

NOTES

These propagation protocols reflect our current practices at Oxbow. They're based on our experience and continual learning. And while they work well for us, they may not be the perfect fit for every context. We're always refining our methods and welcome the shared journey of discovery in native plant propagation.

- Follow the chart from left to right for best results.
- Unless otherwise noted, sow seeds into peat moss.
- For *Balsamorhiza deltoidea* and *Gaillardia aristata*, use a custom mix: 4 parts peat, 4 parts bark, 2 parts perlite, 2 parts sand, and 1 part wood ash.
- "Cone Germ %" refers to the number of cones that produced at least one seedling. It's not a percentage of seed germination.
- You may need to thin seedlings after germination to prevent overcrowding.

TERMS

SCARIFICATION (SCAR): Light abrasion to the seed coat (like with sandpaper, hot water, or mild acid) to mimic natural wear—often what happens when a seed passes through an animal's digestive system.

STRATIFICATION (STRAT): Storing seeds in slightly moist peat moss at either warm (~75°F) or cold (~40°F) temperatures to simulate seasonal changes.

IMBIBING: Soaking seeds in room temperature water to allow them to absorb moisture. For better oxygen flow, you can add a fish tank bubbler (optional).

SPECIES	SPECIES CODE	TRAY SIZE	SEEDS PER CELL	GRAMS PER TRAY	COLLECTION WINDOW	SCAR	15 MIN H2O2 RINSE (1%)	IMBIBE (DAYS)	WARM STRAT (DAYS)	500 PPM GA3 FOR 24 HR	COLD STRAT (DAYS)	CONE GERM %
<i>Acer circinatum</i>	ACCI	10 ci	3/cell	11	Sept-Oct			2			150 days	
<i>Acer macrophyllum</i>	ACMA	10 ci	2/cell	11	Sept-Oct			4			100 days	58%
<i>Achillea millefolium</i>	ACMI	10 ci	5/cell	0.2	Aug-Oct							94%
<i>Achlys triphylla</i>	ACTR	7ci	3/cell	2.2	June-July			1	30		100 days	88%
<i>Actaea rubra</i>	ACRU	green tray		1.5	Aug			1				
<i>Allium cernuum</i>	ALCE	10 ci	8-10/cell	4.825	Aug-Sept	✓		1				99%
<i>Alnus rubra</i>	ALRU	10 ci	pinch	0.5	Sept-Oct							80%
<i>Amelanchier alnifolia</i>	AMAL	10 ci	5/cell	4.5	July-Aug		Before + After Strat	1			90 days	98%
<i>Anaphalis margaritacea</i>	ANMA	7 ci	4/cell		Oct							73%
