Is seed cleaning necessary?

• Challenges
  • Availability
  • Time
  • Cost
  • Coordination

• Benefits
  • Known viability
  • Known purity
  • Provides options for sowing
  • Storage potential
What does the extractory provide?

- Extracts, cleans and stores seed
  - Any governmental agency
  - (USFS, BLM, USFWS, NPS, Fed. Hwy., BIA, Tribes)
- Over 3,000 native plant species
- Provides granary & freezer storage
- Arranges for testing & shipping
- Maintains seed inventory database
- Information hub
How is seed processed?

Machines:
- Screens
- Air
- Motion

Seed separation
- Machines exploit the difference in physical properties of target seed and non-target material.
What does processing look like?

Raw Material

Seed with Inert and Non-target Material

Pure Seed

Seed with Inert Material
What information do we have?

- BSE has records associated with every collection
  - Incoming weight
  - Processing notes
    - Machines used and settings
    - Time spent
  - Final weight
  - In-house testing
  - Certified testing results
  - Final processing reports
**How can data help?**

*Atriplex canescens* (ATCA2)
- 10,000 pure live seed (PLS) are required for long-term storage
- 5,000 PLS are needed for nursery grow out.

Average yield data show that approx 7,700 PLS/lb of raw wt. can be expected for ATCA2, so…

\[
15,000 \text{ PLS} / 7,700 \text{ PLS/lb} = 1.94 \text{ lbs raw material needed}
\]

* Average PLS/lb of raw wt. was used in this calculation instead of yield (%) or seeds/lb because ATCA2 typically finishes with a lower than desired percent purity and/or percent fill due to limitations in the extraction process. This is typical of many *Atriplex* species, conifers, and species producing fleshy fruit. If unsure, make calculations using all methods and take the highest number for field collection.
### SHRUBS

<table>
<thead>
<tr>
<th>GENUS</th>
<th>SPECIES</th>
<th>AVG YIELD (%)</th>
<th>AVG PLS/LB RAW WT</th>
<th>AVG SEED/LB</th>
<th># OF RECORDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambrosia</td>
<td>dumosa</td>
<td>28</td>
<td>15,373</td>
<td>78,563</td>
<td>43</td>
</tr>
<tr>
<td>Artemesia</td>
<td>tridenta ssp. tridentata</td>
<td>6</td>
<td>109,629</td>
<td>2,220,807</td>
<td>47</td>
</tr>
<tr>
<td>Artemesia</td>
<td>tridenta ssp. wyomingensis</td>
<td>4</td>
<td>62,887</td>
<td>1,716,151</td>
<td>61</td>
</tr>
<tr>
<td>Atriplex</td>
<td>cansecens</td>
<td>28</td>
<td>7,726</td>
<td>55,975</td>
<td>93</td>
</tr>
<tr>
<td>Atriplex</td>
<td>confertifolia</td>
<td>26</td>
<td>11,123</td>
<td>102,309</td>
<td>60</td>
</tr>
<tr>
<td>Atriplex</td>
<td>polycarpa</td>
<td>5</td>
<td>165,597</td>
<td>1,210,903</td>
<td>35</td>
</tr>
<tr>
<td>Cercocarpus</td>
<td>ledifolius</td>
<td>21</td>
<td>7,704</td>
<td>45,054</td>
<td>62</td>
</tr>
<tr>
<td>Chrysothamnous</td>
<td>viscidiflorus</td>
<td>5</td>
<td>29,940</td>
<td>889,877</td>
<td>53</td>
</tr>
<tr>
<td>Ericameria</td>
<td>nauseosa</td>
<td>8</td>
<td>37,575</td>
<td>621,749</td>
<td>102</td>
</tr>
<tr>
<td>Krascheninnikovia</td>
<td>lanata</td>
<td>5</td>
<td>8,787</td>
<td>236,802</td>
<td>48</td>
</tr>
<tr>
<td>Larrea</td>
<td>tridentata</td>
<td>18</td>
<td>14,177</td>
<td>116,269</td>
<td>53</td>
</tr>
<tr>
<td>Ribes</td>
<td>cereum</td>
<td>6</td>
<td>13,718</td>
<td>308,321</td>
<td>26</td>
</tr>
<tr>
<td>Salvia</td>
<td>dorrrii</td>
<td>4</td>
<td>5,736</td>
<td>150,149</td>
<td>15</td>
</tr>
<tr>
<td>Symphoricarpos</td>
<td>albus</td>
<td>4</td>
<td>2,021</td>
<td>66,786</td>
<td>32</td>
</tr>
<tr>
<td>Tetradymia</td>
<td>canescens</td>
<td>3</td>
<td>2,765</td>
<td>116,811</td>
<td>20</td>
</tr>
</tbody>
</table>

