

# GERMINATION OF *LESQUERELLA LUDOVICIANA* AS AFFECTED BY SEED AGE.

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A *Lesquerella ludoviciana* flower stalk

## INTRODUCTION

*Lesquerella ludoviciana* (silvery bladderpod) is a native plant that is endangered in Illinois. Other than descriptive information, habitat location, and reports of its existence, little is known about *Lesquerella ludoviciana* at the eastern edge of its range (Herkert, 1991). More knowledge of the plant's reproductive strategy is needed to make sound management decisions to maintain the plant in Illinois. At present, the only place that it naturally occurs in the state is in a sand prairie on the Henry Allen Gleason Nature Preserve in Mason County. Three colonies of *Lesquerella ludoviciana* exist in the Nature Preserve with visible differences between them (Ebinger and McClain, 1999, Unpublished). Combined the colonies are 2,982 m<sup>2</sup>. In 1999, the estimated population of *Lesquerella ludoviciana* plants within the three colonies was 11,420. The relative amount of open sand within each colony varied, with open sand decreasing as the number of different plant species increased.

Seed vigor varied for seed collected in 1999 when differences were found between seed collection dates and position on the flower stalk (Coons, et al., 2000). Germination differed between seeds developed later or earlier on the flower stalk for the first collection date (June 8, 1999), with those from the earlier portion having a higher percentage. This difference was likely due to seed maturity. Percentage germination for seeds collected from the later portion of the flower stalk on the second collection date (June 22, 1999) was similar to that of seeds from the earlier portion on the first collection date. Again this response probably relates to seed maturity.

In order to understand the reproductive biology of *Lesquerella ludoviciana* better, other answers about its seed vigor need to be known. Little is known about yearly variations in seed vigor or if storage affects seed vigor. It is not clear whether the maturity effects observed in 1999 are typical for the species. Hence, the objective of this study was to investigate how several factors related to seed age (including season collected, harvest date within season, and storage) affect seed vigor.



Two *Lesquerella ludoviciana* plants growing in 6" pots

## PROCEDURE

Seeds were collected from the largest of the three plant colonies within the Henry Allen Gleason Nature Preserve. Seeds were collected on June 8 and 22, 1999, and June 1 and 16, 2000. Seeds collected on the first date of each year were split into two groups, i.e. early (lower half of the flower stalk) and late (upper half of the flower stalk). The second collection date contained only seeds from the upper stalk since all fruit from the lower stalk had already dehisced. Seeds were stored at 4.5°C and 40-50% relative humidity until germination was tested in October 1999 and April 2000 for only 1999 seed collection) and in October through November 2000 (for both 1999 and 2000 seed collections).

Two sheets of filter paper (Whatman #1) were placed in a plastic petri dish (10 x 1.5 cm) with 5 ml deionized water. The dishes then were sealed with parafilm. Fifty seeds from each seed maturity were used. All seeds were dusted with Thiram (50% active ingredient, tetramethylthiuram disulfide) prior to use for fungal control. Ten seeds from each group were placed in each dish, with five dishes (replications) per group. These dishes then were placed randomly in a plastic container (Rubbermaid, 41 x 28.5 x 17.5 cm) and placed in a controlled plant culture room at approximately 25°C with 4.5 µmoles/m<sup>2</sup>/sec of light for 16 or 24 hours. Germinated seeds were counted with a seed considered germinated if the radicle was evident.

Data were analyzed using analysis of variance. The CoStat program was used for statistics, and to determine means and standard deviations of each seed group.