<i>Aquilegia formosa</i>	AQFO	7ci	6/cell		June-July		✓	1			150 days	5%
<i>Arbutus menziesii</i>	ARME	10 ci	2/cell	0.75			✓	1			60 days	77%
<i>Arctostaphylos uva-ursi</i>	ARUV	7 ci	5/cell	8	Sept-Oct	✓		1	60	✓	90 days	48%
<i>Armeria maritima</i>	ARMA	7 ci	5/cell	0.7	Aug-Sept			1				33%
<i>Aruncus dioicus</i>	ARDI	7 ci	4/cell	0.12	Sept			1				
<i>Asarum caudatum</i>	ASCA	7 ci	2/cell	0.887	July-Aug			1				67%
<i>Cornus nuttallii</i>	CONU	10 ci			Aug-Sept			1			100 days	
<i>Cornus stolonifera</i> (<i>Cornus sericea</i>)	COST	10ci	2/cell	6.3	Aug-Sept		✓	1				95%
<i>Cornus unalaschkensis</i>	COUN	7 ci			Aug-Sept			1			150 days	
<i>Corylus cornuta</i>	COCO	10 ci	1/cell		Aug-Sept			2				72%
<i>Crataegus douglasii</i>	CRDO	10 ci	3/cell	8	Oct-Nov			1				16%
<i>Dicentra formosa</i>	DIFO	7 ci	5/cell	1.55	May-July			1				
<i>Erigeron speciosus</i>	ERSP	7 ci	5/cell	0.1	Aug-Sept							
<i>Eriophyllum lanatum</i>	ERLA	7 ci	5/cell	0.3	Aug-Sept			1				11%
<i>Erythranthe guttata</i>	ERGU	7 ci	pinch	0.01	July-Sept							77%
<i>Erythronium oregonum</i>	EROR	green tray		3.03	May-June							
<i>Festuca roemerii</i>	FERO	10 ci	3/cell	0.1								79%
<i>Fragaria chiloensis</i>	FRCH	7 ci	4/cell	0.3	June-Sept			1			75	
<i>Fragaria vesca</i>	FRVE	7 ci	4/cell	0.3	June-Sept			1			75	71%
<i>Fragaria virginiana</i>	FRVI	7 ci	4/cell	0.3	June-Sept			1			75	91%
<i>Frangula purshiana</i>	FRPU	10 ci	3/cell	14	Aug-Sept		✓	1			75	98%
<i>Fraxinus latifolia</i>	FRLA	10 ci	3/cell	4	Aug-Sept		✓	1			90	76%
<i>Gaillardia aristata</i>	GAAR	7 ci	5/cell	2	Oct-Nov			1				64%
<i>Gaultheria shallon</i>	GASH	7 ci	4/cell	0.15	Aug-Oct							98%
<i>Heuchera chlorantha</i>	HECH	7 ci	5/cell	0.15	Oct							95%
<i>Heuchera micrantha</i>	HEMI	7 ci	5/cell	0.15	Oct							37%
<i>Holodiscus discolor</i>	HODI	10ci	pinch		July-Sept							13%
<i>Hydrophyllum tenuipes</i>	HYTE	7ci	3/cell	5	July-Sept			1				23%
<i>Iris tenax</i>	IRTE	7ci	4/cell	5.6	June			1				99%
<i>Koeleria macrantha</i>	KOMA	10 ci	3/cell	0.1	Aug-Sept							
<i>Lomatium utriculatum</i>	LOUT	10 ci	4/cell	1.5	June-Aug			1				69%