Kate Pavich, an SCA Team Member with the BLM Bishop Field Office (California) collecting seed at the Volcanic Tablelands. Photo by Student Conservation Association
Seed Increase: Processing Large Quantities
Elymus elymoides
bottlebrush squirreltail
Achnatherum occidentale
western needlegrass
Successes and Challenges of Large Quantities

- *Lomatium cookii*
  - Multiple flowers per plant, various heights
  - Seed attached to umbel
  - Seed has a tough wing compared to most *Lomatium* species
Successes and Challenges of Large Quantities

- *Asclepias speciosa*
  - Timing of harvest
  - Generally good fill
  - Seed has a silky pappus
  - Pappus must be removed
  - Seed is fragile
Successes and Challenges of Large Quantities

• *Solidago canadensis*
  - Seed is very small
  - Has a late bloom window, affecting pollination and seed fill
  - Seed has pappus which must be removed
  - High amount of inerts
Successes and Challenges of Large Quantities

- *Plagiobotheris* spp.
  - Flowers occur along the length of the stem
  - Seed must be harvested before it dehisces
  - Seed is textured
  - Seed size is variable
## Seed Increase Yields

<table>
<thead>
<tr>
<th>Species</th>
<th>Small Collections</th>
<th>Seed Increase</th>
<th>Species</th>
<th>Small Collections</th>
<th>Seed Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSE</td>
<td>52.5%</td>
<td>60.3%</td>
<td>SOCA6</td>
<td>8.4%</td>
<td>29.6%</td>
</tr>
<tr>
<td>FECA</td>
<td>55.7%</td>
<td>65.1%</td>
<td>LOCO8</td>
<td>-</td>
<td>58.1%</td>
</tr>
<tr>
<td>ACLE8</td>
<td>48.2%</td>
<td>62.7%</td>
<td>ASSP</td>
<td>38.0%</td>
<td>36.4%</td>
</tr>
<tr>
<td>BRLA3</td>
<td>59.3%</td>
<td>30.5%</td>
<td>Plagiobothrys</td>
<td>18.4%</td>
<td>28.9%</td>
</tr>
<tr>
<td>DEEL</td>
<td>40.8%</td>
<td>66.9%</td>
<td>ERLA6</td>
<td>22.5%</td>
<td>12.5%</td>
</tr>
<tr>
<td>ACLE9</td>
<td>47.0%</td>
<td>30.8%</td>
<td>MOOD</td>
<td>5.6%</td>
<td>6.7%</td>
</tr>
<tr>
<td>BRCA5</td>
<td>88.5%</td>
<td>75.0%</td>
<td>ACMI2</td>
<td>10.1%</td>
<td>12.0%</td>
</tr>
</tbody>
</table>
Kayla Herriman
541.383.5481
kherriman@fs.fed.us

Sarah Garvin
541.383.5646
sarahegarvin@fs.fed.us

Bend Seed Extractory
63095 Deschutes Market Road
Bend, Oregon 97701
The preceding presentation was delivered at the

2017 National Native Seed Conference
Washington, D.C. February 13-16, 2017

This and additional presentations available at http://nativeseed.info