Comprehensive Tree Planting

South Dakota Department of Agriculture and Natural Resources (DANR)

Urban and Community Forestry

Summary:

Urban and Community Forestry is beneficial to our local communities. This guide will educate on the proper tree planting procedures that will give the tree a higher likelihood of survival in its formative stage. While discussing proper techniques this guide will also talk about common mistakes that happen during planting. This comprehensive tree planting guide gets its steps from the American National Standard Institute (ANSI) A300 standard for container-grown, ball-and-burlap (B&B), and bare-root stock.

Step One: Plant Inspection

Condition:

- 1.25—2 inch caliper stock

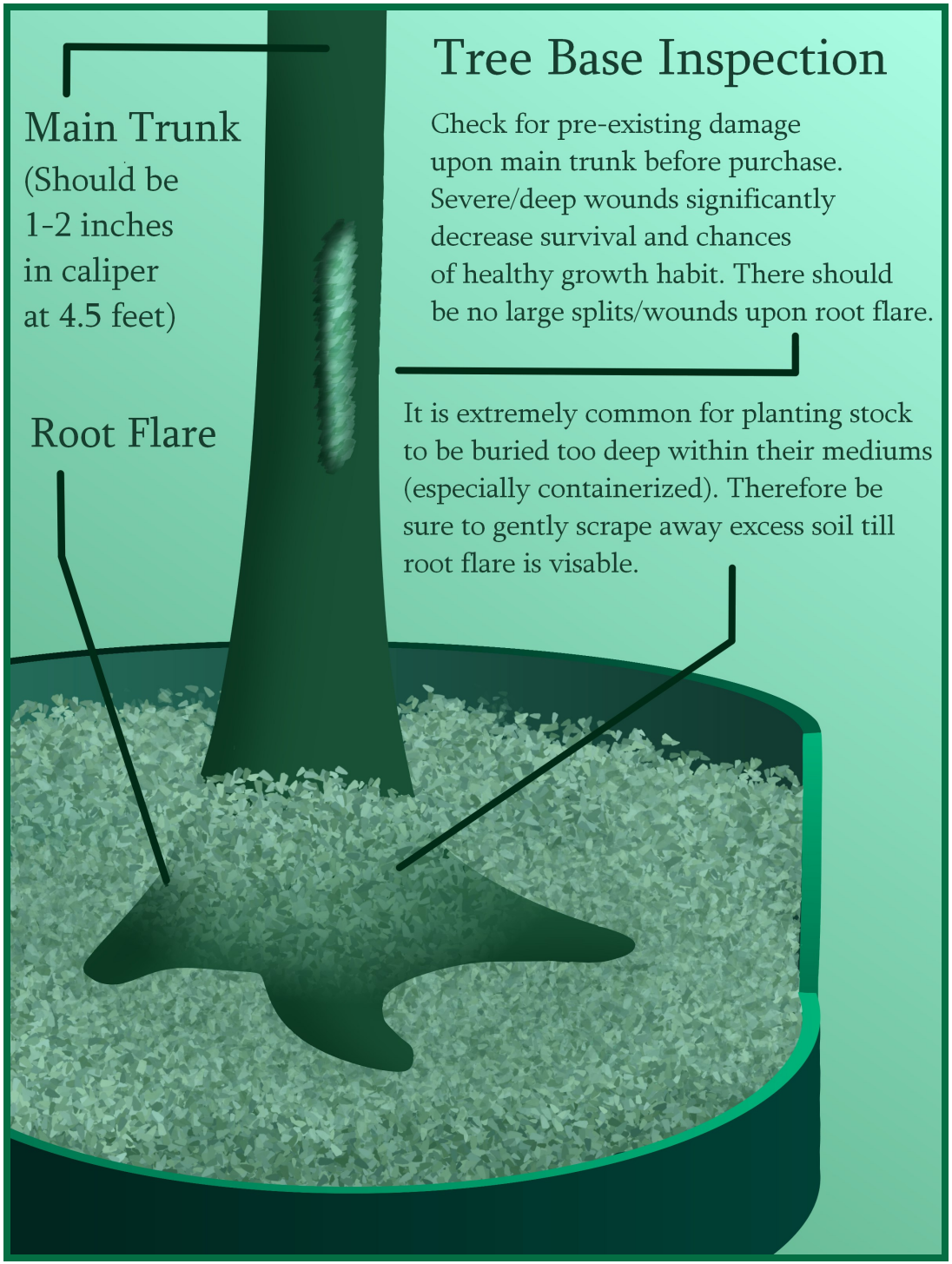
Inspection of tree

- No identifiable damage to main stem
- No identifiable damage to root collar

Types of Stock:

Bare-root Containerized Ball and Burlap

The tree can be planted in the container too deep when you acquire it, so you will need to find the root flare. Gently scrape away the soil on top of the root ball until the first root is visible.



