



Technical Note – January 2014

Native Boreal Shrub Seed Collection and Cleaning

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Introduction

Alberta's forest land reclamation criteria require the establishment of multi-strata vegetation that includes a shrub layer. Establishment of a shrub layer requires the acquisition of seed from a variety of native species specific to seed zones adjacent to or within the locale of the area to be reclaimed.

Because of the limited market for shrub seed in the past, these plants have been produced, for the most part, from seed that was hand-harvested from forest stands. Considerable efforts have been made in northeastern Alberta to collect shrub seed for reclaiming mined oilsand sites. Despite these efforts, there are still information gaps concerning the optimal methods for harvesting and extracting seeds from native shrub species.

This technical note provides information on the collection and cleaning of seeds from a number of native shrub species (blueberry, dogwood, bearberry, bunchberry, low-bush cranberry, buffaloberry, and wild rose). The methods described in this note can also be applied to other fruit-bearing boreal understory shrubs not listed above.

Field Collection

Native shrub seed collection can be labor-intensive as the fruits are usually picked by hand. Since several target species may co-occur and be ripe at the same time, it is often more efficient to collect multiple species in one location. Planter's bags are an effective means of carrying multiple pails, each pail containing the fruit of a different species.

- Re-vegetated disturbed areas, especially road ditches, and pipeline and power line right-of-ways are often good places to find plants such as blueberry, bunchberry, bog cranberry, low-bush cranberry and dogwood.
- Prior information on seed collection areas is the key to good productivity and efficient use of seed collecting labour. Potential seed collecting stands should be field-scouted prior to actual seed collection. This should be completed approximately 3-4 weeks before the fruits are ripe. Two to three scouting trips in a season would be adequate to assess potential seeds available for most native boreal species within a designated collection area. A June trip would be good for buffaloberry, blueberry and beaked hazelnut. An early August trip would cover most of the remaining berry and grass seeds.
- Fruit yield is heterogeneously distributed in the forest both in space and time. Therefore, collection location scouting is critical each and every year. Moreover, seed collection locations should not be over-picked. Therefore, it is good practice to alternate collection locations across multiple years. Three to four-person crews are ideal for the most effective coverage and increased collection volume. Actual collection sessions at a given location should be kept to approximately two hours. Mental and physical fatigue sets in after longer periods. Travelling to a number of collection locations throughout the day facilitates a break-up in this type of fatigue.



Seed Extraction

Two methods for seed extraction are described in this section. Method 1 primarily uses wet sieving and Method 2 is a variation on gold panning.

METHOD 1- wet/dry sieving

- Rinse berries in a strainer and remove debris (leaves and twigs).
- Gently crush fruit. Mash by hand with a small amount of water or with a potato masher. A food mill (for making tomato sauce) works well for low-bush cranberry. A blender can be used for small seeds (blueberry and bog cranberry) and hard seeds (rose); operate at very low speeds to avoid damage to seeds; blades should be blunted by taping them or grinding the edges off.
- Wet-sieve using basic soil sieves and by adding water from a spray nozzle. Refer to Table 1 for species-specific sieving procedures.
- Then transfer separated seeds to metal drying trays (baking sheets or fine-mesh drying racks are suitable) to air-dry. Periodically mix seeds to aid in the drying process and inhibit mold development.
- Once seeds are sufficiently dry they may still require further cleaning or separation if some debris is present.



METHOD 2- gold-panning technique

- Clean and crush fruit as in Method 1 (above).
- Pan seeds out of the fruit pulp. The principal behind this technique is to stratify the fruit mash in a water bath; this allows the lighter fruit pulp to be washed off the heavier seeds, which remain in the bottom of the pan.
 - Place fruit mash into a large bowl (wider and shallow works well) and fill with water.
 - From the first bowl, pour the fruit pulp floating on top into a second bowl.
 - Repeat these steps, alternating bowls and removing fruit pulp until seeds are satisfactorily cleaned.
- Air-dry and separate seeds as in Method 1 (above).



Table 1. Species-specific extraction details for Method 1.