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<i>Lonicera ciliosa</i>	LOCI	7ci	4/cell	8	Sept-Oct		✓	1			90	49%
<i>Lonicera hispidula</i>	LOHI	7 ci	5/cell	4			✓	1			90	
<i>Lupinus polyphyllus</i>	LUPO	7 ci	2/cell	4.25	June	✓		1				94%
<i>Mahonia aquifolium</i>	MAAQ	3 ci	3/cell	12	Aug		✓	2		✓	90	91%
<i>Mahonia nervosa</i>	MANE	3ci	4/cell	12.5	Aug		✓	1	30		90	91%
<i>Maianthemum racemosum</i>	MARA	7 ci	1/cell		Aug-Sept		✓	1				28%
<i>Maianthemum stellatum</i>	MAST	green tray	120 seeds		Aug-Sept		✓	1				
<i>Mentha canadensis</i>	MECA	7 ci	3-5/cell	0.13	Sept-Oct							100%
<i>Myrica gale</i>	MYGA	10 ci	pinch	1				1			45	
<i>Oemleria cerasiformis</i>	OECE	10 ci	2/cell		July-Aug			1			100	
<i>Oplopanax horridus</i>	OPHO	7 ci	2/cell	1.76	Aug - Oct			1	A. 100 C. 100		B. 100 D. 100	
<i>Pedicularis groenlandica</i>	PEDGRO	green tray						1		✓	120	
<i>Penstemon ovatus</i>	PEOV	7 ci	5/cell	0.5	Aug-Sept			1				96%
<i>Penstemon serrulatus</i>	PESE	7 ci	5/cell	0.5	Aug-Sept			1				40%
<i>Philadelphus lewisii</i>	PHLE	10 ci	5/cell	0.025								44%
<i>Physocarpus capitatus</i>	PHCA	10 ci	5/cell	0.5	Sept-Oct			1			30	99%
<i>Polemonium carneum</i>	POCA	7 ci	3/cell	0.88	June-July			1				38%
<i>Populus trichocarpa</i>	POPTRI	10 ci	pinch	0.5	May							100%
<i>Prunella vulgaris</i>	PRVU	7 ci	6/cell	0.5	Aug-Oct			1				22%
<i>Quercus garryana</i>	QUGA	10 ci	1/cell	561	Oct-Nov			3				35%
<i>Rhododendron macrophyllum</i>	RHMA	7 ci	4/cell	0.1								99%
<i>Ribes sanguineum</i>	RISA	10 ci	5/cell	1.5	July-Aug		✓	1				40%
<i>Rosa gymnocarpa</i>	ROGY	10ci	4/cell	6	Nov-Dec			1				59%
<i>Rosa nutkana</i>	RONU	10 ci	5/cell	8	Nov-Dec		✓	1	40		115	32%
<i>Rosa pisocarpa</i>	ROPI	10ci	5/cell	2.5	Nov-Dec			1				31%
<i>Rubus leucodermis</i>	RULE	10 ci	5/cell	0.75	Aug-Sept	✓		1	90		90	
<i>Rubus parviflorus</i>	RUPA	10ci	6/cell	1.1	July	✓	✓	1	60		120	22%
<i>Rubus spectabilis</i>	RUSP	10ci	4/cell	1.5	May-July	✓		1	60		120	73%
<i>Rubus ursinus</i>	RUUR	10ci	5/cell	1	Aug-Sept			1				97%
<i>Sambucus racemosa</i>	SARA	10 ci	5/cell	1.25	July-Aug	✓		1	60		150	
<i>Sidalcea hendersonii</i>	SIHE	7 ci	4/cell	1.5	Aug-Sept			1			60	100%
<i>Sidalcea oregana</i>	SIOR	7 ci	5/cell	1.5	Aug-Sept			1			60	99%
<i>Sisyrinchium idahoense</i>	SIID	7 ci	6/cell	1.3	Aug-Sept		✓	1	60			32%
<i>Solidago lepida</i>	SOLE	10 ci	5/cell	0.5	Sept-Nov							
<i>Sorbus sitchensis</i>	SOSI	green tray		5			✓	1			180	
<i>Spiraea douglasii</i>	SPDO	10 ci	pinch	0.4	Sept-Oct							51%
<i>Symphyotrichum hallii</i>	SYHA	7 ci	pinch		Sept-Nov							85%
<i>Symphyotrichum subspicatum</i>	SYSU	7 ci	pinch	0.49	Sept-Nov							9%
<i>Tellima grandiflora</i>	TEGR	7ci	5/cell				✓	1			150	74%
<i>Thuja plicata</i>	THPL	10 ci	4/cell	0.75				2			30	89%
<i>Tolmiea menziesii</i>	TOME	7ci	5/cell	0.3								93%
<i>Trillium ovatum</i>	TROV	green tray			July-Aug							
<i>Urtica dioica</i>	URDI	7 ci			Aug-Sept							
<i>Vaccinium delicosum</i>	VADE	green tray		0.25	Aug-Oct			1				
<i>Vaccinium membranaceum</i>	VAME	green tray		0.25	Aug-Oct			1				40%
<i>Vaccinium ovalifolium</i>	VAOVL	green tray		0.25	Aug-Oct			1				
<i>Vaccinium ovatum</i>	VAOV	green tray		0.25	Aug-Oct			1				30%
<i>Vaccinium parvifolium</i>	VAPA	green tray		0.25	Aug-Oct			1				
<i>Vancouveria hexandra</i>	VAHE	7ci	2/cell	1	June-July	✓		1				86%
<i>Viola adunca</i>	VIAD	7 ci	3/cell	0.35	June-Oct			1				99%
<i>Viola glabella</i>	VIGL	7 ci	3/cell	0.8	June-Oct			1				47%