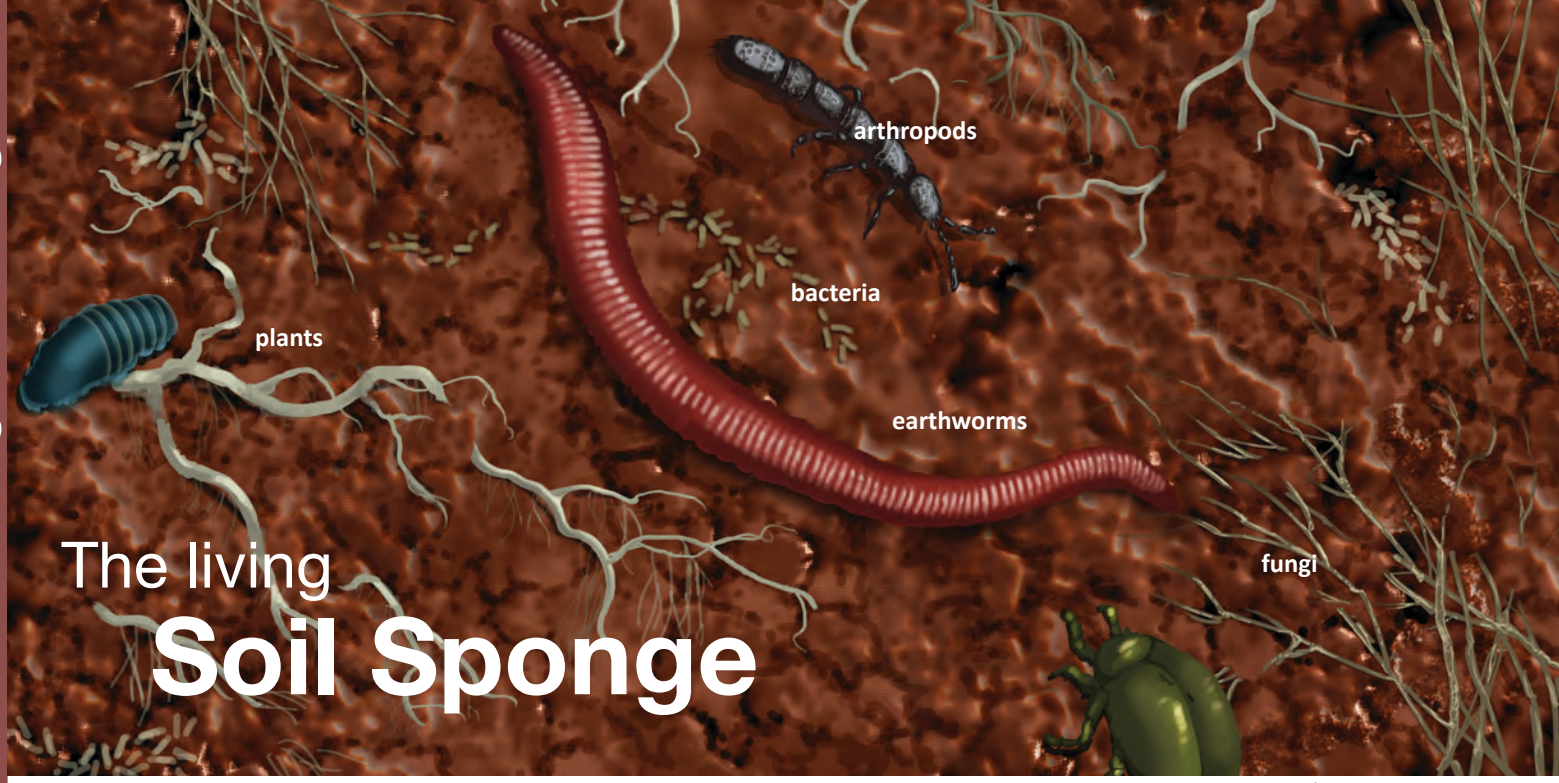



# The living Soil Sponge



## OWL (Oxygen, Water and Life) makes **Living Soil**.

Living Soil is alive, and it is essential to a healthy garden. A teaspoon of good garden soil contains annelids, insects and other invertebrates, billions of invisible bacteria, several yards of equally invisible fungal hyphae, several thousand protozoa, and few dozen beneficial nematodes. Microbes bind soil together and, when OWL is balanced, billions of microbes work in concert with the roots of plants to be the change agents that transform brick-like dirt into a healthy, living soil sponge.

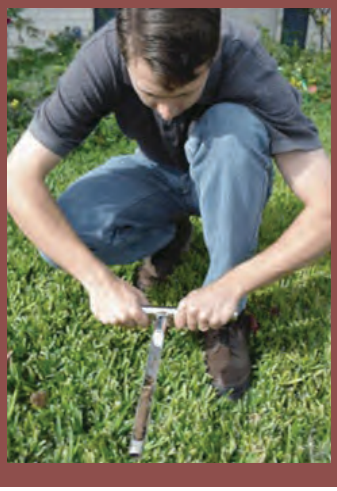
**Oxygen** is needed by healthy plant roots and soil organisms. Healthy soil has lots of little pockets filled with air. When soils are eroded, graded, or disturbed, their structure becomes compacted. Compaction is caused when the tiny air and water bubbles are squeezed out of the soil and the microbes are killed or demobilized. Microbes can be killed by fertilizer and pesticide use or even heavy traffic (foot or vehicular).

