

Soil's Labyrinth

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Drawn to just about anything displaying nature's intricately woven bounty, I was mesmerized by the film, "Pan's Labyrinth". I also love to travel.

"Pan's Labyrinth" combines both - and more. At a deeper level, it delves into ancient myths and archetypal truths while borrowing images and symbols from nature.

Seeking to escape the horrors of the Spanish Civil War, a young girl, Ofelia, follows a scintillating dragonfly. Eventually, it leads her to a garden's labyrinth. Greeted by a majestic tree that resembles an ancient oak or banyan tree, with its protruding and engulfing roots, Ofelia soon encounters a fanciful and often terrorizing underworld. "Pan's Labyrinth" (or in the Spanish version, "The Faun's Labyrinth") also seduces us into rediscovering the stuff of our daily lives: fallen branches, wet leaves, fog, strange insects, - and the rich, moist soil below.

When it comes to the earth, we can only peel away a thin layer to take a peek inside. As spring warms the fragrant ground below our feet and our fingers experience that zeal to dig - yet once again, we will invariably come upon a panoply of creatures. At first, only old signs from winter will tell us that a slew of wildlife visited our yard. Be they rabbit or deer droppings or the maze of tunnels established (much to our despair) by burrowing voles, they all play a role in establishing a healthy soil. As we begin to dig, however, we discover that there is far more than meets the eye, or for that matter, the spade. And this is where it gets fun. Think of those lovely slimy, wiggly earthworms as they inch their way up to the light. A welcome sign: the soil is healthy. Less visible and discernible, but more fascinating, are the beneficial micro-organisms such as nematodes, protozoa, and mycorrhizae fungi that perform multiple functions from feeding the soil to warding off predatory insects.

Mycorrhizae and soil form a symbiotic relationship. Indeed, each depends on the other. Mycorrhizae make nutrients more available to the soil; the soil acts as the welcoming host. On a more tangible level, be they mammals, rodents, or micro-organisms, all take part in a crucial process: the conversion of plant and animal material into soil, and eventually, humus. With decay there is rejuvenation.

Within this cycle of life, death, and rebirth, soil is intrinsically dynamic and ever-evolving. Under prime conditions that include water, air and temperature (or, if you prefer, nitrogen, carbon, and oxygen), humus is formed. Also known as *black gold*, humus is crucial to the fertility, structure and texture of soils. Physically, it allows the soil to retain moisture (and with the presence of sand, allow for proper drainage). Chemically, "humification" of plant litter allows complex organic compounds to break down and become available for uptake through plant root systems. Without healthy soils that

include the balance of nitrogen (N), phosphorus (P) and potassium (K), plants cannot thrive.

How can we achieve this coveted black gold? It's pretty simple - and not so expensive.

Gather and spread over your garden beds lawn cuttings, shredded leaves and lawn clippings, well-rotted manure and kitchen compost. Not only do these feed the soil but they increase texture. Although the more 'bulky' materials should be applied in the fall, spring is an excellent time to spread compost and manure. Other organic products include sea algae, fish emulsion and for the lawn, corn gluten.

Test the soil's pH value with a do-it-yourself soil test kit. Or, take a sample to a soil testing site or by mail to a university extension service (see below). Why is pH relevant? The higher the pH, the more alkaline the soil; the lower, the more acid. Most plants, but not all, are content in neutral soils which measure between 6.5 and 6.8 pH. However, non-deciduous trees and shrubs such as rhododendrons, azaleas, and daphne thrive in the lower ranges i.e. 5. Blueberries, in particular are fussy: they like it at 4.5, something not easy to achieve in our lime-rich Berkshires.

If need be, alter pH by adding the prescribed amount of sulfur to lower it. This takes time and needs to be repeated over the years. It is far easier to increase alkalinity. Lilacs, for example, prefer a 7 pH. Spreading some lime (and, while you're at it, some ashes from the wood stove) should do the trick.

Iron, calcium and magnesium and additional trace minerals are also important to consider. Since soils contain 13 essential plant nutrients, a more extensive soil test will tell you what your soil may need.

Do not use synthetic fertilizers. Although organic alternatives may be more expensive, in the long run they promote long term soil health. However, if you're planting a new viburnum or need to boost annuals such as impatiens or coleus, a small dose of a 10-10-10 or other mix is not the end of the world. In most cases, established healthy plants do not need fertilizers.

Adopt a "no-till" policy. Although aerating the soil in spring or fall can help solve problems such as lawn thatch, avoiding tilling is far better. "One of the most common reasons that people till the soil is to add air that we have squeezed out of it by tromping back and forth or rolling over it with our wheelbarrows, garden carts, and tractors. It's true that soil needs air, but we don't need a tiller to add it." (Lee Reich, Fine Gardening December 2006)
What it boils down to is: leave the soil undisturbed; let nature do the work.

Tilling, (not a little raking or loosening with a hand tool) undoes the valuable work performed by nature. And, - get this - tilling also spreads more weeds! So, just pull them out manually and make sure to capture the roots.

Hot off the press: A "no-till" policy preserves carbon in the soil thereby preventing its release in the atmosphere. By storing carbon below ground, we contribute less to global warming. American farmers are following the example of Europe; they can now trade carbon credits on the Chicago Climate Exchange.

And so, the earth's labyrinth - and our ability to grasp its beauty and complexity - continues to expand. According to Wikipedia: "The understanding of soil is incomplete. Despite the duration of humanity's dependence on and curiosity about soil, exploring the diversity and dynamic of this resource continues to yield fresh discoveries and insights."

Soil testing:

For Massachusetts: [http://www.umass.edu/plsoils/soil test](http://www.umass.edu/plsoils/soil%20test).

For New York: <http://www.css.cornell.edu/soiltest/newindex.asp>

For other helpful hints:

<http://www.gardening.cornell.edu/index.html>

<http://www.nrcs.usda.gov/feature/backyard/>