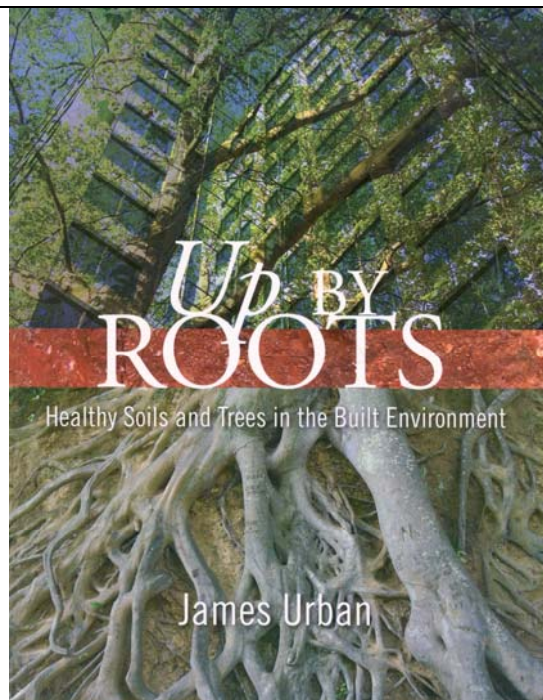


To

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.”*

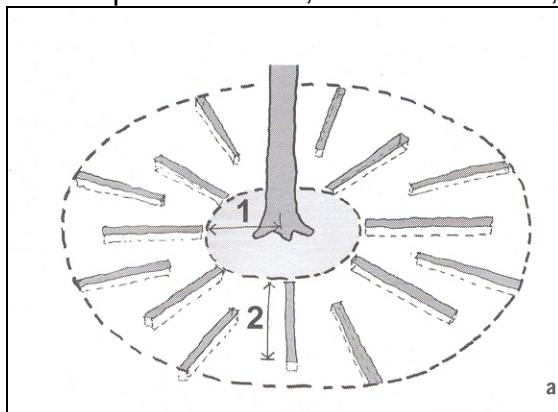
- During construction, heavy equipment driving on the soil surface will compress large air spaces into small air spaces, removing the soil’s ability to hold water and air.
- Compacted soil makes it more difficult for tree roots to grow.

*“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.