## ABSTRACT

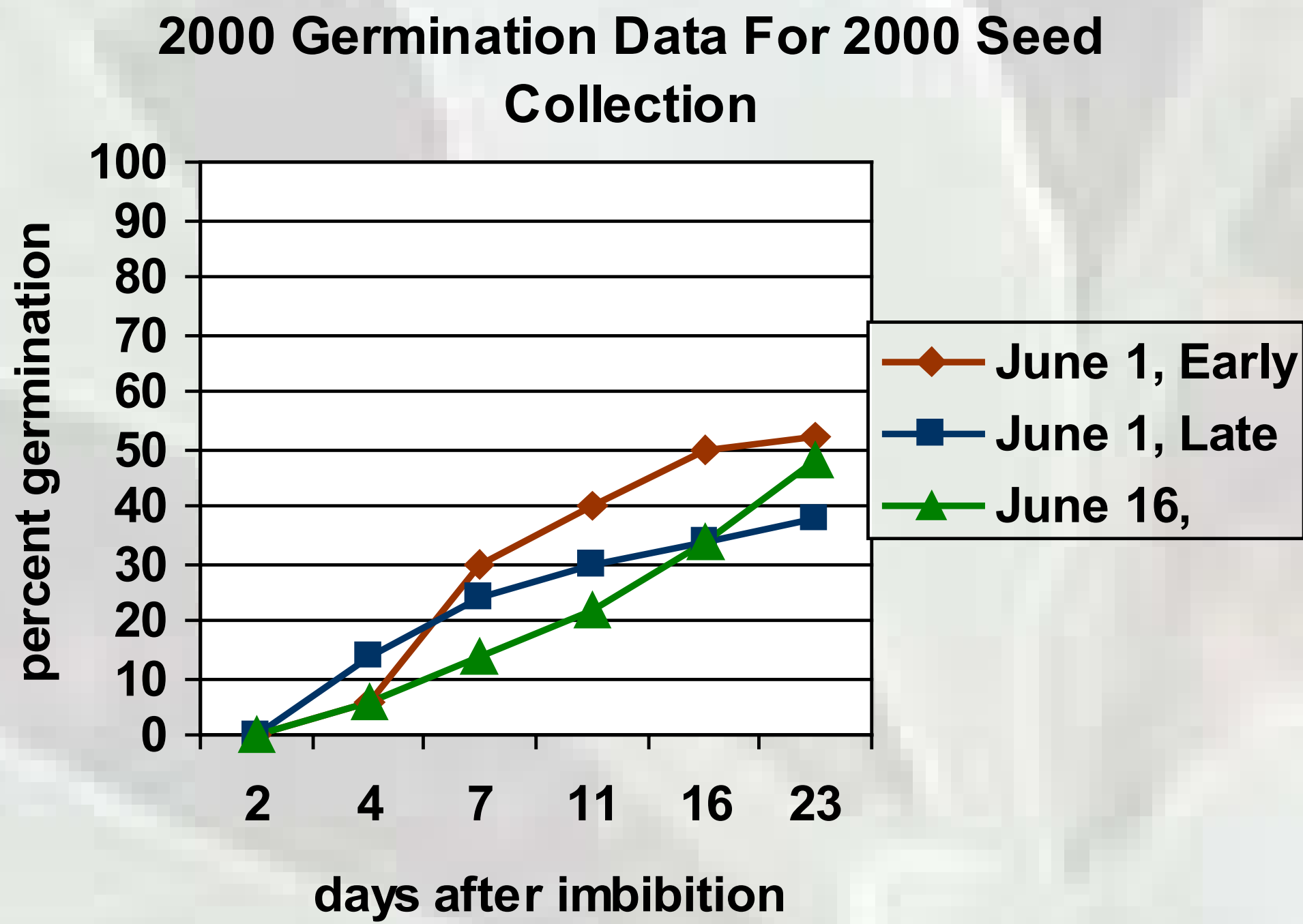
*Lesquerella ludoviciana* (Nutt.) S. Wats. (silvery bladderpod) is a native, endangered, sand prairie plant in Illinois. The only location where the plant currently exists in Illinois is in the Henry Allen Gleason Nature Preserve in Mason County. Seed was collected on June 8 and 22, 1999, and on June 1 and 16, 2000. On June 1 and 8, seed was divided into early (lower portion of the flower stalk) and late (upper portion of the flowering stalk) flowering groups. On June 16 and 22, only the late flowering group was still on plants. Seeds were germinated on moistened filter paper in plastic petri dishes at 25°C in continuous light. Germinated seeds were counted approximately every two to three days. Overall, storage had little effect on germination of 1999 seed that was germinated in fall 2000. For seed that was not stored, germination percentages ranged from 20% to 72% in 1999 and from 38% to 52% in 2000. Seed from the late flowering group had a higher germination rate when it was from the second collection date than from the first collection date indicating maturation effects. Thus, several factors affected germination including storage, season, and harvest date.