Step Two: Digging the Hole

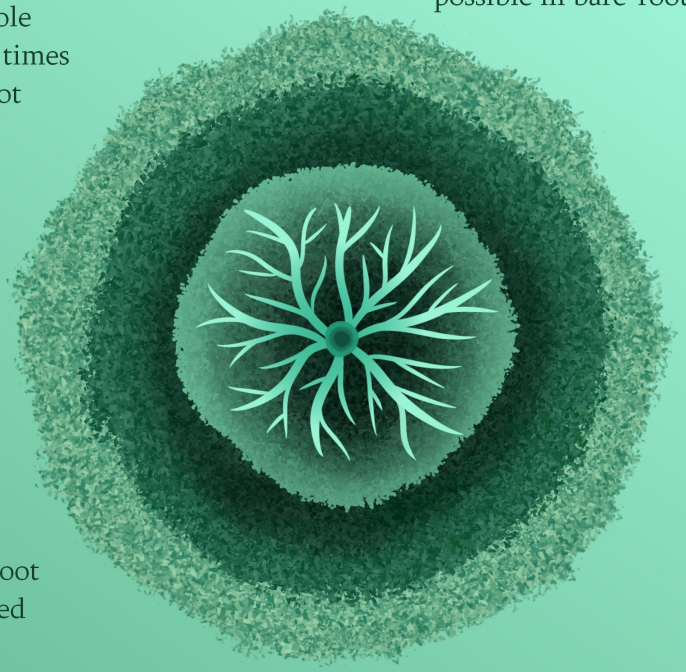
Planting Hole/Watering

- The hole should be saucer shaped, having the walls slope towards the base of the root ball. The hole should be 2-3 times the diameter of their root ball/mass. The hole should be just as deep as the bottom of the root ball up to the root flare: no deeper, no shallower.
- The walls of the planting hole should not be compacted/ smooth, this is called glazing and can restrict root growth and development. Notching and breaking up the walls will help the roots spread outside the hole.
- Unless specified by a professional, only put unamended soil back into the planting hole. Filling the hole with a different soil can cause drainage issues and result in a perched water table, potentially drowning the tree.
- Unless specified by a professional, do not add any compost or fertilizer to the hole
- Form a ring of mulch around the freshly planted tree, then “mud-in” the tree with 3 gallons per inch of diameter the tree has.
- For the first 2 weeks of planting in South Dakota east of the river, ensure that the tree is watered at least 3 times a week. Between 2 weeks and 2 months a tree will need to be watered twice a week. By two months a weekly watering should be sufficient till established, barring drought or extreme heat. West river plantings should be a day more frequent than plantings east river.

Planting and Watering

Do not compress roots if possible in bare-root tree plantings.

Ensure that hole is at least two times wider than root mass/ball, but no deeper.

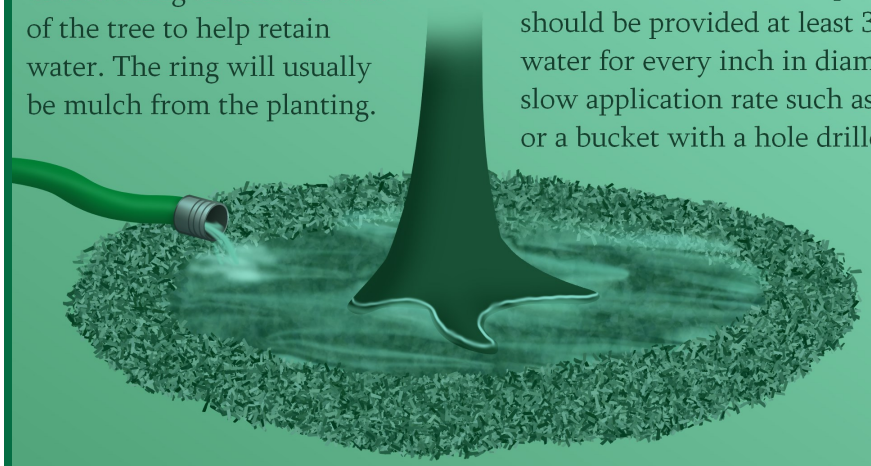


Ensure that root flare is exposed

When filling back the hole around the root ball, use the EXACT soil that was dug up for the planting. This is to ensure no soil texture differences remain, which can result in undesirable moisture or root behavior.

