



Training Guide: UPDATED 11/2019

Tree Care & The Science of Planting Trees

SETTING UP

Materials needed:

- This Training Guide
- PowerPoint: "CMG Training Class Review_Tree Planting and Tree Care_2020"
- Printed Challenges (using PDF of PowerPoint) for small group work

ACTIVITY:

TREE PLANTING & CARE CHALLENGES

Time: 45 minutes

1. Load PowerPoint and have challenges ready for handing out.
2. Have students team up in small groups.
3. Hand out Challenges, one per group and give them 5-8 minutes to discuss and answer questions.
4. Bring class back together and have groups share #1-8 in order. Utilize the PowerPoint to help groups describe/share their challenge.
5. Offer suggestions/clarifications based on the answers in this guide.
6. If there are not 8 groups, the facilitator/coordinator can share the remaining challenges

 Team up in small groups and pick a challenge.	 Discuss the challenge and determine potential response as a CMG.	 Share with the class Challenges #1-8 as time allows.
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CHALLENGE 1: **The Case of the Over-Achiever**



What is wrong with this picture?

Can the problems be fixed?

- Customer used **landscape fabric under mulch** which is not recommended
 - Problems with Landscape fabric:
 - Doesn't have a lot of-pore space
 - Pores can clog within 3 years of installation
 - Can hold excessive moisture and either force roots to move closer to the surface (and then scald them because of the heat underneath the landscape fabric)
 - Can prevent water and oxygen getting to the roots, starving the roots of oxygen and water
 - The landscape fabric appears to be girdling the tree trunk
- **How is this tree getting irrigated?**
 - The drip spaghetti tubing is wrapped around the trunk which can lead to girdling. The drip (water source) needs to be moved out further as the tree grows to adequately water the tree.
- **Is the rock mulch effective given that it was placed over the landscape fabric?**
 - Rock mulch (or any mulch) needs to be placed outside of the original root ball.
 - Rock mulch doesn't add organic matter to the soil
 - Rock mulch can be very hot
 - Weeds are still a problem in rock mulch
 - Wood mulch is the best choice, if the health of the tree is the overall goal

Additional question for class: How can this situation be remedied? Answers:

- Remove the landscape fabric
- Replace the rock mulch, keeping it at least 6-12" away from the trunk
- Unwrap the drip line, move emitters to tree's dripline; increase emitter number

CHALLENGE 2: The Case of "What-were-you-thinking?" Property Owner/Builder

The planting space for this tree is about 2x3 feet. It is in an alley between two apartment buildings.

- What are the challenges of planting a tree in this location?
- How does this location impact tree care & future growth?



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The major problem with this serviceberry was poor siting. (Note: It is not a bad tree choice in terms of mature size (4-25' Ht. x 4-15' width) BUT challenges include:

- **Where will the branches extend?**
 - Serviceberry can have a more horizontal growth form, and there will not be enough space. They could grow long enough to the left to scratch the vehicle that goes in and out of the garage.
- **What is the water supply?**
 - As the roots expand outward, will they be able to extract enough water?
 - What will happen to the roots when they reach the garage wall? (The branches are likely grow parallel to wall at first, then turn back)
- **How will the hardscapes and mulch impact the tree?**
 - There will be a lot of heat reflected onto this plant from the driveway, garage and alley.
 - The rock mulch is a poor selection for tree health but was probably chosen to keep wind from blowing it around or thought it would hold in water.
- **How can this tree reasonably be fertilized as it matures?**

CHALLENGE 3: The Case of The Off-Color Maple

- What could be contributing to this tree's decline?
- What could be causing the leaves to be chlorotic?
- Think about what you can see as well as what you can't.



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The tree has symptoms of iron chlorosis (which can be caused by many issues, such as soil compaction, soil pH, salty soils, too wet or too dry soil, cool soils, hot soils, etc.).

Here are some of the observation/problems:

- They are both in decline
- We can assume the trees get most/all of their water from the lawn irrigation system, but don't know how often or amount being irrigated.
- Many areas of Colorado have high pH (alkaline soils) and certain tree species such as maples and oaks cannot absorb iron because it's in a chemical form unavailable to plants, though iron is often in sufficient amounts (see the chart that relates to pH and accessibility of nutrients).
- The lawn looks healthy...so is this a fertility issue? Probably not. It could be overwatering, compaction, or other issues.
- It's hard to determine if the trees were planted properly, though there appears to be evidence of a root flare on the tree on the right.
- We can't tell if there is any physical damage to the trees (ie. from planting, sunscald, frost crack, human or vehicle). Mechanical damage could have injured or killed conductive tissue on the trunk so that water and nutrients aren't getting where they are needed.

If the homeowner insists on treatment, a chelated iron product could be applied (EDDHA, EDMA). However, the progression of damage is extensive and removal/replacement should be considered.

CHALLENGE 4: The Case of Gators-gone-wrong

- What happened to these newly planted trees?
- What clues do you have to determine their demise?



