A LABORATORY TECHNIQUE FOR DEPULPING JUNIPERUS CONES

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The seeds of many coniferous taxa are released easily upon maturation from dry, woody or leathery cones. *Juniperus* seed, however, is held securely within fleshy or berry-like cones. These small, pulpy and resinous cones contain relatively few seeds, and cannot be extracted by drying or shaking. A depulping procedure, involving maceration and flotation in liquid, is required to separate the seed from the cones (*3, 1, 2*).

This note describes how to process relatively small lots of Juniperus cones in the laboratory to obtain clean, sound seed for use in forest genetics or tree improvement investigations.

Equipment and Materials

MIXER, reducing and emulsifying, large, three-speed, 5-qt., Waring Commercial Blender (fig. 1)
RHEOSTAT, variable speed autotransformer, type 3FN126,120 volts, 15 amps, Powerstat, The Superior Electric Co., Bristol, Conn. (fig. 1)
CAN, Coffee. (1 lb, 1 qt)
BUCKET, Plastic or metal, 5-gal
BUCKET, Plastic or metal, 30-gal
DETERGENT, powder
TEASPOON, plastic or metal
TIMER, interval, 15 seconds to 10 minutes (fig. 1)

Figure 1.—*Three-speed commercial blender (mixer), variable speed autotransformer (rheostat), and timer used to depulp Juniperus cones.*

Technique

1. Fill 1 lb coffee can with juniper cones (1 qt).
2. Fill mixer ½ full of water (2 ½ qts.).
3. Empty cones from coffee can into mixer.
4. Turn variable speed transformer to 0 setting; turn mixer to high setting.
5. Turn variable speed transformer to:
   (a) setting 20 for 30 seconds; then
   (b) setting 25 for 3 minutes[1]

[1]Settings and times will vary slightly with different species, depending on size and condition of cones. Settings above 40, however, may break or crack some juniper seed; and a maceration time of more than 5 minutes seems unnecessary, at least for juniper.

6. Pour contents (macerated pulp, seeds, and water) from mixer into 5 gal bucket.
7. Add warm water to 5-gal bucket—preferably forcefully through a sink sprayer attachment—until ¾ or more full.
8. Stir thoroughly and allow contents to stand (¾ minute) while the sound seed settles to bottom of bucket.
9. Slowly pour off floating pulp, empty seed, and water into 30 gal bucket; sound seed remain at bottom in ½ - to ¾ -inch of remaining water.
10. Fill mixer ½ to ¾ full of warm water.
11. Pour sound seed and remaining water into mixer.
12. Add 1 to 2 (tsp) of powder detergent.
13. Turn variable speed transformer to setting 20 for 5 to 7 minutes.
14. Pour mixer contents through sieve, retaining the seed.
15. Dry the seed, package and store; or stratify as required per species or use.

Discussion

This technique was developed for depulping small lots of eastern redcedar (*Juniperus virginiana* L.) and Rocky Mountain juniper (*J. scopulorum* Sarg.) cones in the laboratory. It saves time by eliminating the commonly used steps of presoaking the cones in water and soaking the seed in a lye solution after maceration to free the seed of residual resins.

The equipment and technique can be adjusted and modified for the extraction of seed from cones, berries, or fruits of a number of other plant taxa in which the extraction by drying and shaking is either difficult, tedious, or not possible. For these, variations in the speed and length of macerating will need to be adjusted to accommodate such variables as cone size and hardness, and seed size and strength. Until the proper settings and times have been determined for a given taxon, the mixer speeds should be low, and times of maceration should be short.

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