Create a ring around the base of the tree to help retain water. The ring will usually be mulch from the planting.

In the first two weeks of planting, a tree should be provided at least 3 gallons of water for every inch in diameter, with a slow application rate such as a tree bag or a bucket with a hole drilled at the base.



Step Three: Know Your Stock

Container - Grown Stock:

- Remove plant and root ball from the container

Do NOT pull on the trunk to remove plant.

Lay on side and either slowly wiggle out the root ball or cut open the container.

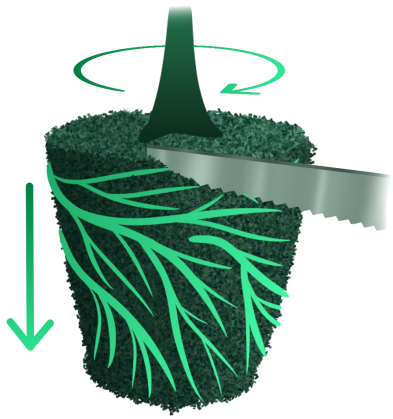
- Container root balls will often be in the early stages of girdling but can be manipulated back to normal.

Remove one inch of the outside root ball, by cutting down all around the root ball with a sharp shovel, soil knife, or saw.

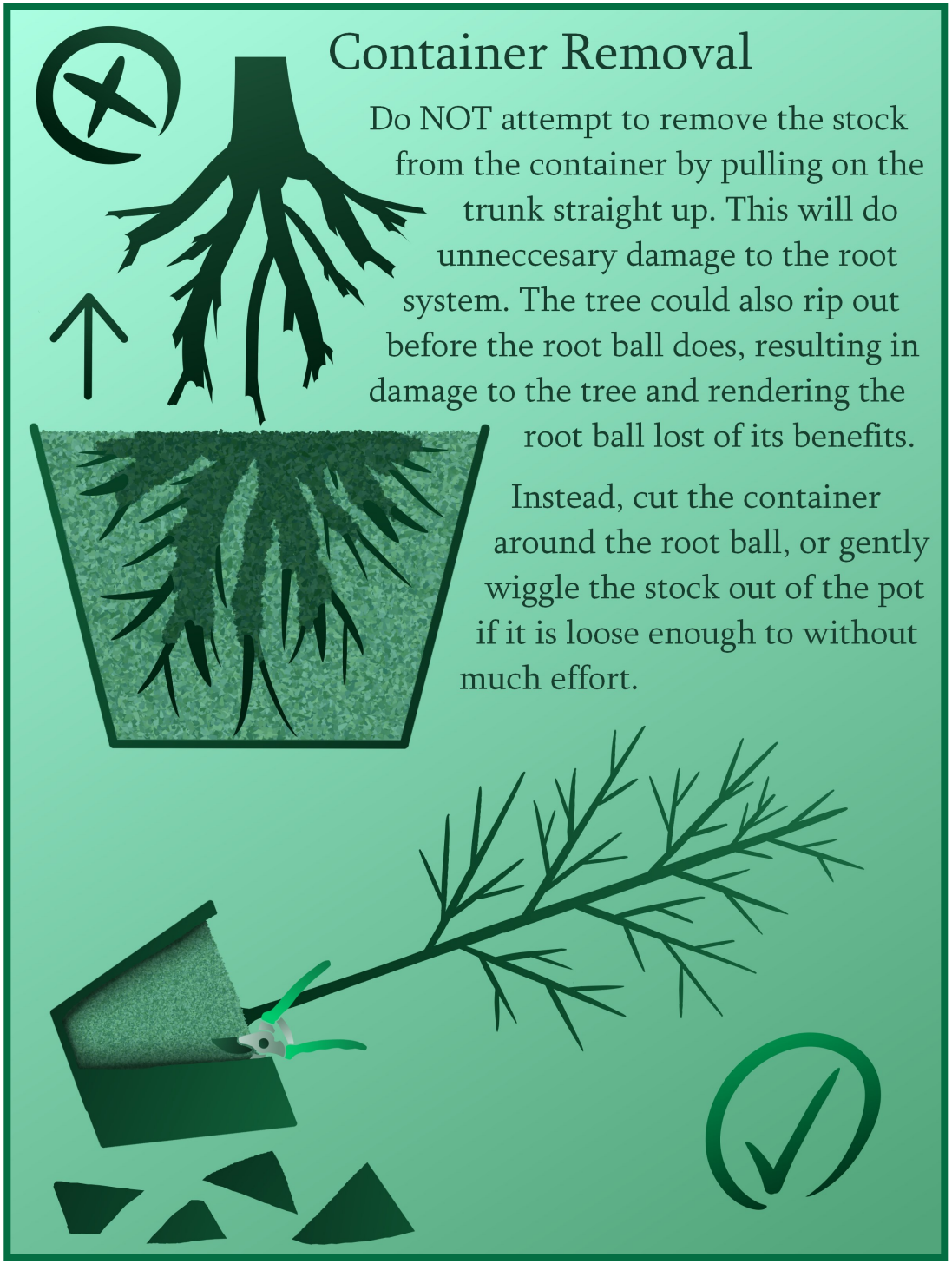
The roots should be pointing out from the trunk.

