

Planting Stem Cuttings in Riparian Sites

Stem cuttings are mature, dormant segments of woody plants that can grow into new individuals and are commonly used in riparian restoration projects to stabilize banks, absorb sediments and nutrients, slow down floodwater, enhance wildlife habitat, and provide other functions. Successfully establishing stem cuttings requires proper methods of planting, which are described in this article. Note that proper harvesting, storage, and site preparation methods also contribute to stem cutting success and are described in AWES' *Manual for Riparian Forest Buffer Establishment in Alberta*.

Selecting stem cuttings

Willow (*Salix spp.*), red osier dogwood (*Cornus sericea*), plains cottonwood (*Populus deltoides*), and balsam poplar (*Populus balsamifera*), establish most effectively from planted stem cuttings. Cuttings may range in length from 0.4m to 2.5m, should be alive, disease free, and completely soaked for 2-6 days prior to planting.

When to plant?

Stem cuttings establish with the greatest success when planted after soil thaws but before leaf bud-out (mid-April to mid-May). Planting can also occur later in the growing season or the fall, but with reduced success. Whatever the season, avoid planting on days that are windy, dry, or warmer than 30°C. Instead, plant when soil conditions are favourable – that is, drained of any standing water, thawed, and moist.

Where to plant?

Plant into moist soils on the banks of streams, rivers, lakes, wetlands, and other water bodies. All the species listed above can tolerate temporary seasonal flooding. Avoid planting in areas with high grass or weed competition, on slopes greater than 1:1 (vertical to horizontal), or on sites with high levels of compaction.

Tools

Depending on the technique you choose, you may need a rubber mallet, a piece of rebar, an auger, or a shovel.



Figure 1. Planting a willow stem cutting into relatively loose soil. Photo by AWES.

Technique

Stem cuttings should be planted **right-side up**, to a depth where their bottom can reach the water table and their aboveground portion has at least 3 buds that are not overly shaded by surrounding vegetation. Ideally, at least $\frac{3}{4}$ of the cutting should be buried underground. Planting cuttings to this depth can be challenging, and different techniques are required for different soil conditions:

- In loose soils, it may be possible to push cuttings into the ground by hand (Figure 1).
- In more compact soils, cuttings can be pounded into the ground using a rubber mallet. Avoid pounding too hard, as this will damage the cutting's rooting end as it is forced in. If the pounding damages the top of the cutting, simply cut away the damage with a pair of pruners.
- In moderately compact soils or with relatively thin cuttings, a pilot hole can be made by pounding in a piece of rebar or by using an auger. The cutting can then slide into the hole relatively easily.
- An alternative, slightly more time-consuming option is to dig holes with a shovel. When filling in the holes, ensure that the soil is tightly packed around the cutting.

Maintenance

If planted at the beginning of the growing season, cuttings should produce leaves within 1-2 months. Monitor regularly, particularly during droughts or after flooding events. Survival rates will improve if, for at least the first couple of years, cuttings are protected from livestock and wildlife (e.g. beaver, deer, vole, etc.), irrigated during dry periods, and weeded regularly.

For more information on planting stem cuttings, please contact us at:



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Useful References

- Darris, D.C. 2006. Suggestions for installing hardwood cuttings (slips, whips, live stakes, poles, posts) and live fascines (Pacific Northwest region, west of Cascades). Plant Materials No. 38. Portland, OR: USDA-Natural Resources Conservation Service.
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- Sotir, R.B., and C. Fischenich. 2007. Live stake and joint planting for streambank erosion control. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-35). Vicksburg, MS: US Army Engineer Research and Development Center.
- Tannas, S., and E. Tannas. 2016. *City of Calgary: Assessment of Vegetation Establishment on Bio-engineering Project. Interim Monitoring Report Cuttings, Live Plants, and Seed*. Cremona, AB: Tannas Conservation Services Ltd.
- Wonneck, L., Zeran, S., Renton, J., and Peterson, K. 2017. *Manual for Riparian Forest Buffer Establishment in Alberta*. Agroforestry and Woodlot Extension Society, <http://www.awes-ab.ca/>.