

Successful Gardening Amid Tree Roots

Trees are long-lived complex organisms with a permanent architecture. They provide important contributions to gardens and the greater environment, including economic and infrastructure benefits, habitat, and emotional wellbeing.

Misunderstanding about tree roots have resulted in the decline and loss of large trees that are not readily replaced in our lifetimes.

Successful companion planting depends on understanding how and where tree roots grow, and choosing compatible companion plants and cultivation methods.

Do you know where and how tree roots grow?

- Tree roots generally extend far past the canopy.
- In mature trees, large woody anchoring roots are distributed radially around the trunk; tap roots are most common in young trees, then diminish as the tree matures.
- The majority of roots responsible for nutrient and moisture uptake are within the top foot of soil.
- Surface broadcast turf products can be absorbed by tree roots that share that soil space.
- Root growth can continue in autumn while shoot growth is dormant.
- Adding fill soil over tree roots and burying the trunk is harmful to tree health.
- Tree roots will proliferate where there is adequate moisture and oxygen for their metabolic functions. They don't typically bridge through highly compacted soil or strong interfaces between soil types in a soil profile.

Tree Tolerances to Root injury

Healthy trees can tolerate a modest level of root loss. Significant garden changes that include trenching for irrigation, grade changes, and installation of large quantities of plants near the trunk can greatly affect tree roots.

As a general guideline, consider the Critical Root Zone area as having a radius equal to 1 foot for every inch in trunk diameter measured at 4.5 feet above grade (an 18" diameter tree has an 18-foot radius CRZ). Activity outside that zone typically has minimal impact. The closer to the trunk root injury occurs, the more significant the impact. Stressed trees will be less tolerant to root zone impacts. When building or garden construction is planned within close proximity to trees, an early assessment by a consulting arborist can provide guidance on methods of design and construction to minimize impacts to the trees.

Competition between Trees and Turf

- Their roots share soil space.
- They come from inherently different ecological conditions.
- Young trees may suffer from root competition with turf and “mower blight” to their trunks.
- Turf will suffer from shade and root competition from large trees.
- Segregate trees and turf in the landscape with large mulch rings or landscape beds.
- Use modest topdressing with compost or soil to even out divets where tree surface roots are being scalped by the mower, but do not bury surface roots.

Common Landscape Activities that Can Impact Established Trees

- Burying tree trunks.
- Significant grade changes.
- Significant changes to drainage and/or irrigation.
- Trenching within the critical root zone.
- Tilling and repeated soil disturbance within the critical root zone.
- Adding irrigation that routinely wets trunks.
- Compost and/or fertilization rates that exceed tree needs and adaptations.

Low Impact Methods for Successful Gardening Amid Tree Roots

- No-till soil preparation. Minimize soil and root disturbance.
- No weed barrier or cardboard sheeting around trees.
- Apply woody mulch before planting.
- Keep mulch and compost applications away from contact with the tree trunk.
- Use smaller size nursery stock and plant in fall.
- Use surface installed drip-emitter tubing or soaker hose.
- Keep irrigation water away from direct contact with tree trunks.
- Select companion plants that are adapted for growing with trees and have similar nutrient and moisture needs.
- As trees mature and alter the growing conditions for surrounding plants, replace any declining companion plants with better adapted selections instead of trying to alter the tree.

Resources and References

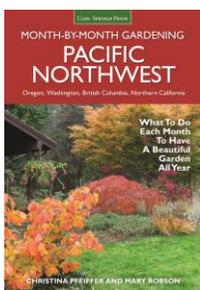
[Tree Owner’s Manual – National Edition](#). US Forest Service Publication NA-FR-01-10 Downloadable PDF.

[Tree Protection on Construction and Development Sites](#) – A Best Management Practices Guidebook for the Pacific Northwest. Oregon State Extension bulletin EM 8994. Downloadable PDF.

PNW-International Society of Arboriculture - <https://pnwisa.org/page/choosing-a-qualified-arborist>

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Pacific Northwest Month-by-Month Gardening by Christina Pfeiffer with Mary Robson. Cool Springs Press