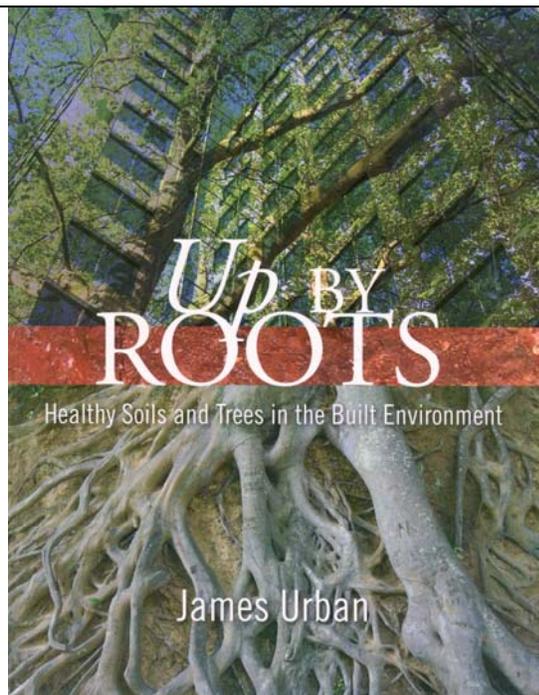


To

Date

Thursday April 23, 2009
5 pages from Mario Lanthier



The “Up By Roots” regional workshop was held on April 14 in Oregon City, near Portland. It was attended by 70 persons (only 2 from B.C.), mostly practicing arborists and a few landscape architects.

The presenter was James Urban, a renowned USA landscape architect. He reviewed materials and ideas from this 2008 book “Up By Roots: Healthy Soils and Trees in the Built Environment”.

The workshop was sponsored by the International Society of Arboriculture and the American Society of Landscape Architects.

“Make the right space for the right tree”

James Urban is turning around “Plant the right tree in the right space”.

- The planting hole should be prepared before planting the tree. It is better to plant fewer trees in good planting holes, than planting more trees in poor planting holes.
- City soil is not the same as farm soil. It does not grow a food crop, it may contain fill trucked from far away, compaction cannot be fixed easily, it offers limited root space.

Compost, compost, compost

“Get the compost into the soil, do not simply place it on the surface.”

- Urban suggests the use of compost is important to fix many urban soil problems.
- It helps correct compaction and poor drainage. It provides air space around roots.
- It helps correct soil biology, reducing the need for chemical fertilizers.
- The specification: “Compost should be the colour of a 70% dark chocolate bar.”

The “10-step program” to reform landscape designs

- Step 1: *Plant the easy places first.* Locate the tree in the best and largest soil site.
- Step 2: *Make larger planting spaces.* Especially where there is a conflict with paving.
- Step 3: *Preserve and reuse existing soil.* Good soil is an irreplaceable resource.
- Step 4: *Improve soil and drainage.* Soil quality is more important in smaller sites.
- Step 5: *Respect the base of the trees.* Design to account for the growth of root crown.
- Step 6: *Make space for roots.* Design to allow roots under pavement in small spaces.
- Step 7: *Select the right tree.* Better planting sites will expand the list of usable trees.
- Step 8: *Establish a reasonable tree and soil budget.* To reduce maintenance cost.
- Step 9: *Create detailed construction documents.* For example, the planting technique.
- Step 10: *Design for maintenance.* Respect the expected maintenance of new plantings.

Soil compaction

“Compaction is the most lethal form of soil damage, and the most difficult to fix.”

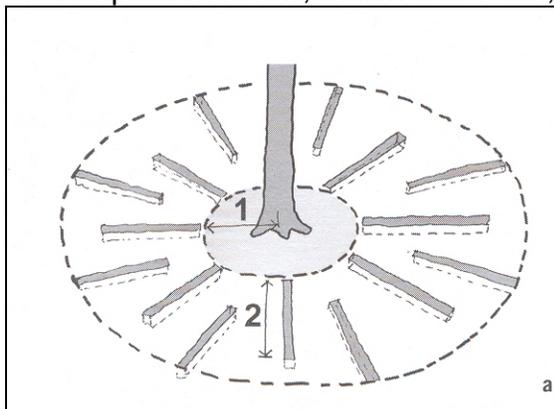
- During construction, heavy equipment driving on the soil surface will compress large air spaces into small air spaces, removing the soil’s ability to hold water and air.
- Compacted soil makes it more difficult for tree roots to grow.

“There is no other way to alleviate soil compaction than to break it up.”

- In the home garden: double spading (dig down two lengths of a shovel blade).
- At the farm: subsoil tilling (drag deep chisels into the soil, 60 to 75-cm deep).
- Urban sites: trench subsoiling (dig 10-cm wide trenches, 1 m apart, fill with compost).