	Buffaloberry (<i>Shepherdia canadensis</i>)	Low-bush cranberry (<i>Viburnum edule</i>)	Blueberry (<i>Vaccinium myrtilloides</i>), Bog cranberry (<i>V. vitis-idaea</i>)
(1) Fruit crushing	<ul style="list-style-type: none"> • Mash with small amount of water by hand or with potato masher. • Alternatively, a food mill may be used. • Do not use a blender as it tends to create too much foam. 	<ul style="list-style-type: none"> • Mash with small amount of water by hand or with potato masher. • Do not use a blender as it tends to damage seeds. 	<ul style="list-style-type: none"> • Mash with small amount of water by hand or with potato masher. • Add more water and blend with a hand mixer until fruit is broken apart. • A blender may also be used to crush fruit and release seeds. Operate at low speed and blunt blades.
(2) Sieves to stack	<ul style="list-style-type: none"> • # 5, 10 and 20 	<ul style="list-style-type: none"> • # 5 and 10 	<ul style="list-style-type: none"> • # 10, 20 and 40
(3) Rinsing and separation through sieves	<ul style="list-style-type: none"> • Place crushed fruit and seeds in #5 sieve (fill sieve no more than half full). • Spray mash in #5 sieve to push seeds through to #10 sieve. • Remove #5 sieve and set aside. • Spray #10 sieve to further clean fruit material from seeds collected in #10 sieve. • Most seeds should collect within this sieve but always check #20 as population seed size is likely to vary. 	<ul style="list-style-type: none"> • Place crushed fruit and seeds in #5 sieve (fill sieve no more than half full). • Spray mash in #5 sieve to push fruit debris and smaller seeds through to #10 sieve. • Most seeds collect in the #5 sieve. 	<ul style="list-style-type: none"> • Place crushed fruit and seeds in #10 sieve (fill sieve no more than half full). • Spray mash in #10 aggressively. • Remove #10 sieve and set aside. • Gently spray #20 sieve to push seeds into #40. Care is needed here to minimize the amount of debris that may also collect in #40
(4) Debris separation when dry	<ul style="list-style-type: none"> • In case where flesh still adheres to seeds, roll the seeds on garlic mats to remove dried flesh. • Use a column blower to separate lighter debris from heavier seeds. 	<ul style="list-style-type: none"> • Tumble the dry seeds and debris to break remaining fruit flesh off the seeds. • Use a column blower to separate lighter debris from heavier seeds. 	<ul style="list-style-type: none"> • Seeds will often be quite clean at this stage and will not require further separation.



Table 1 (cont.). Species-specific extraction details for Method 1.

	Red currant (<i>Ribes triste</i>), Bearberry (<i>Arctostaphylos uva-ursi</i>), Rose (<i>Rosa acicularis</i> , <i>R. woodsii</i>)	Bunchberry (<i>Cornus canadensis</i>)
(1) Fruit crushing	<ul style="list-style-type: none"> • Mash with small amount of water by hand or with potato masher. A hand mixer can also aid in breaking up fruit. • <i>Ribes</i> and <i>Rosa</i>: fruit may also be blended on a very low speed setting, however watch closely to ensure seeds are not damaged. 	<ul style="list-style-type: none"> • Blend fruit on low-speed setting. Watch closely to ensure seeds are not being damaged. • Be thorough as flesh adheres firmly to seeds. • Alternatively, a food mill be used to crush fruit.
(2) Sieves to stack	<ul style="list-style-type: none"> • # 5, 10 and 20 	<ul style="list-style-type: none"> • # 5, 10 and 18 (or 20) • #18 works better as it clogs up less frequently.
(3) Rinsing and separation through sieves	<ul style="list-style-type: none"> • Place crushed fruit and seeds in #5 sieve (fill sieve no more than half full). • Spray mash in #5 sieve to push seeds through to #10 sieve. • Remove #5 sieve and set aside. • Spray #10 sieve to further clean fruit material from seeds collected in #10 sieve. • Remove #10 sieve and set aside • Spray #20 sieve to further clean fruit material from seeds collected in this sieve. • Remove seeds from both #10 and #20 sieve to sheets for drying. 	<ul style="list-style-type: none"> • Place crushed fruit and seeds in #5 sieve (fill sieve no more than half full). • Spray mash in #5 sieve and set aside. • Spray #10 sieve and set aside. • Spray #18 sieve. • Combine seeds and debris from #10 and #18 sieves and repeat blending process (step 1 above). • Repeat steps (2) and (3).
(4) Debris separation when dry	<ul style="list-style-type: none"> • Tumble the dry seeds and debris to break remaining fruit flesh off the seeds. • Use a column blower to separate lighter debris from heavier seeds. 	<ul style="list-style-type: none"> • Tumble the dry seeds and debris to break remaining fruit flesh off the seeds. • Utilize a column blower to separate lighter debris from heavier seeds. • In case where flesh still adheres to seeds, roll the seeds on garlic mats to remove dried flesh.