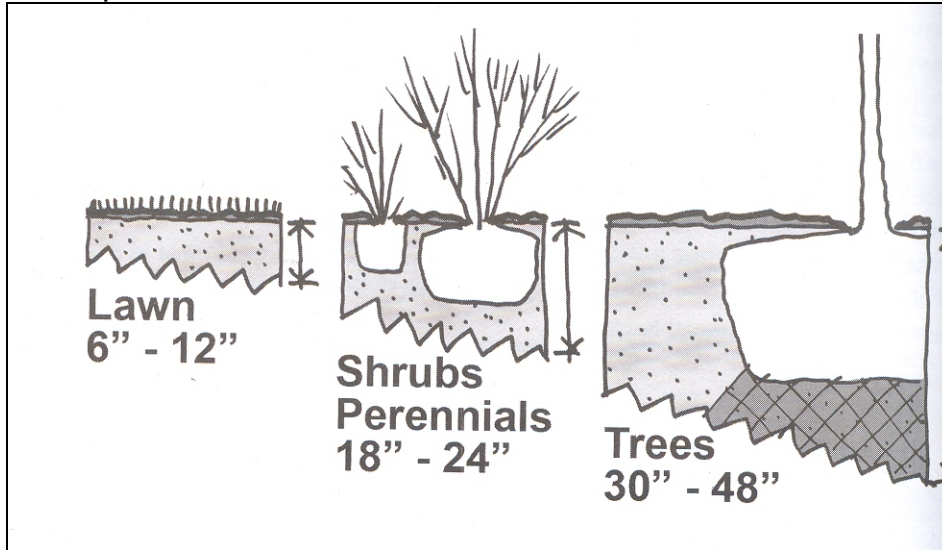
*Left: Drawing of radial trenching*

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

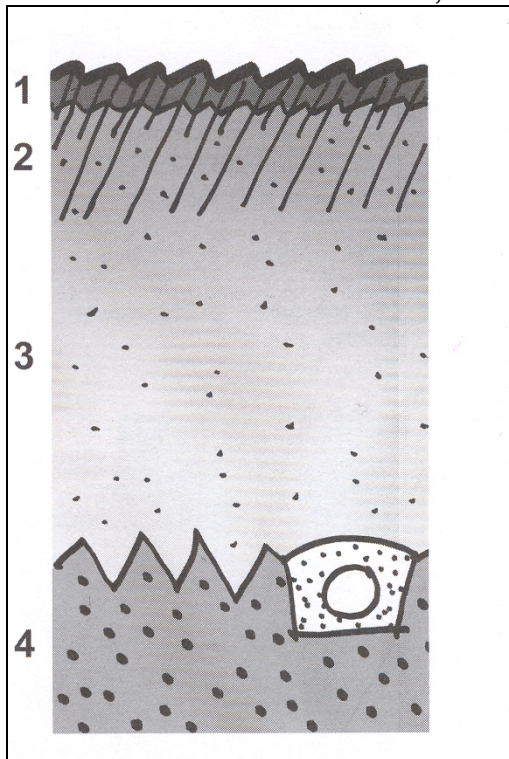
- 1) *Start 2 meters away from the trunk.*
- 2) *Trenches are 12 to 15-cm wide, 15 to 30-cm deep, 2 meters long or up to the drip line of the tree.*

## 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/m<sup>3</sup>

### 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

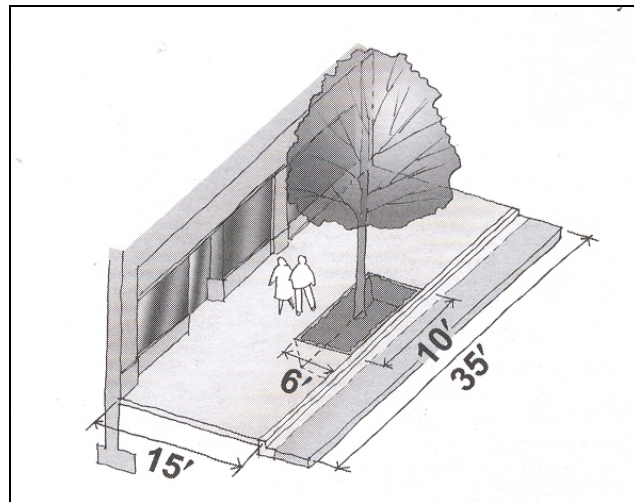
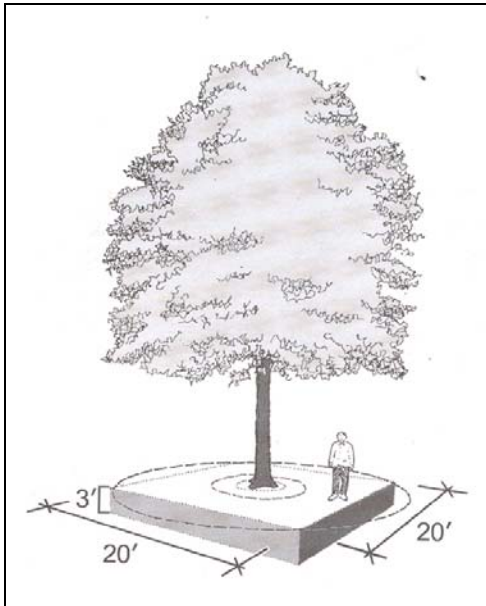
*“When we plant on a roof top, everybody understands there is no soil and we need to bring it. Why is it difficult to accept there is no soil when we plant a sidewalk?”*

- The soil volume required is proportional to the trunk diameter at maturity.
- Rule of thumb: trunk 50-cm diameter (20-in) requires 34 m<sup>3</sup> of soil volume (340 ft<sup>3</sup>).
- “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.*

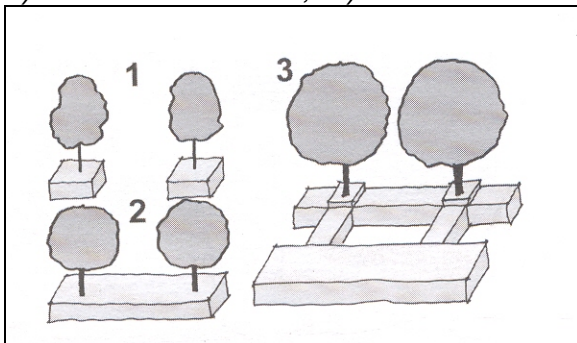
*A compromise is to make the tree space longer in the direction of pedestrian travel.*

*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.*

