

**HORTICULTURE 320  
PLANT PROPAGATION**

**LABORATORY : PRETREATMENT OF SEED TO OVERCOME  
PRIMARY DORMANCY**

<b>Introduction</b>	<p>Many seeds require special treatments before germination can occur. The causes of seed dormancy are varied and include such things as a hard seed coat, an undeveloped embryo, requirement of a particular environmental factor, or the presence of an inhibitor. The inhibition of germination caused by hardseededness and embryo dormancy are common types of dormancy in woody plants. This lab demonstrates the effects of scarification (to overcome hardseededness) and the effects of low temperature stratification (to overcome embryo dormancy) on seed germination/emergence.</p>
<b>Objectives</b>	<ul style="list-style-type: none"><li>•To demonstrate the effects of seed treatments on the germination of seeds which exhibit seed coat dormancy. (Scarification)</li><li>•To demonstrate the effects of seed treatments on the germination of seeds which exhibit double dormancy -- seed coat dormancy and embryo dormancy. (Scarification and Stratification)</li></ul>
<b>Materials</b>	<p><b>Plant material</b> <i>Cercis canadensis</i> - Eastern redbud - hard seed coat, 3 months stratification required.</p> <p>These plants can also be used to evaluate seed pretreatments: <i>Robinia pseudoacacia</i> - Black Locust - hard seed coat, no stratification required <i>Gleditsia triacanthos</i> - Honey Locust - hard seed coat, no stratification required <i>Gymnocladus dioicus</i> - Kentucky Coffee Tree - hard seed coat, no stratification necessary <i>Koelreuteria paniculata</i> - Golden rain tree - hard seed coat, stratification.</p> <p><b>Other material</b> labels and markers propagation medium in flats</p>
<b>Procedures</b>	<p>Seeds of <i>Cercis canadensis</i> (Eastern Redbud) were obtained from two sources: Michigan and Louisiana. Some seeds were scarified by exposure to concentrated sulfuric acid for 10 or 30 min and then stratified for either 45 or 90 days (approximately). Some seeds were not scarified but were similarly stratified. Finally, some seeds were not treated at all. Therefore, there are 5 sets of seeds for each of the two source:</p> <ul style="list-style-type: none"><li>Control</li><li>Scarified, 45 day stratified</li><li>Scarified, 90 day stratified</li><li>45 day stratified</li><li>90 day stratified.</li></ul> <p>Follow these steps:</p> <ol style="list-style-type: none"><li>1. Prepare a label for each treatment indicating the seed source.</li><li>2. Count out 100 seeds for each treatment.</li><li>3. Sow all seed treatments in the flat provided. Be sure to label them correctly.</li></ol>

**Data Collection**

- Record germination data starting with day 4 (Monday) and collect data on MWF of each week through May 12th.
- Record the cumulative number of seed that germinated for each treatment for each sampling day.
- Calculate the germination percentage for each treatment.
- Calculate a germination index for each treatment.
- Evaluate the seedlings for visual characteristics such as damaged cotyledons, necrotic areas, and disease attacks.
- Determine condition of seeds which did not germinate.

**Data Analysis and Report**

1. Write a report on the experiment.
2. Prepare a table and/or graph to display your results.
3. Compare each of the treatments with respect to germination percentage and seed vigor measurements.
  - How effective were each of the treatments?
  - What other treatments might be used to overcome hardseededness?
  - What are the possible drawbacks to using acid for scarification?
  - Does your data support the following information obtained from the Internet (provided by Virginia Polytech Extension)?

*Cercis canadensis* (Redbud)

COLLECTION OF SEED: September to October; dry and clean the seeds, removing any diseased or insect-infested seeds; refrigerated storage in sealed containers

GERMINATION: Seeds have a very hard coat that must be altered before germination can occur. Direct sowing outdoors in the fall best simulates natural conditions; microbes and freezing/thawing will take care of the hard seed coat. To germinate the seeds yourself, you need to scarify the seeds by soaking in sulfuric acid for 30 minutes, then stratify the seeds by placing them in layers of dry peat moss in an airtight container and storing in the refrigerator for three months.

**Deadline for report**

17 May 1995