.

Understanding the regeneration biology of *Erigeron decumbens* var. *decumbens*, particularly under field conditions, is essential for developing appropriate management and restoration efforts. Promoting conditions for natural regeneration of *Erigeron decumbens* var. *decumbens*, as well as the possibility of augmenting small populations with propagated individuals, is essential for maintaining and increasing the few remaining populations.