

Maturity and Viability of Boxelder Maple Seeds

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The viability of boxelder maple seed gradually increased during each of four weekly harvests to a maximum of 75 percent. During this period, the moisture content of the seeds fell from 65 to 50 percent. As moisture content continued to fall below 50 percent, seed viability stabilized and then declined.

Boxelder maple (*Acer Negundo* L.) is used for shelterbelt planting in the Plains region, but information on seed maturity and viability for nursery operations is limited. The seeds have been reported to ripen in the fall (2, 3), and harvesting on September 5 (4) or at 57-percent moisture content (1) is recommended.

Methods

Seeds were harvested in 1970 from two trees at 10 weekly intervals from August 3 to November 2. The seeds were spread to dry in the greenhouse for 2 days. All seeds that appeared abnormal were then discarded and the balance stored in polyethylene bags at 35° F (2° C).

Moisture content, as a percentage of the fresh weight of the seeds, was determined at the time of each harvest. This was done by oven-drying three samples of 10 seeds at 212° F (100° C) for 24 hours. On December 30, 350 seeds from each tree and harvest were surface-sterilized. These seeds were then

stratified in moist sand at 41° F (5° C) for 90 days.

Viability of the stratified seeds was evaluated by the germination of greenhouse sowings in flats containing a sterilized 2:1 soil-to-sand medium. Ten rows of 25 seeds for each date of harvest and tree were sown in each flat and replicated six times. Sowings were watered as required. Germination was recorded twice weekly for 30 days. Percentage data were transformed for analyses of variance to determine the significance of mean differences, but are reported as percentages.

Results and Discussion

Mean moisture content of the seeds gradually and significantly decreased for the first six successive harvest dates (table 1). The moisture content increased significantly on October 13 and decreased on October 17, but then increased for the last two harvests. Moisture content of seeds for both trees had the same trends. Cram and Worden (1) reported similar decreases for the moisture content of boxelder maple seeds in 1956, from 67 percent on August 26 to a low of 11 percent on October 3.

Rainfall recorded during harvest intervals appeared to modify the moisture content of maple seeds. However, this occurred for some harvest dates, but not for others. Little, if any, rainfall appeared to be absorbed by maple seeds with more than 50-percent moisture, whereas

Table 1.—Moisture content and germination capacity of boxelder maple seeds for 10 consecutive weekly harvests (means for two trees)

Dates of harvest	Moisture ¹ content	Germination ² capacity
----- % -----		
August 31	65.1a ³	44.7d
September 8	60.7b	55.4bc
14	53.5c	62.7ab
22	49.1d	74.0a
28	21.1f	55.7bc
October 5	11.4h	56.0bc
13	16.0g	56.4bc
19	13.0h	33.4e
26	23.3f	18.0f
November 2	26.8e	26.8e

¹Moisture content as a percentage of wet weight for three samples of 10 seeds after oven-drying for 24 hours at 212° F.

²Germination capacity as a percentage for six replications of 25 seeds sown after stratification for 90 days at 41° F.

³Means within a column followed by a common letter are not significantly different at the 5-percent level.

significant amounts of rain were absorbed by the more mature seeds with 11- to 23-percent moisture.

Germination capacity of the seeds gradually increased for the first four harvest dates to a maximum of 74 percent on September 22 (table 1). It then decreased to 56 percent for the next three harvests (to October 13). Germination for the last three harvests was significantly inferior. Germination of seeds for the two individual trees followed similar trends, but at different levels. Although maximum germination was recorded for the September 22

harvest of both trees, the levels were 65 percent for one tree and 83 percent for the other. The average germination of seeds for all 10 harvests of one tree was 37 percent, but 60 percent for the other. Thus, seed viability of the two trees differed greatly.

Viability of maple seeds apparently was at a maximum when the average seed moisture decreased to 49 percent (table 1). Viability then appeared to fall to 56 percent and remained constant for three subsequent harvests. During this period, the moisture content decreased to 11 percent and then increased to 16 percent. Later harvests showed lower seed viabilities.

Conclusion

Boxelder maple seeds should be harvested when the moisture content is 50 percent or less. Large-scale harvesting can be continued for several weeks, but should be terminated when the seed moisture rises above 16 percent after late fall rains.

Literature Cited

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