“When compaction occurs near large trees, the problem is close to the surface.”

- Protect large roots from cutting. Avoid adding irrigation to the soil under large trees.
- Vertical mulching: make holes 15-cm wide, 15-cm deep, 1 m apart, fill with compost.
- If compaction is low, mulch 5 to 7-cm, drench with humic acid, kelp or compost tea.



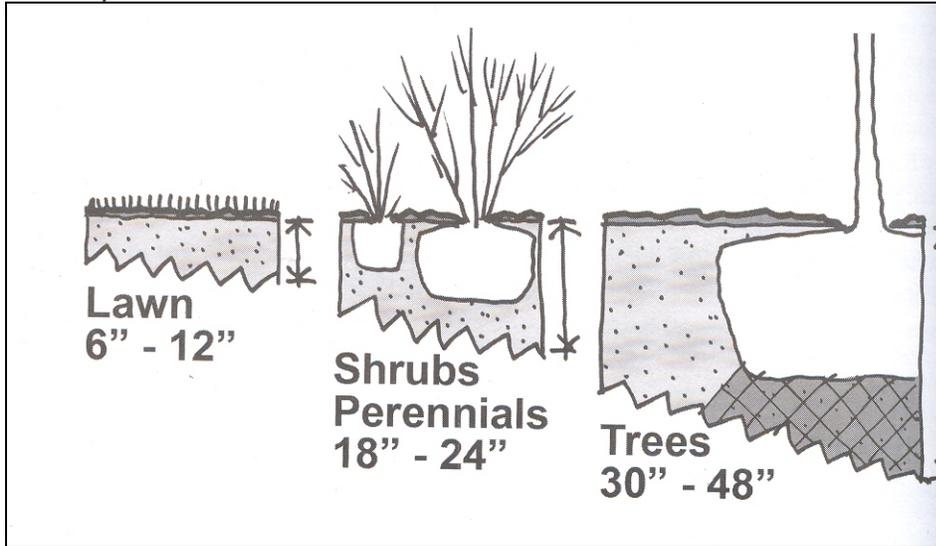
Left: Drawing of radial trenching

This practice is done within the drip line of an existing tree to improve rooting in a soil that has become compacted.

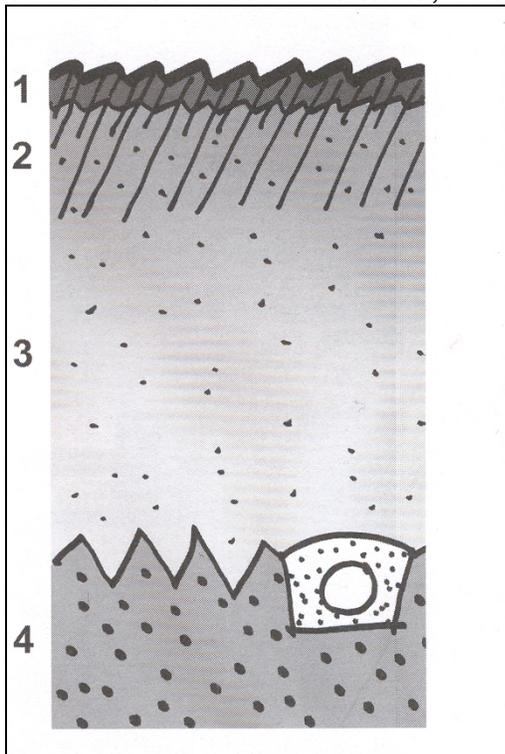
- 1) *Start 2 meters away from the trunk.*
- 2) *Trenches are 12 to 15-cm wide, 15 to 30-cm deep, 2 meters long or up to the drip line of the tree.*

PLANTING IN SHRUB BEDS

*Below: Recommended soil installation depth for various plants.
Soil should be as deep as practical. Thinner soil and sandier soil will dry out faster.
In hotter and windier sites, design a deeper soil to reduce future irrigation maintenance.
Soil depth does not include the mulch and is measured to the average rough surface.*



*Below: Typical soil profile for trees. The surface can be mulch, shrubs, ground cover.
Set design grades to anticipate 5 to 7.5-cm of settlement over the first 10 years.
To avoid excessive settlement, do not exceed 15% compost in soil deeper than 30 cm.*



1) "O horizon"

5 to 7.5 cm of mulch

Provide for regular replenishment of this layer

2) "A horizon"

10-cm of compost tilled into top 15-cm of soil

Preferred: composted yard waste

3) "B horizon"

75 to 100-cm of mineral-based soil

(this depth includes the A horizon)

Mix 10 to 15% volume of high-lignin compost

Compact to bulk density 1.35 to 1.55 Mg/m³

4) "C horizon"

Subsoil, usually native soil

Drainage 2.5 cm / hour, minimum 1.0 cm / hour

If drainage is poor, install sub-surface drain tiles

Roughened or till the surface before filling.

