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Harvesting Stem Cuttings for Riparian Planting

The following factsheet describes what stem cuttings are and how to harvest and store them for planting.

What are stem cuttings?

Stem cuttings are segments of matured, dormant, woody stems or shoots with intact lateral buds (Darris 2006, Figure 1). Stem cuttings of certain species of trees and shrubs will grow into new individuals (Figure 2), if harvested, stored and planted appropriately. Although harvesting stem cuttings is relatively labour intensive, with a team of volunteers it can be an inexpensive and enjoyable way to acquire stock for a planting project.

Figure 1. Recently harvested willow stem cuttings.

Selecting Stem Cuttings

In Alberta, the best species to select stem cuttings from are willow (*Salix spp.*), red osier dogwood (*Cornus sericea*), plains cottonwood (*Populus deltoides*), and balsam poplar (*Populus balsamifera*), as these will root with the highest rates of success when planted[1] (Darris, 2002; Hoag 2007).

The minimum recommended diameter for stem cuttings is 2cm. Stem cutting lengths are typically around 1m, but may range from 0.4-2.5m, depending on the site. Consider the following factors when deciding on cutting length:

1. **Depth of water table**. Cuttings should be long enough to reach the water table when planted, so longer cuttings are often used in more upland areas (i.e. the bank and terrace zones)
2. **Height of surrounding vegetation**. The tops of cuttings should not be shaded out by surrounding vegetation when planted
3. **Height of high water level**. The tops of cuttings should be above the annual high water level when planted
4. **Desired speed of establishment**. Longer cuttings will provide more rapid bank stabilization and erosion control

[1] Common snowberry (*Symphoricarpos albus*), currants (*Ribes spp.)* and red elderberry (*Sambucus racemosa*) may also root with moderate success when field planted in favourable conditions (Darris, 2002).

When considering these factors, keep in mind that ideally at least ¾ of the cutting should be in the ground when planted, while 3-4 buds should be aboveground (Hoag, 2007).

Furthermore, it is important to take cuttings from healthy stem material**,** avoiding stems that are rigid or easily breakable, abnormally light, or are covered in lichen. Scratching away a bit of bark from the stem can reveal whether the stem wood is green and thus alive (Figure 3). Also avoid using the tips of stems for cuttings, as these have relatively low energy reserves (Hoag, 2007).

Figure 2. Species such as willow can grow from stem cuttings.

Harvest Timing

The best time to harvest stem cuttings is during the winter "dormant season" – that is, when the "donor" plants are without green leaves. Stem cuttings harvested during this time transpire less water and consequently are less likely to dry out. Harvesting stem cuttings from actively growing donor plants in the spring or summer is possible, provided the cuttings are planted within 1-3 days with their rooting ends soaking for that period.

Harvest Preparation

Select a harvesting site that has a healthy stand of the desired species, is close to your planting site, and can be legally accessed (contact Alberta Environment and Parks before harvesting cuttings from public land, http://aep.alberta.ca/).

