Lesquerella ludoviciana is an endangered sand prairie plant in Illinois which is only known to occur in Mason County. Its seeds germinate easily. Several factors affect seed vigor of plants. First, environmental conditions coincident with the season of seed development affect vigor. Second, vigor of seed changes with storage. Some seeds have a short period of viability while others remain viable for many years. Third, afterripening can affect seed vigor. In preliminary observations, seed germination within the first several months after harvest was inhibited in this plant. Specific objectives of this study were to determine how season, storage, and afterripening affect seed vigor of silvery bladderpod. Seed was collected during early summer in 1999, 2000, and 2001. Each year seed was germinated on moistened filter paper in petri dishes at 25°C in continuous light. Remaining seed was stored at 4°C and less than 50% relative humidity. Seeds were germinated in the full afterripening year of storage to estimate the roles of season of development and seed storage. Seeds collected in 2001 were germinated every few months to evaluate afterripening. Seeds collected in 1999 displayed no significant difference in germination after one or two years of storage, nor did seed collected in 2000 after one year of storage. This lack of difference indicates that seed does not lose its vigor after storage for one or two years. Determining season of development effects were difficult for 2001 because no seeds germinated from the first collection date. For the second collection date no significant differences were noted between the three seasons of development. Changes in germination indicate that afterripening was not a factor, and no major differences were noted due to season of development or storage.

### Procedure

Seeds of Lesquerella ludoviciana (Nutt.) S. Wats. (silvery bladderpod) were collected in the Henry Allen Gleason Nature Preserve in Mason County in Illinois where it exists in three distinct colonies: 1) North Bowl, lower colony; 2) North Bowl, upper colony; and 3) South Colony. For this study, seeds were collected from only the North Bowl, lower colony. Seed was collected on June 8 and 22, 1999; on June 1 and 16, 2000; and on May 14 and June 6, 2001. Seeds were stored at 4°C and 40-50% relative humidity until germination was tested. In 1999 the germination trials took place in April 2000. For 2000 and 2001 these trials occurred from October through November. In 2001 fifty seeds were germinated monthly after harvest (June, July, and September) with similar conditions in the main trials. These germination trials were conducted to test for afterripening effects. During the germination trials conducted in October of 1999, seeds from 1999 and 2000 were germinated. For the October 2001 trials, seeds from 1999, 2000, and 2001 were germinated.

## Abstract

Lesquerella ludoviciana (Nutt.) S. Wats. (silvery bladderpod) is an endangered sand prairie plant in Illinois which is only known to occur in Mason County. Its seeds germinate easily. Several factors affect seed vigor of plants. First, environmental conditions coincident with the season of seed development affect vigor. Second, vigor of seed changes with storage. Some seeds have a short period of viability while others remain viable for many years. Third, afterripening can affect seed vigor. In preliminary observations, seed germination within the first several months after harvest was inhibited in this plant. Specific objectives of this study were to determine how season, storage, and afterripening affect seed vigor of silvery bladderpod. Seed was collected during early summer in 1999, 2000, and 2001. Each year seed was germinated on moistened filter paper in petri dishes at 25°C in continuous light. Remaining seed was stored at 4°C and less than 50% relative humidity. Seeds were germinated in the full afterripening year of storage to estimate the roles of season of development and seed storage. Seeds collected in 2001 were germinated every few months to evaluate afterripening. Seeds collected in 1999 displayed no significant difference in germination after one or two years of storage, nor did seed collected in 2000 after one year of storage. This lack of difference indicates that seed does not lose its vigor after storage for one or two years. Determining season of development effects were difficult for 2001 because no seeds germinated from the first collection date. For the second collection date no significant differences were noted between the three seasons of development. Changes in germination indicate that afterripening was not a factor, and no major differences were noted due to season of development or storage.

### Literature Cited


### Percent Germination of Seed Germinated in the Year Harvested

<table>
<thead>
<tr>
<th>Year</th>
<th>First Harvest - Early</th>
<th>First Harvest - Late</th>
<th>Second Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>68 ± 3</td>
<td>52 ± 2</td>
<td>72 ± 2</td>
</tr>
<tr>
<td>2000</td>
<td>52 ± 2</td>
<td>38 ± 2</td>
<td>50 ± 2</td>
</tr>
<tr>
<td>2001</td>
<td>52 ± 2</td>
<td>38 ± 2</td>
<td>50 ± 2</td>
</tr>
</tbody>
</table>

No germination was recorded for seed from the first harvest in 2001. The first harvest displays a difference between the 1999 and 2000 seed in both maturities. For the second harvest 2000 seed displays a difference from the 1999 and 2001 seed. This response also is shown in the figures below.

### Summary

- Seasonal differences in germination were observed.
- No overall major decreases in germination were observed due to storage.
- Afterripening trials for germination were inconclusive due to immature seed at the early harvest.

### Percent Germination of 1999 Seed After Storage

<table>
<thead>
<tr>
<th>Year</th>
<th>First Harvest - Early</th>
<th>First Harvest - Late</th>
<th>Second Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>68 ± 3</td>
<td>58 ± 3</td>
<td>60 ± 7</td>
</tr>
<tr>
<td>2000</td>
<td>20 ± 3</td>
<td>26 ± 6</td>
<td>12 ± 4</td>
</tr>
<tr>
<td>2001</td>
<td>72 ± 2</td>
<td>74 ± 6</td>
<td>80 ± 4</td>
</tr>
</tbody>
</table>

Overall no major decreases in germination were observed due to storage.

### Percent Germination of 2000 Seed After Storage

<table>
<thead>
<tr>
<th>Year</th>
<th>First Harvest - Early</th>
<th>First Harvest - Late</th>
<th>Second Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>52 ± 2</td>
<td>52 ± 3</td>
<td>38 ± 2</td>
</tr>
<tr>
<td>2001</td>
<td>26 ± 1</td>
<td>40 ± 1</td>
<td>32 ± 2</td>
</tr>
</tbody>
</table>

### Germination Rate of Seed Germinated in Year Harvested

#### Germination Rate of Seed Germinated in 1999

- First Harvest - Early: 68 ± 3%
- First Harvest - Late: 58 ± 3%
- Second Harvest: 60 ± 7%

#### Germination Rate of Seed Germinated in 2000

- First Harvest - Early: 20 ± 3%
- First Harvest - Late: 26 ± 6%
- Second Harvest: 12 ± 4%

#### Germination Rate of Seed Germinated in 2001

- First Harvest - Early: 72 ± 2%
- First Harvest - Late: 74 ± 6%
- Second Harvest: 80 ± 4%

### Germination Rate of 2000 Seed After Storage

- First Harvest - Early: 52 ± 2%
- First Harvest - Late: 26 ± 1%
- Second Harvest: 38 ± 2%

### Germination Rate of 2001 Seed After Storage

- First Harvest - Early: 52 ± 2%
- First Harvest - Late: 40 ± 1%
- Second Harvest: 32 ± 2%

### Germination Rate of Afterripening Trials

#### Germination Rate of 5/14/01 Harvest

- 6/15/2001: 60 ± 5%
- 7/2/2001: 70 ± 5%
- 9/3/2001: 70 ± 5%
- 11/11/2001: 70 ± 5%

#### Germination Rate of 6/6/01 Harvest

- 7/11/2001: 60 ± 5%
- 9/23/2001: 70 ± 5%
- 11/11/2001: 70 ± 5%

Germination decreased between the 7/11 and 9/23 trials but increased again between the 9/23 and 11/11 trials.