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- **Note that the bur oak foliage is showing signs of scorch/decline.** Even though bur oak is a drought tolerant tree, it needs regular water to become established, like all newly planted trees.
- **The “turf” around the trees is mostly weeds,** which are also drought stressed.
- **Gator bags work for new plantings if they are checked** to make sure they still have water on a regular basis—the only way to determine this is to lift them. Gator Bags always look full!
- **The soil appears very dry.**

Conclusion: Following planting, irrigation was not provided. The biggest limiting factor of tree survival is water. Since these trees started off their transplant life drought-stressed, it will take tremendous resources for the trees to recover, if they do. Gator Bags are not a viable solution if maintenance to replenish them with water is not provided.

CHALLENGE 5: **The Case of Mr. Fix-it**



This crabapple branch split during a late spring snowstorm. The homeowner made this repair and both sides of the branch continued to produce leaves all season – and in the next year as well.

- Why would someone use this technique to repair the damage? Is it an effective long-term solution?
- What do you think will happen to this branch?

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A homeowner might use this technique because it is similar to action they might take in repairs around the home or shop. It's a logical step to think that plant physiology might work the same way as home plumbing.

- **Tree branch wounds do not “heal” or close, longitudinally.** The reason that the two sides of the branch could produce leaves for two years is because of stored carbohydrates. Carbohydrates are stored in many places in the tree including branches, buds, twigs and trunks – in addition to roots. The conductive tissue is still intact – at least partially – on both sides of the branch to aid in the flow of water, nutrients, and carbohydrates.
- **The homeowner may think this is a successful technique because he/she sees the live growth.** BUT that tape and the clamps will ultimately cause compression and girdling.
- **The wound is also a good location for pests** to infest the tree and the breakage is a stressor. The branch should have been removed back to where it attached to the trunk.

Note: The branch was removed in the third season following the snowstorm. It died.

CHALLENGE 6: **The Case of The Octopustree**

Why can you see the tree's roots above the soil line?

Do you see evidence of planting errors?

How would you improve this situation for tree health and aesthetics?



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You can see the roots above the soil line because of soil compaction/oxygen issues which caused the roots to grow close to the surface. When the tree was planted the soil may have been heavily amended with organic material, which has since decomposed, exposing the root system.

The planting error was using landscape fabric (which could have contributed to the shallow root growth early in the tree's life)...**and possibly over-amending the planting hole with organic matter.** We can see the trunk flare, which means it's not planted too deep—a positive!

To improve the situation:

- **Remove the landscape fabric and cover the roots with bark mulch** keeping the immediate area (about 6-12" or more) around the trunk free of mulch.
- **Bark mulch is a good option because it is coarsely textured** and will still allow for good oxygen and water exchange for the root system. Covering the roots with soil can lead to reduced oxygen levels.
- **It would be a good idea to determine if the drip tube is still functioning.** If it is, it is not doing much, if any, good and could be capped. Avoid digging around the tree to eliminate potential damage to the root system.

CHALLENGE 7: The Case of You-Name-It, It-Went-Wrong

What likely caused the vertical split?

What is the most obvious planting error?

The bark mulch was pulled away from the base of the tree during diagnosis.

- Is it problematic to have new fine root growth near the base of the trunk?



- **Either sunscald or a frost crack caused the vertical split**—this looks more like sunscald, based on the length and bark splitting.
- **The most obvious planting error is that it is planted too deep** (note the lack of root flare), plus you can see the tree is more narrow where the soil meets the trunk.
- **It's not problematic to have fine roots near the base of the tree—until they grow into larger roots, which can potentially girdle the tree.** The roots are there because it's where oxygen was most readily available. Sometimes when trees are planted too deep, they will form a second, higher set of roots to obtain oxygen. Sometimes the roots will grow upward in an attempt to obtain oxygen.
- With the split so bad in combination with the tree planted so deep, **the best option is to remove the tree and start over with a tree that is correctly planted** and use tree wrap for the first few seasons.

CHALLENGE 8: **The Case of the Tree with a Waist**



The homeowners were concerned about the spruce tree having heavy sap flow (see left side of the trunk). The tree canopy appeared to be thinning.

- What planting problem do you see?
- What can be done to amend this situation?

- **The planting problem is that the staking strap was left on the tree too long** and became embedded in the trunk. This means the stakes were left on much longer than 6-12 months.
 - Trunk compression occurred, forming the “waist” on the trunk. When staking straps are left on too long, you’ll see a compression in the trunk—likely with swelling above the point of attachment. The compression damages or kills the conductive tissue and carbohydrates often begin to accumulate above it because they can’t move past it.
 - The embedded strap has damaged or killed conductive tissue in the trunk.
- **The sappiness is likely due to the stress created by the compression and embedded strap**—the response of the tree is to create sap in order to “heal” from the injuries.
- **The thinning canopy can also be related to these injuries in that water and nutrients cannot move to the upper portion of the tree** – or sufficient water and nutrients can’t move there. Once the tree uses its stored energy resources above the injury, it will die. Cultural practices should also be investigated to determine what else might be contributing to the thinning canopy.

CONCLUSION: The strap should be cut off close to the trunk – without further damaging it. The homeowner should not try to yank it out since that may cause further injury. This injury could cause a weak area that could eventually break off at that point. Recovery depends on the severity, the tree species, and other environmental factors.