

Native Seed Cleaning: The Oregon Seed Blower

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Summary

Mt. Cuba Center has explored the use of the Oregon Seed Blower in native seed cleaning which has proven to be effective for cleaning native seeds with pappus or calyx structures. The blower successfully removes lighter debris and unviable seed from the most samples, resulting in clean

seed for storage and sowing. While not suitable for all species and situations, the Oregon Seed Blower can be a useful tool for operations that store and/or propagate small to medium amounts of seeds. This paper describes the function of the Oregon Seed Blower and shows the process for cleaning *Solidago rugosa* var. *apsera*.

INTRODUCTION

Mt. Cuba Center is public garden in Hockessin, DE whose mission is to inspire an appreciation for the beauty and value of native plants and a commitment to protect the habitats that sustain them. Mt. Cuba's greenhouse facility focuses on conservation-related propagation, plant production, and research. At Mt. Cuba Center, we typically handle smaller samples of seed compared to a large commercial nursery and tend to store seed for longer periods of time.

The Oregon Seed Blower, produced by Hoffman Manufacturing Inc., is a simple yet effective machine that removes small, lightweight debris from seed samples and separates unviable seeds from viable seeds. It is described as an "economical laboratory"

machine, meant for operations that need to separate seeds by mass or have a laboratory-like setting. There are two models available: the original freestanding model and the compact tabletop model. The blower is operated with a 5-minute timer. It utilizes airflow generated by a blower motor that pushes air through a column (Fig. 1A). The air lifts lightweight debris or empty seeds into the removable cups on each side of the column (Fig. 1B), while heavier, viable seeds stay in the bottom cup (Fig. 1C). Airflow is controlled by an adjustable cap at the top of the air column (Fig. 1D). The Oregon Seed Blower is essentially using the winnowing method for seed cleaning in a controlled environment.

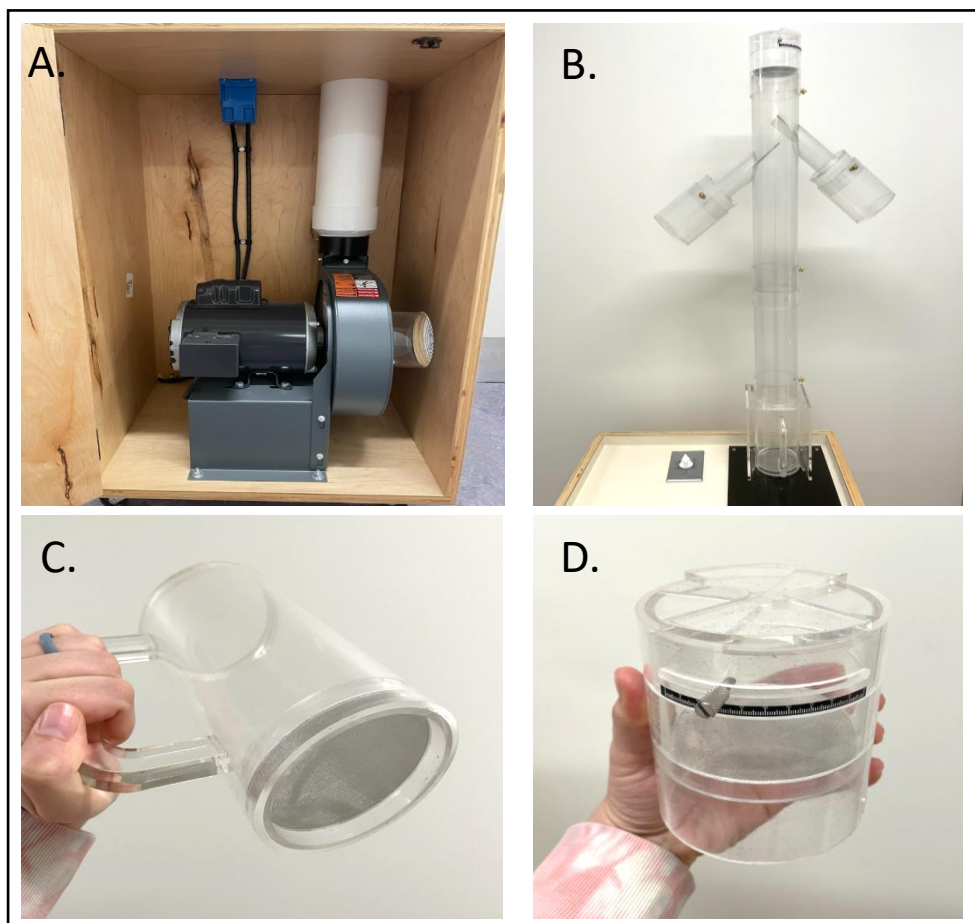


Figure 1. Oregon Seed Blower. A) Blower motor. B) Air column. C) Bottom cup with mesh. D) Air flow adjustment cap.

Through much experimentation, I have learned there are two ideal seed types to clean with the Oregon Seed Blower. Seeds in the *Asteraceae* family that have a pappus structure are a great candidate for this machine due to the light weight of the fluffy debris. *Asteraceae* species that I have cleaning using the blower include: *Solidago*, *Symphotrichum*, *Vernonia*, *Eutrochium*, *Liatris*, and *Cirsium*. The other seed type that works well with this machine is species that contain seeds inside of a calyx or other papery covering. This includes: *Pycnanthemum*, *Monarda*, *Verbena*, *Rumex*, and others. On the Hoffman Manufacturing website, they mention that hemp growers and grass seed farmers may also use this machine.