**Water** is needed by both plants and microbes. But too much water in the soil displaces the oxygen, saturating the soil and creating an anaerobic (no oxygen) condition. Pathogenic microbes prefer anaerobic soil, and if this condition persists, diseases may develop, thus endangering the health of your garden.

Water is constantly moving through the soil. Any water in the soil needs to be replenished as the plants use it, as it evaporates from the soil surface, and as gravity pulls it down past the root zone.

**Life** in the soil includes all the visible creatures, bacteria, protozoa, nematodes, and fungi, the food they eat, the excretions they make, and the root systems they sustain. Adding good quality compost into the soil is the fastest method of incorporating living microbes.

Plants act like microbe farmers, attracting microbes to their roots by feeding them carbon. Plants know what they need to grow strong and stay healthy, and they can target members of the microbial community with specific compounds in order to get what they need at the exact time when they need it. These billions of microbes all need water and oxygen, so there is a lot of jostling around, creating miniscule air pockets. Bacteria and fungi hold the soil together with microscopic superglues and binders. Carbon and other nutrients are cycled through these many life forms, creating healthy, living, well-structured soil, no matter what the base soil type.



## Use a Soil Probe

A soil probe allows you to determine a lot of information about your soil. It will come in handy when you are trying to figure out whether water is reaching the plant roots or even going too deep beyond the roots' reach.

Press the probe into the ground, twist and pull out to take a sample. Take multiple samples from around your garden. How deep are your plants' roots?

Use this kind of probe on a regular basis if you are maintaining your landscape. It is a quick tool for determining whether or not your irrigation schedule is providing enough water.

Purchase a soil probe online or at your local irrigation warehouse; or ask your designer to purchase one for you.

# Grow a great soil **Sponge**

Try to avoid excessive disturbance of the soil. But, if it happens, make sure you add **Oxygen**, **Water** and **Life** in the form of really good compost as soon as possible to get the soil critters working again. Good organisms turn dirt into a great living soil **Sponge**.

## Eliminate **Compaction** by loosening soil.

If you can press a pitchfork into the soil, then that is all you need to do to create air holes.

If the soil is heavy clay, then augering or tilling may be necessary. Immediately after augering heavily compacted areas, fill the holes with good compost or earthworm castings. Then water the whole thing thoroughly to get the biological processes kickstarted. Remember that augering and tilling damage the biological network already existing in the soil, so they should be employed only when absolutely necessary. **If you have a lawn, aerating twice a year will help eliminate compaction.**

After decompacting, three essential practices for maintaining soil oxygen are:

1) Feed the soil good organic matter from the top down only.
2) Plant annuals like sunflowers with jack-hammer root structures to open clay soil.
3) Manage water so things don't get too saturated or too dry.


## **Water Wisely**, first with rainwater.

Rainwater lacks chloramines and is slightly acidic, providing the perfect chemistry for both plants and microbes. Rainwater should be directed into landscapes at every opportunity.

**Irrigate** only to maintain the water balance in soil (*see p. 50*). Too much water saturates soil and results in the anaerobic conditions that promote diseases. Too little might result in microbes drying up or going to sleep. When microbes are no longer cycling nutrients for the plants, the roots will die and the plant might too.

## **Feed** your soil.

Organic matter improves the water holding capacity of soil. You can get organic matter from a wide variety of sources, including compost and living mulch. Once you get things started, plants manufacture their own soil-building organic matter by dropping leaves, blossoms, and other debris.

Mulch, compost and compost tea can be applied to the surface of the soil and used as amendments during planting and soil preparation (*see pp. 40-41*).

Ornamental plants do not need to be fed with fertilizers (even organic ones) if you maintain OWL. Fertilizers make the plants lazy about attracting microbes to cycle nutrients; this diminishes the plants' immune response and may compromise their resilience, particularly if they are put under stress from drought or pests.

## No Weed Cloth!


It looks like weeds grow right through weed cloth. Weeds are actually encouraged because OWL is kept from happening when the organic matter from fallen leaves doesn't touch the soil.

## Leaf It in Place

Keep leaf litter and grass clippings on the soil surface, under the plants from which they fall, instead of removing them during maintenance. Be careful not to pile up leaves or mulch against the trunk of the plant.

## Go "No Blow"

The last thing plants need is hot, dry air noisily blowing dust around. Stop drying out your garden and use a rake for everything but the largest hardscape areas where an electric blower might be used judiciously.

## Tea for Two

Compost tea and worm castings offer a microbe jump start, providing many benefits of compost in an easily-digestible aerated liquid (compost tea) or dry form (worm castings), already teeming with life.