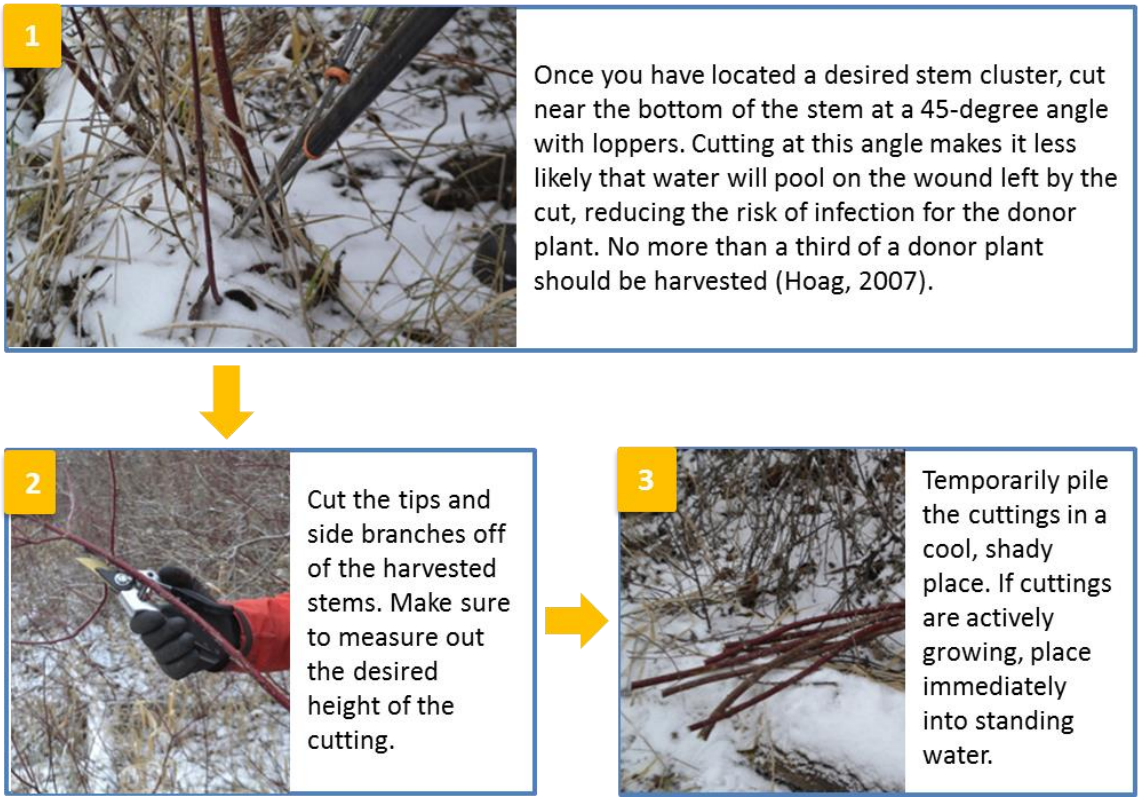
Ensure that you have the necessary Personal Protective Equipment, which should include gloves, rubber boots or at least closed toe shoes, eye protection and a hat. The latter two items help to protect the eyes and face from scratches as you navigate through the stand.

The following tools are also recommended:

- Loppers;
- Hand pruners or a machete;
- Commercial stretch-wrap, bale twine, or large zip ties to tie bundles of cuttings together;
- Flagging tape and a sharpie pen for marking down species and site information;
- Brush and a 10% bleach solution for cleaning off cutting tools prior to harvesting. This prevents cross-contamination of plant diseases;
- If cuttings are actively growing and there is no standing water on site, 5 gallon buckets filled with water may be used for soaking.

Figure 3. Scratching away the bark of this willow stem reveals green underneath, indicating that the stem is alive.

Harvesting



Storing

Actively growing cuttings may be planted up to 3 days after harvest, as long as their rooting ends are kept soaking in water. Dormant cuttings can be stored for far longer – up to 6 months under the right conditions (Crowder, 2005).

To store dormant cuttings, wrap them into manageable bundles using bale twine, zip ties or stretch wrap. For future reference, it is advisable to mark each bundle with flagging tape, and record the species and harvesting date and location.

Figure 4. Snow caches such as this one are an easy way to store cuttings until planting.

Bundles of dormant stock must be placed in cold storage (between -5 and 4°C; colder is preferred[2]) or a "snow cache" over winter (Tilley and John, 2012). Snow caches should be located in fairly shaded areas where cuttings can be evenly buried with at least two feet of snow (Figure 4). Covering snow caches with reflective insulated tarps helps maintain cool temperatures.

When the soil is thawed and ready for planting, remove cuttings from cold storage and soak them in water for two to six days (Sotir and Fischenich 2007; Darris 2006). Plant cuttings directly after they have finished soaking.

For more information on harvesting stem cuttings, please contact:

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[2] Note that dormant cutings can only be stored for 2-3 months if temperatures are above freezing (i.e. 0-4°C) (Tilley and John, 2012).

References

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All photos were taken by AWES.