Before utilizing the Oregon Seed Blower, it is necessary to perform bulk cleaning of the seed samples. Pappus and

calyx structures must be removed from the seeds. The two tools I find most effective for this process include the Debearder, also made by Hoffman Manufacturing Inc., and various screens/sieves (**Fig. 2**).

The Debearder consists of a wooden trough and a paddle, both lined with texturized rubber. Placing the seed sample into the trough and gently passing the paddle over it removes pappus as well as papery coverings. Screens and sieves can be used to release seeds from a calyx and are especially useful when still attached to the flower heads (**Fig. 2B**). It is important to note that the Oregon Seed Blower will not always remove all debris from a seed sample and may require multiple runs to fully clean the seeds. Even still, there may be remaining debris that is the same weight as the seeds and therefore unaffected by the airflow.



Figure 2. A) Hoffman debearder and pan sieves. B) Removing calyx parts from *Pycnanthemum*.

Cleaning *Solidago rugosa* var. *aspera*

One seed cleaning protocol I have developed involving the Oregon Seed Blower is

for *Solidago* sp. In this example, I cleaned a sample of *Solidago rugosa* var. *aspera*. After harvest, the unclean seed was allowed

to dry for several months. First, the seed was manually plucked and shaken from the stems (**Fig. 3A**). Next, the sample was placed in the Debearder to remove pappus and crush large debris into smaller particles (**Fig. 3B**). The seeds and debris were placed in the bottom cup of the Oregon Seed Blower. The blower ran for 2 minutes at the lowest airflow setting. The airflow from the blower successfully floated the pappus and empty seeds into the removable side cups

on the column while the viable seeds remained in the bottom cup.

After running through the blower, the seeds were screened with a #20 sieve to remove any heavy debris that was smaller than the seeds. The remaining seeds were mostly clean, with only a small amount of debris remaining that was the same size as the seeds and not light enough to be removed with the blower (**Fig. 3C**).

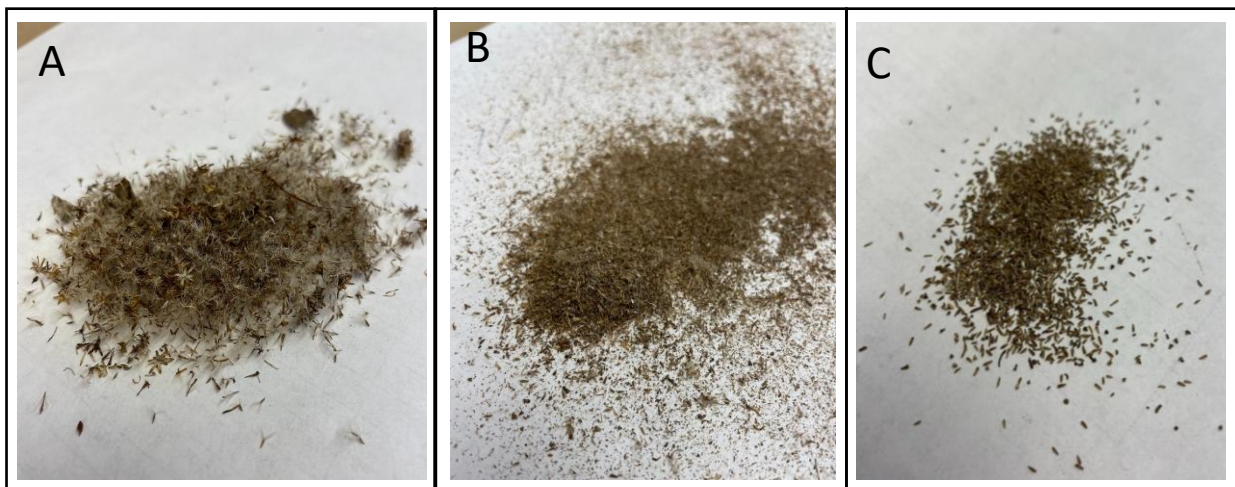


Figure 3. Seed cleaning in *Solidago*. A) Seeds manually plucked for seed heads. B) Debarbed seeds. C) Seed sample after using the seed blower.

Ten of the cleaned seeds were cut in half to observe viability and all the seeds contained full, white embryos with no evidence of pests, assuming 100% viability in this sample. By Mt. Cuba's standards, this sample is considered clean enough for sowing and long-term storage.

Conclusion

Native seed cleaning is an art as much as it is a science. Developing effective cleaning techniques for each species requires trial and error, combining all available tools at different capacities until the seed is sufficiently clean. A cleaning method that works for one operation may not work for another due to the size of samples being cleaned or

the end goal for the seed. At Mt. Cuba Center, The Oregon Seed Blower has proven to be effective at removing debris and empty seeds from viable seeds in the Asteraceae family with pappus, or seeds within a calyx or other papery covering.

Using tools such as a mycorrhizal slurry, mist systems, and Bioplex you are able to harvest plants in leaf which ensures multiple crop rotations. This system is excellent for growers who are operating on a small square footage and are trying to produce the most plants possible.