



Stephen &amp; Kristin Pategas

## in the garden by Stephen and Kristin Pategas

All photography by Stephen G. Pategas/Hortus Oasis

### Underground

It's rarely seen and mostly forgotten. In developed areas it's covered with buildings, roads, and lawns. It's typically called dirt, but

horticulturists and gardeners call it soil. What's in it and under it is constantly walked upon - the Floridian aquifer, potential sink holes, a variety of soil types, plant diseases, creatures that live in the ground (gopher tortoises, earthworms, and more), utilities (gas, water, sewer/septic, electric, phone, cable, and irrigation pipes and valves), debris, hazardous waste, and perhaps relics from previous inhabitants - which creates the need for archaeologists.

Plant roots face challenges as they seek their way through the soil and around a multitude of obstacles - roots are intimate with these things. At times they hit roadblocks such as structures and water-saturated soils without oxygen - roots need oxygen to survive.

A plant's health is typically judged by what is visible aboveground. Yellowing leaves and dieback on branches are signs of an unhealthy plant. The cause of the decline could be caused by what is occurring underground out of sight where the roots encounter what is not visible. Most tree roots are typically in the top 12 - 18-inches of soil and could be constricted by the foundations of houses, walls, and other structures. Compacted

soils from construction equipment make it difficult for roots to penetrate the ground. There are also pathogens that can cause a plant to decline or die. Mushroom root rot is one fungus that lingers in the soil and is usually fatal, especially if a plant is under stress due to pest problems, lack of water or nutrients, or water-logged soil.

The pH (acid/alkaline balance) of the soil affects whether a plant can take in



At left: Mushroom root rot fungus (seen here when it is fruiting) often causes stressed plants to die. At right: A soil test kit.



Above: These soils are contaminated with construction materials.

nutrients. A high pH (alkaline condition) is typically found where concrete or limerock, which both have a high pH is used. The soil adjacent to building foundations is notorious for high pH levels due to the use of construction products. Acid/low pH-soil loving azaleas which are often used for "foundation plantings" suffer in these alkaline locations. Unless they receive frequent applications of an acidic fertilizer or Sulphur which is acidic, they will have yellowish leaves and stunted growth. Prior to installing plants perform a pH soil test. Soil test kits are available, or the Orange County Extension service can provide that service.

There may be underground obstructions that preclude planting in the planned location. We have witnessed occasions when a tree is already delivered and due to an immovable object, the tree must be planted in a compromised location. It is preferable to plant a smaller tree in the right place than any tree in the wrong place. When planning for the installation



Above: This footer for a retaining wall will block tree roots and stunt growth.

of a tree (especially one with a wide root ball), dig the planting hole before the tree is delivered.

Although out of sight and out of mind, what is underground greatly affects where plants should be planted or how they grow - call it dirt or soil - it is important.