PLANTING IN SIDEWALK

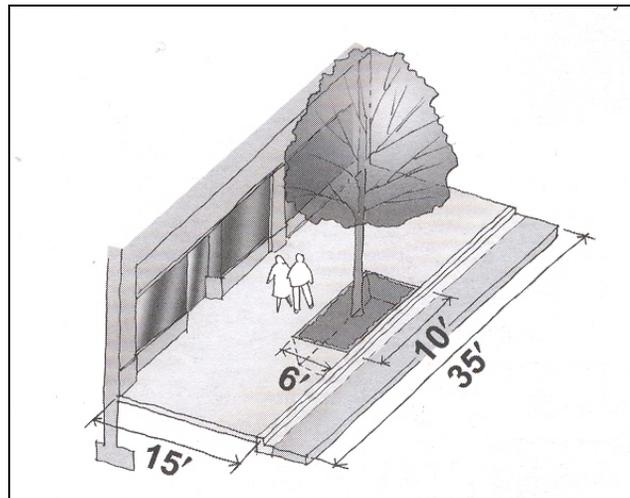
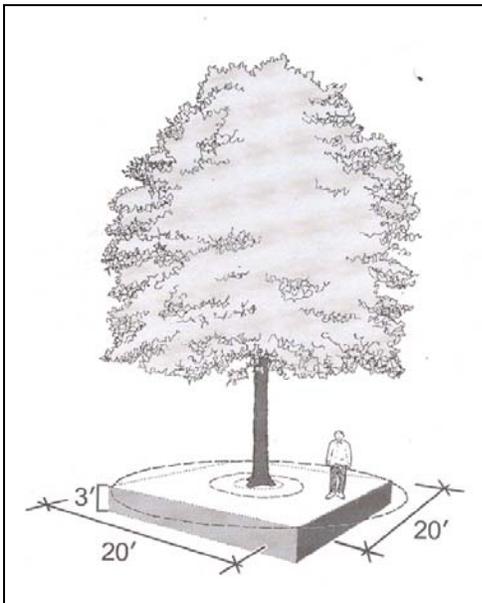
“When we plant on a roof top, everybody understands there is no soil and we need to bring it. Why is it difficult to accept there is no soil when we plant a sidewalk?”

- The soil volume required is proportional to the trunk diameter at maturity.
- Rule of thumb: trunk 50-cm diameter (20-in) requires 34 m³ of soil volume (340 ft³).
- “Do not install tree grates or you will go to tree hell. Instead, use mulch.”

Below left: Minimum tree planting space is 20 feet long X 20 feet large X 3 feet deep. A smaller planting space can be designed, but it is not optimum.

Make paving the minimum necessary and planting space the largest practical.

There is no “mimimum size” for the opening. The future conflict will be the trunk flare.



Above right: A long planting hole (rather than a square hole) in a sidewalk.

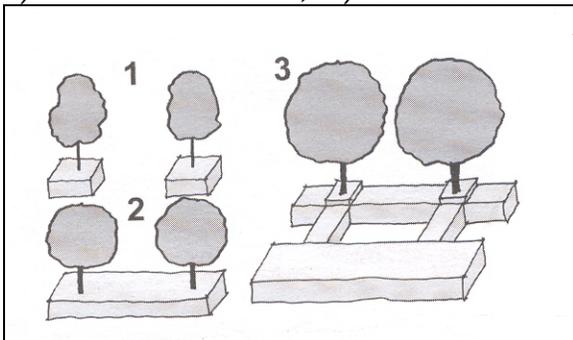
A compromise is to make the tree space longer in the direction of pedestrian travel.

In areas of intense pedestrian activity, use a curb or fence around the planting space.

Below: Different methods will ensure adequate soil space when planting a sidewalk.

Plant near a lawn or garden. The tree roots will grow into it to access water.

1) limited soil volume; 2) connected soil volumes; 3) connections under pavements.



All drawings by James Urban

SOIL MANAGEMENT METHODS



Above: "The Dutch auger is an invaluable tool to know more about the soil before planting." The hand held instrument is turned into the soil then pulled out to extract a soil carrot. The pulled soil is examined visually for depth profiles and soil layers.

Below: "To work with trees you have to get your hands dirty with soil from the ground." An on-site test helps determine soil type. Make a small handful of soil that is slightly moist. Can you make a ribbon? It contains clay. Does it feel gritty? It contains sand. Smooth? Silt.

