



Site Evaluation

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Tree Species Evolved to Grow in Different Places

Silver maple

From floodplain swamp
Waterlogging tolerant



Bur Oak

From savannahs
Drought tolerant



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Playing Matchmaker

- Different species prefer different growing conditions
- Evaluating conditions at a site can help us choose species that thrive in that location.



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Looking for Red Flags

Site evaluation helps us look for red flags that tell us it may not be a great place to put a tree.

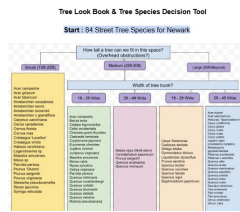


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Basic Process

1. Check soil compaction
2. Look for problems overhead
3. Look for problems belowground
4. Check how much sunshine
5. Check soil moisture
6. Bonus – Check pH



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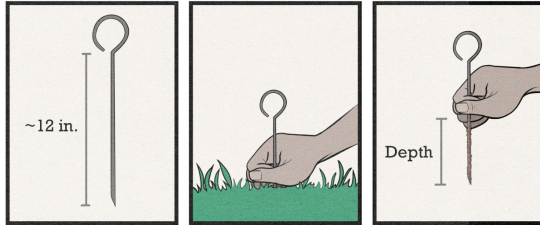
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Let's go outside!

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1. Soil Compaction Testing



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1. Soil Compaction Testing



Severe compaction: you can't push the wire more than **4 inches** into the ground

- This space may be difficult to grow a tree in. Consider a method to decompact the soil before planting.
- Moderate compaction: you push the wire **4 to 12 inches** deep
 - Consider a decompaction process.
 - Also consider a species that can tolerate compacted soil.
- Acceptable: you push the wire **more than 12 inches** deep
 - Soil compaction is not a limitation for species selection here.

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2. Look up – Wires?



Are there wires above the planting area? Remember that the **tree's crown** will get wider as it grows.

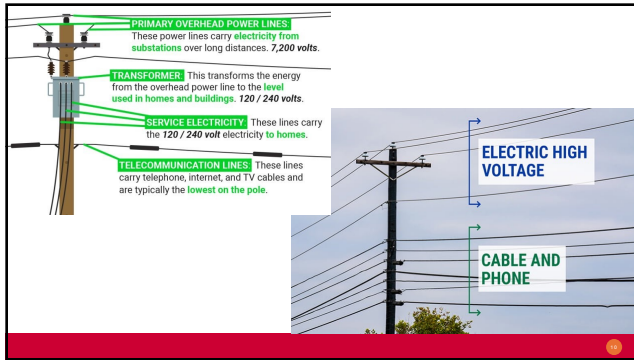
Yes.

Choose a species that will be less than 25 feet tall as it matures.
Or consider alternate planting site if wires appear very low.

No.

A shorter species may not be necessary here

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2. Look up – Another tall tree?



Is the planting site in a sidewalk setting and under the crown of another taller tree?

Yes

This is probably not a good planting spot.

No

This is not a limitation, continue site evaluation.

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2. Look up – Utility poles?



Is the planting area within 10 feet of a utility pole?

Yes

This is not a good planting spot, the City does not allow new trees to be planted near utility poles.

No

This is not a limitation, continue site evaluation.

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3. Look down – Call 811

Call 811 at least three days before starting project. Are there are buried utilities under the planting site?



Yes
This is not an acceptable planting site, the City does not allow new trees to be planted above underground utilities.

No
This is not a limitation, continue site evaluation.

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**UNIFORM COLOR CODE
FOR MARKING
UNDERGROUND UTILITY LINES**

White	PROPOSED EXCAVATION
Pink	TEMPORARY SURVEY MARKINGS
Red	ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES
Yellow	GAS, OIL, STEAM, PETROLEUM OR GASEOUS MATERIALS
Orange	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES OR CONDUIT
Blue	POTABLE WATER
Purple	RECLAIMED WATER, IRRIGATION AND SLURRY LINES
Green	SEWER AND DRAIN LINES



< Trees can be damaged during work on buried utility lines.

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3. Look down – Planting space

Is the planting space smaller than 10 feet x 5 feet?



Yes
See next question.

No
This is not a limitation, continue site evaluation.

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3. Look down – Planting space

Is there room to make the planting space bigger? Remember that the sidewalk must be at least 3 feet wide*.



Yes

If you want to enlarge the space, you'll need to get permission from the City

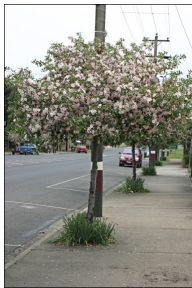
No

Select a small species that will have a more compact crown for the site.

*Complies with American Disabilities Act

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< Example of a small tree (crabapple) in a small planting area.

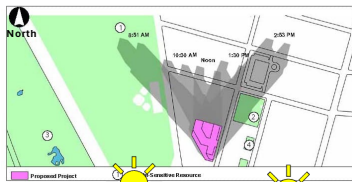
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4. Sunshine

When checking the amount of light at a site, pay attention to the height of nearby buildings and whether they are located north or south of your planting site.

Taller buildings will cast shade further.



The north sides of buildings will get much less sun.

