

Shepherdia canadensis

COMMON NAMES: Soapberry, Canada Buffaloberry

FAMILY: Elaeagnaceae (Oleaster)

SPECIES IDENTIFICATION

GENERAL ID

Buffaloberry is a perennial, herbaceous shrub that is typically 0.5 to 3 m tall.¹ Young branches are brown with fine rust-coloured scales; mature branches are greyish. Berries grow in bunches at the base of branch off-shoots.



Mature shrub

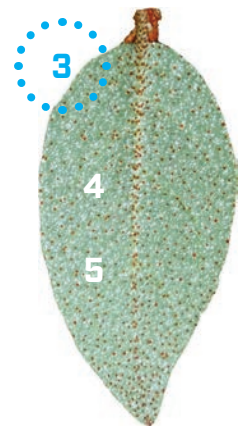
UPPER SIDE

- 1 Finely haired
- 2 Dark green



UNDER SIDE

- 3 Smooth margins
- 4 Silver
- 5 Small 'rust' scales



LEAVES

Leaves opposite, typically 2.5 to 5 cm long with an elliptical to oval shape and smooth margins.¹ Upper side of leaf is dark green with fine tufts of hair. Look for conspicuous rust-coloured scales on silvery underside of leaf.

HABITAT

Buffaloberry is widespread and often found in open forests, riverbanks, shores, and dry slopes. It can be found along riparian areas and valleys in dense stands. As this shrub has the ability to fix nitrogen, it can thrive in coarse-textured, nutrient-poor soils.² This species is typically shade intolerant.³ Buffaloberry has high fruit production when found in areas exposed to full sun and is a successional species in communities following wildfire.⁴ Associated species include *Populus tremuloides*, *Rosa acicularis* and *R. woodsii*, *Viburnum edule*, and *Alnus viridis*.

LOOKS LIKE

- *Shepherdia agentea* (Thorny Buffaloberry) - branches have spines. Young twigs and older bark a silvery shade.⁵

FLOWERING

This species is dioecious. Small flowers are yellowish brown and 4 mm wide, appearing in April through early May before leaf flush.⁶

FRUIT AND SEED

Fruit is a juicy, bright red berry when ripe, 3-6 mm long and oval to spherical in shape. Skin is translucent with small pores or scales throughout. Fruit ripens during June and remains on the shrub for an extended period.⁶ Seed is a flattened oval shape, partly and unevenly bivalved.



Early fruit development



Various stages of fruit development.
Mature berry is deep red.



Cleaned Buffaloberry seed

SEED COLLECTION AND PROCESSING

SCOUTING

Scouting for Buffaloberry should be conducted in early June. It is suggested to scout early in the season, use GPS to track the location of the patch, and flag shrubs to improve efficiency when seed is ready for collection.

SEED COLLECTING

Harvest berries June to July. The ripe berries will be dark red and will easily fall off the branch when it is stroked from base to tip. Hold a medium to large-sized plastic pale under the branch and stroke the branch with a downwards motion and light pressure. Empty the pales regularly and place berries in plastic freezer bags for storage in a cooler with ice packs while collection continues. It is crucial that the berries be kept cool to preserve the seed viability. Alternatively, branches may be cut and placed in a cooler for picking at a seed collection facility.

INTERIM STORAGE

After collection, berries can be stored in a 4°C cooler or fridge for up to one week before seed processing. It is recommended that berries be picked as soon as possible from harvested branches.



Cooler method for transporting



- 1 Food processor with taped blades
- 2 Discard buckets
- 3 Large bowls
- 4 Jelly bags
- 5 Various size sieves

BERRY PROCESSING

Place a couple of handfuls of the collected berries in a jelly bag, and squeeze the juice out into a bucket. This will reduce the foaming and soaping up of berry juices during the blending process. After jelly bag processing, use a food processor to break down the fruit flesh. The processor's blades must be taped with a few layers of Tuck Tape or similar material to dull them and prevent harm to the seeds. Fill the food processor approximately half full with squeezed berries, along with a splash of water. Blend on low to medium power for a few minutes, then rinse the blended matter into a sieve. Cover with a second sieve and rinse the blended material (through the top sieve) to further rinse out remaining juices.



Juice removal with a jelly bag



'Foaming up' of fruit after blending process



Pulp removal using pour-off method



1 Viable seed remains
2 Pulp and water removed



SEED EXTRACTION

Place rinsed pulp and seed into a large bowl and fill with cold water. Let sit for a minute, allowing pulp and unripe seeds to float to the surface while viable seeds sink to bottom of the bowl. Carefully 'pour-off' the water into an empty bowl, letting the floating contents empty with the water, while viable seeds remain at bottom of the first bowl. Repeat this process 2-4 times until the water is clear and mostly seed remains at the bottom of the bowl. Place the seeds into a sieve while the rest of the berries are processed, allowing the excess water to drain.

INTERIM DRYING AND FINAL PROCESSING

Place drained, extracted seeds on an inclined baking sheet and spread in an even layer, no more than one seed thick to maintain good air flow and allow the seeds to dry. Once they are dry to the touch and the seed coat can be rubbed off when rolled between fingers, the seed is ready for final processing. If located in a humid area, the use of desiccant or a dry room/chamber may be necessary. Place a handful of the seed into a dry jelly bag. Roll and crush the bag around in your hands or on a hard surface to loosen and break down the seed coat. When most seeds have their seed coat rubbed off, use a column blower to separate the chaff from the cleaned seed. Perform a final sieve to remove any remaining chaff. Seeds will be shiny and smooth in texture.



Drying of seeds with water collection at base of tray



Jelly bag process for seed coat removal

STORAGE

Dry cleaned seeds to 15-25% Equilibrium Related Humidity (% ERH) at 20-30°C or 4-8% moisture content and store in an airtight container or sealable bag at -20°C for best seed longevity. Depending on the local climate (relative humidity in particular), final drying may be possible on a bench top. If located in a humid area, the use of desiccant or a dry room/chamber may again be necessary.



For more information on best practices for collection and seed registration, refer to “Technical Note #15: Seed Collection, Processing and Storage” by the Centre for Boreal Research, NAIT.

REFERENCES

1. Johnson D, L Kershaw, A Mackinnon, J Pojar. 1995. Plants of the Western Boreal Forest. Lone Pine Publishing: Edmonton, AB
2. Rhoades C, D Binkley, H Oskarsson, R Stottlemeyer. 2015. Soil nitrogen accretion along a floodplain terrace chronosequence in northwest Alaska: Influence of the nitrogen-fixing shrub *Shepherdia canadensis*. *Ecoscience*. Vol 15, 2: pp. 223-230.
3. Humbert L, D Gagnon, D Kneeshaw, C Messier. 2007. A shade tolerance index for common understory species of northeastern North America. *Ecological Indicators*. Vol 7, 1: pp. 195-207.
4. Hamer D. 1996. Buffaloberry [*Shepherdia canadensis* (L.) Nutt.] fruit production in fire-successional bear feeding sites. *Journal of Range Management* Vol 49, 6: pp. 520-529.
5. Moss EH. 1983. *Flora of Alberta*. 2nd ed. Revised by Packer JG. University of Toronto Press.
6. Johnson KM, SE Nielsen. 2014. Demographic effects on fruit set in the dioecious shrub Canada buffaloberry (*Shepherdia canadensis*). *PeerJ* 2:e526 <https://doi.org/10.7717/peerj.526>

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