You may feel this is significantly damaging the tree,

but cutting the root ball will get rid of circling roots, which could girdle the tree later in life.

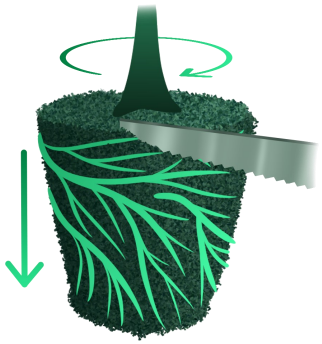


Cut down and around by one inch to sever potential girdling roots. Tearing the roots into a more natural formation also works, but requires you to be thorough.



Ball and Burlap:

- Remove metal wire outside the burlap sack.
- Place the plant in the hole, then remove any twine and the burlap sack. Keeping the sack until it is in the hole can help keep its structure.
- Failing to remove either wire or burlap can cause root girdling and moisture issues.
- Like containerized stock, ball and burlap stock should have the first inch around the root ball cut to ensure there is no circling roots.



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Bare-Root Stock

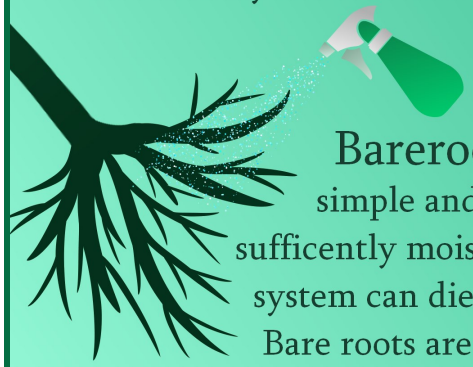
- Bare-root stock can be a difficult method of tree planting and needs to be done in proper conditions due to temperature sensitivities.
- Bare roots can dry out quickly, therefore must be kept in a moisture-retaining medium, such as moist woodchips/hay, till planting.

Tree Base Prep (by stock type)

Ball and Burlap: Ensure that all wire and burlap is removed from the root ball before planting, even if the burlap is labled as "bio-degradable". This is to make sure that the roots are not obstructed as they grow.

Container / Ball and Burlap:

It is very common for ball-based stock to have roots circling the outside confines of the ball. This can result in the growth of stem girdling roots which can severly reduce the lifespan of the tree. Therefore be sure to tear the roots into a more natural form. This may feel as though your are harming the tree but a cut root is better than a circling root as the tree will naturally recover over time provided sufficent care.



Bareroot: Although bare root plantings are simple and convenient, the roots MUST remain sufficently moist at all times before planting as the root system can die within mere minutes of drying out. Bare roots are also limited to spring and fall plantings as hot summer days make survival of the tree unlikely.

Step Four: Backfilling

- Create a berm/ring on the top of the hole around the root ball, about 3 inches tall and 3 inches wide.
- Put the root ball in the hole so that the first root flare is just above the brink of the hole.
- Do NOT put any soil that was not originally excavated from the hole, as this can result in water retention/behavior issues.
- Break up any soil lumps larger than the palm of your hand.
- Do NOT stomp the soil to pack it down over the planting. Doing so destroys beneficial pores in the soil that the tree needs for oxygen and root growth. Instead firm up soil with watering. This is known as “mudding in” and gently secures the tree in the hole without compressing pores.
- Add a ring basin of raised soil or mulch around the edge of the hole, as it aids in water retention.
- Keep the phrase “Create a Donut, not a volcano” in mind as you apply your mulch. Mulch or soil that is piled against the trunk of the tree makes the tree vulnerable to all sorts of diseases, animals, insects and decay.