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4. Sunshine

On a sunny day, preferably in the summer when the sun will be highest in the sky: check on a site several times to estimate the total hours of direct sunlight. The hours don't have to be all in a row.

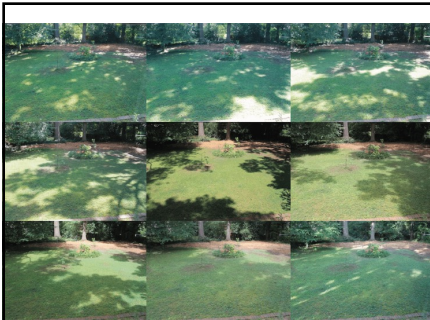
0 hours of direct sun, no view of the sky:
Probably not a good spot for an urban tree.

Less than 4 hours of direct sun:
Choose a species that tolerates full shade.

4 – 6 hours of direct sun:
Choose a species that tolerates part shade (some sources will call this part sun).

More than 6 hours of direct sun:
Choose a species that tolerates full sun.

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These photos taken at different times of the day show how shade changes over the day.

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5. Water – Where is the planting area located?



Is the planting area on top of a hill or partially sheltered from rain? Or is the area disconnected from where stormwater flows?

Yes: probably a drier site



Is the planting area neither at the top or bottom of a hill?

Yes: probably a moderate moisture site



Is the planting area at the bottom of a hill, in a place where water collects, or does it receive rainwater from the street or gutter?

Yes: probably wetter site

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5. Water – What is the soil's general **texture**?



Does the soil have a very sandy texture?

Yes: probably a drier site



Is the soil neither very sandy or very clayey (a loamy soil)?

Yes: probably a moderate moisture site



Does the soil have a very clayey texture?

Yes: may be a wetter site, though compaction could make the soil drier.

Look for species that tolerate clayey soils

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Texture by Feel Method

- Take a handful of soil and add water until it is the consistency of putty or mashed potatoes.
- When you try to squeeze the soil together into a ball, does it just fall apart and not want to stick together?
 - Sandy texture**



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Texture by Feel Method

- Can you shape the soil into a ball?
- If yes, squeeze the ball between your thumb and forefinger and push it into a ribbon shape. Try to make the ribbon have consistent thickness and width.
- Can you push the ribbon to be more than 2 inches long before it breaks?
 - High clay content**



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Learn more about the texture by feel method

<https://www.nrcs.usda.gov/sites/default/files/2022-11/texture-by-feel.pdf>

<https://youtu.be/IOvaBxi767s>

Guide to Texture by Feel

Revised from G. S. Wilson, 1978, A flow system for matching species to their growing. Journal of Agriculture. Extension, 4(1):15. (Link goes to a high resolution version of this graphic.)



Eye on Agriculture Today: Soil Texture By Feel

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5. Water – Is the site near reflective surfaces or asphalt that could get very hot in the summer?



Is the site near reflective surfaces or asphalt that could get very hot in the summer?

Yes; this site may dry out more easily in the summer

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5. Water – Nearby species?

Are there other trees growing nearby that seem to be thriving? If so, list out the species based on their tolerance for drier, wetter, or moderate soils.



A planting site with a lot of other drought tolerant species nearby would probably benefit from another drought-tolerant species.

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5. Water – Choose species that tolerate:



Excessively drained soils or drought



Well drained soils (medium moisture)



Poorly drained soils (wetter) or flooding

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6. Bonus - pH

If time and resources permit, check the soil pH to ensure the planting area soil pH is not too extreme.

Is soil pH greater than 8?



Yes

- 1) Consider a different planting area
- 2) investigate options for decreasing soil pH
- 3) Choose a tree species that is tolerant of high pH

No

Very high soil pH is not a limitation here.

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6. Bonus - pH

Is soil pH between 7 and 8?

Yes

Avoid choosing species that prefer acidic soils

No

Elevated pH is probably not a limitation here.

Remember to record the pH that measure to help narrow down species choice later if needed.

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Testing pH with Test Strips

Supplies:

- pH test strips
- Small paper cups
- Measuring scoop
- Distilled water

Step 1:

- Collect soil with a small shovel
- Scoop about 6 inches deep
- Remove large objects like stones and roots
- Allow to air dry



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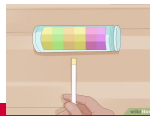
Testing pH with Test Strips

Step 2:

- Place one scoop of dried soil in paper cup
- Add one scoop of distilled water
- Mix thoroughly for 30 seconds
- Wait 10 minutes to settle

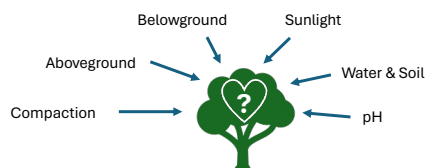
Step 3:

- Dip test strip into mixture so strip become fully wet
- Follow test kit instruction to wait for color to change
- Compare strip to chart



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All together, this info helps us match trees to the right site



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Some helpful resources to learn about species preferences

- Jersey Friendly Yards (<https://www.jerseyyards.org/plant/>)
- North Carolina Extension Gardener Plant Toolbox (<https://plants.ces.ncsu.edu/>)
- Missouri Botanic Garden Plant Finder (<https://www.missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx>)
