

Pregermination Treatment and Stratification of Silverberry Seed

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*Cold stratification treatments for optimal germination of silverberry (*Elaeagnus commutata* L.) were found to be 30 to 90 days at 4 °C. Water soaking in place of the cold stratification period was the least effective of the treatments applied. Tree Planters' Notes (41):24-25, 1990.*

Silverberry (*Elaeagnus commutata* L.) is a native, stoloniferous, thicket-forming shrub useful in reclamation of strip mined lands in the Western United States and Canada.

Successful spring germination of silverberry seed can be accomplished by late fall planting, but situations occur in which stratified seed is required for spring planting. Recommended treatments for germination range from 10 to 90 days of cold stratification (3, 4), endocarp removal (2), and a 2-day water soak to remove a germination inhibitor (1). This study was conducted to determine specific seed treatments that would give optimum germination for spring planting.

Materials and Methods

Fruits of silverberry were collected in September 1985 from 5 plants of accession ND628 at the SCS Bismarck Plant Materials Center evaluation planting at McKenzie, ND. The fruits were cleaned by wet maceration and the seeds allowed to air dry.

They were then stored at 4 °C until removed in October 1985 for use in this study.

The seeds were counted into 28 lots of 100 seeds each to be used in seven treatments, each of which was replicated four times. A cutting test of an additional 400 seeds revealed 97.25% filled seeds.

For three of the treatments, seeds were stratified in damp peatmoss in polyethylene bags at 4 °C for 30, 60, or 90 days. In three other treatments, seeds were soaked in water at room temperature for 2, 4, or 7 days, and the water was changed daily. The seeds were then placed in damp polyethylene bags. The seeds that were soaked in water for 2 days were then stratified at 4 °C for 30 days after soaking. Seeds in the seventh treatment, the control, were placed in peatmoss in polyethylene bags with no treatment.

At the end of each treatment period, the corresponding seed lots were allowed to germinate at room temperature, which ranged from approximately 20 to 30 °C. Germination counts were made weekly for a 4-week period.

Results and Discussion

All treatments resulted in seed germination of 73% or better, but speed of germination varied widely between treatments (table 1).

The control treatment resulted in zero germination the first week and over 88% the second week, with germination continuing into the third and fourth weeks. The water soaking treatments resulted in decreased cumulative germination rate (82 and 73%) at 4 weeks. Seeds that were soaked in water for 2 days and then stratified for 30 days showed 78% germination in the

Table 1—Percent germination of silverberry seed over 28-day period

Treatment	Weekly germination (%)				Cumulative total (%)
	Week 1	Week 2	Week 3	Week 4	
Stratification at 4 °C					
30 days	87.50	4.75	1.50	0.00	93.75
60 days	96.25	0.25	0.00	0.00	96.50
90 days	95.00	0.50	0.00	0.00	95.50
Water soak (2 days) + stratification (4 °C) (30 days)					
	78.25	10.25	0.75	1.00	90.25
Water soak (room temp.)					
4 days	4.75	57.25	16.0	4.25	82.25
7 days	2.00	41.50	20.50	9.50	73.50
Control	0.0	88.25	6.0	0.5	94.75

first week with almost no germination in the second through fourth weeks.

The cold stratification treatments gave excellent first week germination of 87% or greater and minimal second through fourth week germination. The 60- and 90-day cold treatments were superior to other treatments in total germination percentage (95 and 96%) and in speed of germination. There were no elongated radicals in storage in any of the treatments.

No evidence of a germination inhibitor was found within this North Dakota silverberry seed source. Water soaking is not recommended as an aid to germination. When planting silverberry in the spring, cold stratification for at least 30 days and up to 90 days may be used to obtain quick initial germination with optimal germination percentages.

Literature Cited

1. Fung, M.Y.P. 1984. Silverberry seed pretreatment and germination techniques. *Tree Planters' Notes* 35(3):32-33.
2. Hartmann, H.T.; Kester, D.E. 1975. *Plant propagation principles and practices*, 3rd ed. Englewood Cliffs, NJ: Prentice-Hall. 595 p.
3. Olson, D.F. 1974. *Elaeagnus L.* In: Schopmeyer, C.S., tech. coord. *Seeds of woody plants in the United States*. Agric. Handbk. 450. Washington, DC: United States Department of Agriculture: 376379.
4. Vories, K.C. 1981. *Growing Colorado plants from seed: a state of the art*. Gen. Tech. Rep. INT-103. Ogden, UT: USDA Forest Service. 25 p.