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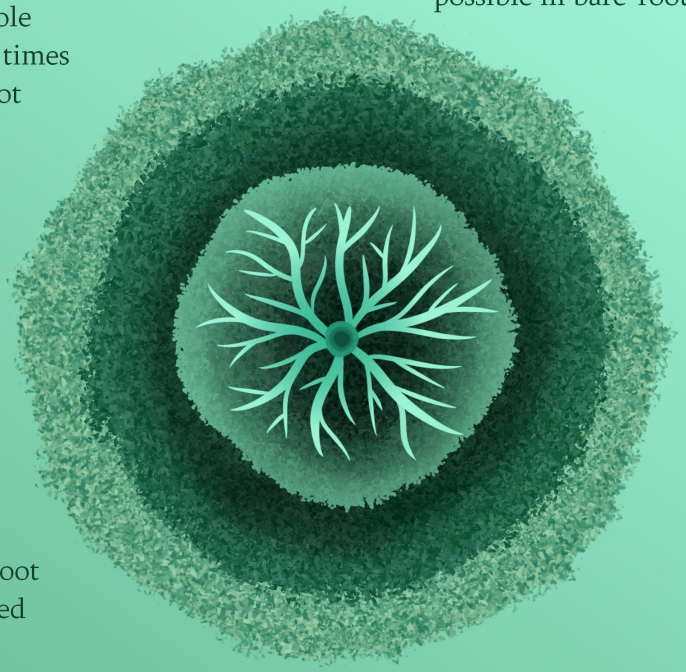

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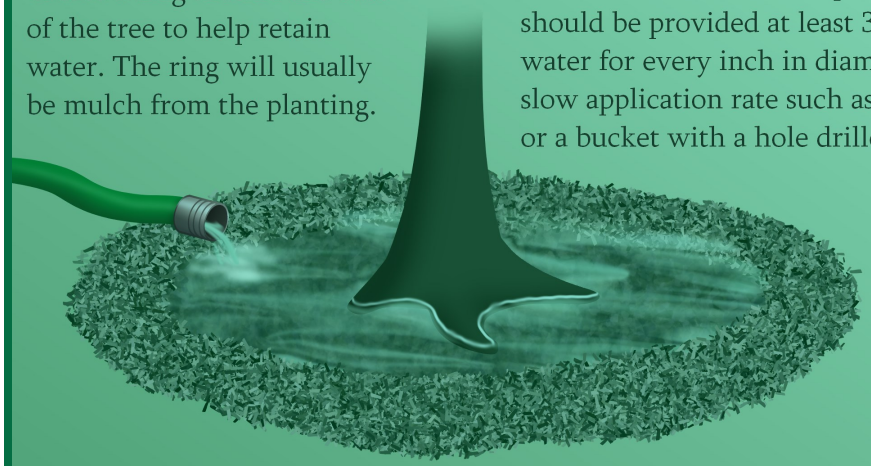