## OBJECTIVES

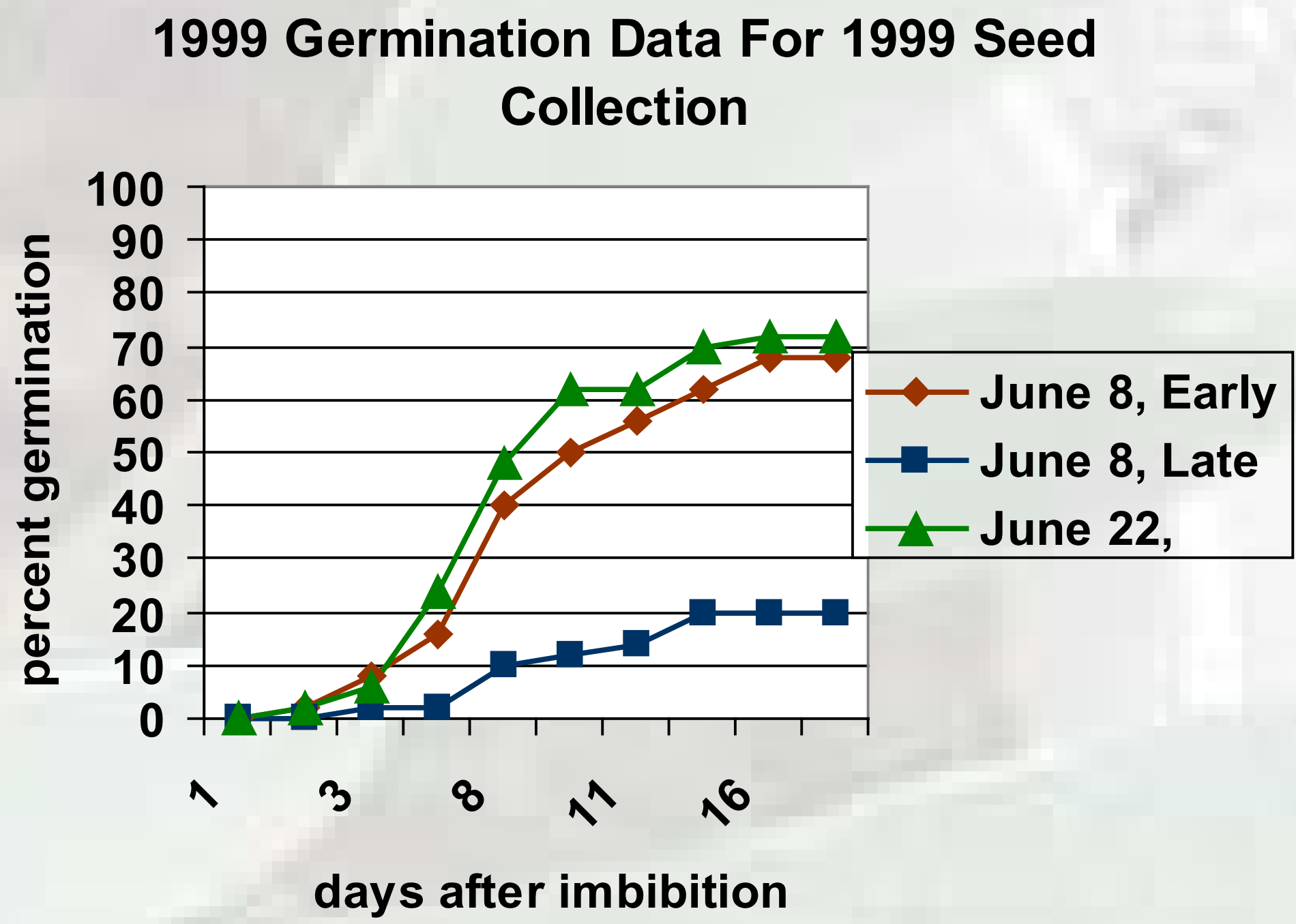
The overall goal is to understand the reproductive biology of *Lesquerella ludoviciana* to improve management decisions for its maintenance in Illinois at the Henry Allen Gleason Nature Preserve.

The objectives of this study were to compare:

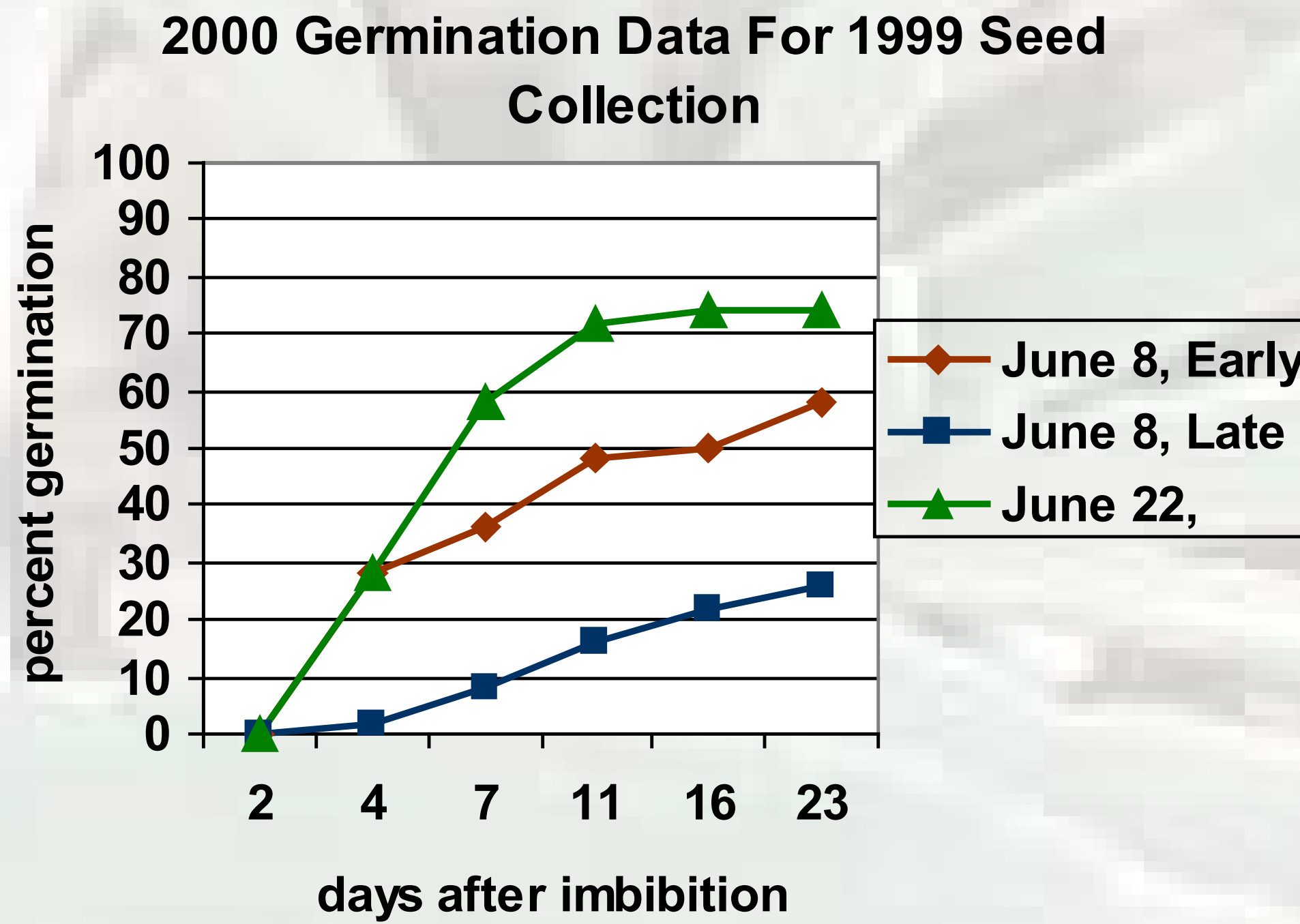
- 1) Initial vigor of seed collected in different years (1999 vs. 2000).
- 2) Vigor of seed after a year of storage (collected in 1999)
- 3) Vigor of seed collected on different dates within a year (early vs. late maturing fruit)



There is no significant difference between the different harvest dates for the seed collected in 2000. Overall, the germination rate of the 2000 seed was lower than that of seed collected in 1999.



Seed Collected and germinated in 1999 displayed a significant difference between the June 8, late seed and the other two maturities. The germination rate shows the difference between the seed maturities as well.



The stored seed showed no significant difference in germination rate or germination percentage from the seed collected in the same season and germinated without storage. There was a significant difference between the June 8, late seed and the other two maturities.

Table 2: Comparison of Germination Percentages For Seeds Collected in Different Years

	First Collection, Early	First Collection, Late	Second Collection
1999 Seed	68 ± 11	20 ± 10	72 ± 16
2000 Seed	52 ± 19.2	38 ± 19.2	48 ± 29.5

Table 2 indicates a significant difference in Germination Percentages between the different harvest dates.

Table 1: 1999 Seed Collection Final Germination Percentages for Year Germinated

	June 8, Early	June 8, Late	June 22
Germinated in 1999	68 ± 11	20 ± 10	72 ± 16
Germinated in 2000	58 ± 8.4	26 ± 18.2	74 ± 18.2

Table 1 indicates a significant difference between June 8, late and the other seed maturity groups

## LITERATURE CITED

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The largest colony of *Lesquerella ludoviciana*



*Lesquerella ludoviciana* plants in flower