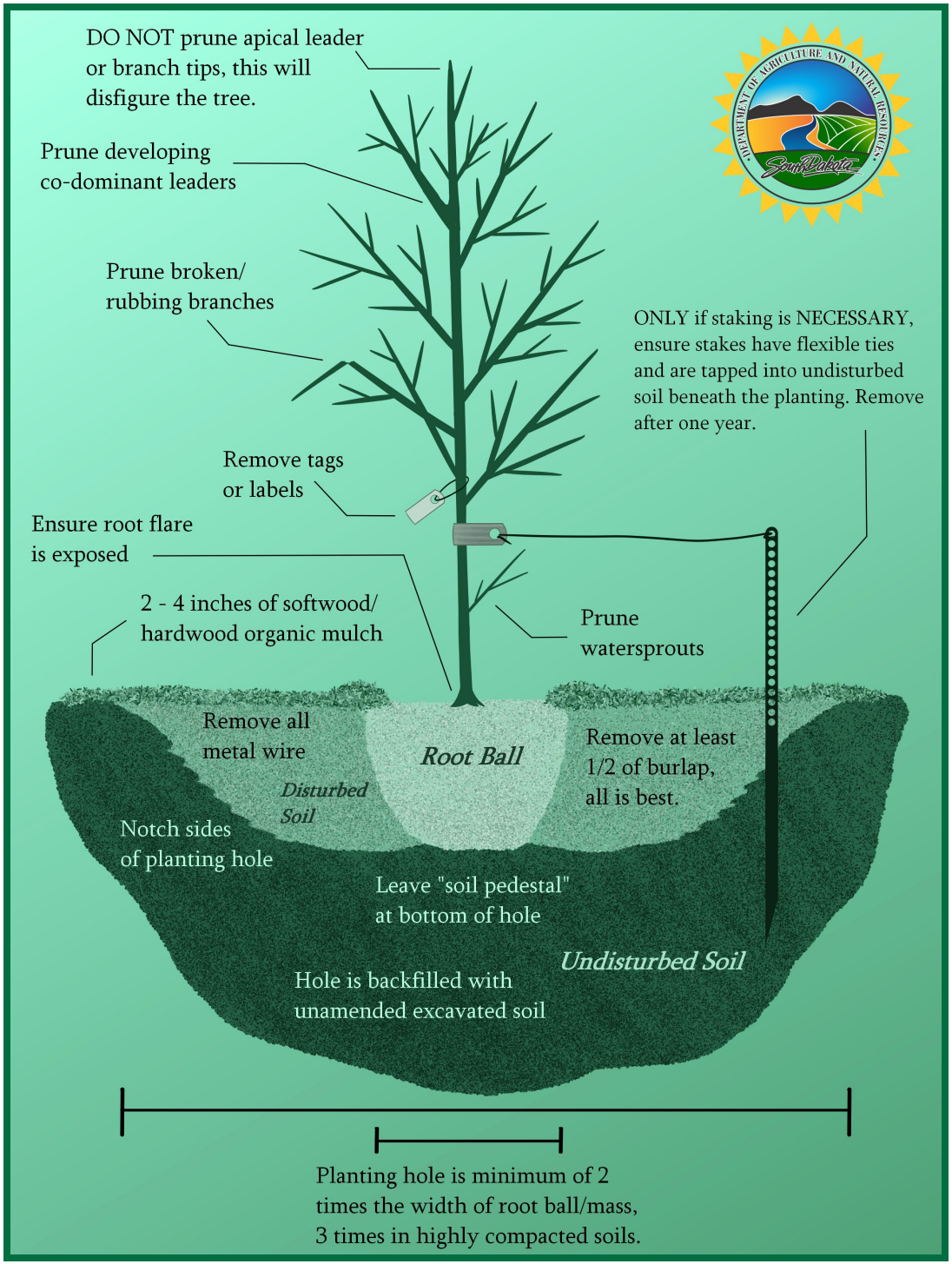
Step Five: Mulching

Mulching is incredibly beneficial for tree plantings. Mulch improves water retention in the soil, regulates ambient temperature around the tree, reduces weed growth, and as the mulch breaks down it will add nutrients back into the soil for the tree.

Apply 2- 4 inches of organic mulch over the disturbed soil, but the mulch should be bowled around the trunk a few inches, so it does not touch the trunk.

Mulch should be replaced annually for the first few years of a tree's life, as the mulch will break down/blow away over time.

Although there are other materials that people use at the base of their tree such as cardboard and stones, mulch is easily the best material to use for tree plantings as the others often have poor moisture control or don't let gasses and water permeate into the soil around the tree.



Step Six: Staking and Aftercare

Staking is not always a necessary addition to a planting, but South Dakota experiences strong, persistent winds that can damage or deform young trees. Staking is a simple process that can reduce issues with wind.

- Set 2 stakes in undug soil on the windward and leeward sides outside the hole.
- Use a broad piece of cloth or canvas at the end of an attachment wire, with the wire protected by a soft covering such as a hose. The point of attachment to the tree should only be tight enough to help support but not hinder movement of the tree in wind. This provides support while the tree develops its roots to acquire the ability to support itself.

Watering

Watering can be a commonly misunderstood part of new tree plantings. Watering is a required action to keep the tree alive after planting. If the tree does not get water, it WILL die.

In the first 2 weeks after the tree planting, the tree should be watered at least 3 gallons of water per inch of caliper at 4.5 feet, with preferably a slow-release method. This could be as simple a bucket with a hole punched at the bottom. Water your trees more in times of drought/high temperatures.