# Don't Compromise On Your Soil!

By Sam Jones (*Nashville Rose Leaf*, March 2006)

**Don't compromise on your soil!** In fact, between the two, more money should be invested in your soil than in your rose plant. In the first growing season, a frail, first-year plant put into organically rich sandy loam will likely out-produce a vigorous two-year-old, nursery-grown rose set out in poor, compacted, or deficient growing conditions.

**What is good soil?** Surprisingly, it starts with air and water! Without water, nothing grows. But without air, nothing breathes. Your roses are living and breathing organisms. Like you, they are made of oxygen, hydrogen, and carbon. Almost all of the woody substances of plants, including roses, are derived from these three elements, and they come right out of air and water. If you want to enjoy roses, you must offer their roots and leaves (or their "mouths and lungs") an environment where they can get abundant supplies of both.

**Now, what else is good soil?** Only what it takes for roses to absorb and manufacture foods from air and water! The "solids" of good soil are both the containers (holders) and the mechanisms (agents) for roses to extract what they need from the air and the water with the energy of sunlight, producing their beautiful, fragrant, long-stemmed flowers we love to enjoy.

**What are those soil solids?** Basically they are inorganic (rocks) and organic material (by-products of living or dead organisms). Rocks (originally from hardening of earth's molten crust), through erosive effects of air, water, heat, and cold, gradually (over millennia) break down into smaller, usable forms of their internal components (iron, magnesium, silicone, etc), first into a form we call "sand." Over more time sand breaks down into "silt," and over still more eons, perhaps at the bottom of primordial oceans, silt particles become even smaller, compressing (or clumping) into "clay." All these forms of rock erosion—sand, silt, and clay—are quite useful to living organisms, plants, animals, and yes, roses.

Good soil is soil that unlocks the rich chemical potential from clay and, unleashing the "power" of hydrogen (pH—remember the "H-bomb") through compound substances we call acids and alkalines (with positive, negative interactions), makes these agents available to living organisms. In other words, good soil is soil that captures air and water and provides the conditions for supporting life.

**How can you have good soil?** Remember, you must have air and water in your soil, and you must have the chemicals (agents) for living organisms (roses) to manufacture sugars and starches from air and water.

So the first rule, water and air must be able to flow into and out of your soil. If there were only air in your soil (too much sand and silt), your plants would wilt. If there were too much water in your soil (too much clay), your plants' roots would not breathe and would suffocate and die. So, make sure your soil is porous, but not too porous. Such balanced amounts of sand, silt, and clay we call "loam." However, roses prefer a slightly

acidic (pH 6.0-6.5), generous mixture of sand with less clay and silt, which we call "sandy loam,"—creating ideal conditions where they thrive.

Now the second rule is that the chemical compounds in loam must be available to your roses. Living organisms and their by-products, interacting with acidic and alkaline hydrogen ions and molecules help make chemical elements usable by your roses. In other words, your soil must be life-supporting for your roses to flourish, and the more living organisms your soil supports, the better.

**What elements make your soil life supporting?** Not only rich elements available from clay, but also from essential organic materials. Life supports life. Dead and decomposing organic matter results in "humus," producing "humic acid," which increases soil's ability to hold water and nutrients, encouraging more living organisms. One teaspoon of organically enriched loam contains hundreds of millions of bacteria, hundreds of thousands of fungi and algae, and hundreds of nematodes. In an acre of fertile soil live countless mites, millipedes, centipedes, pill-bugs, insects, earthworms, and a few mammals. These all help till the soil, creating air spaces and breaking down the organic residue and inorganic components into nutrients the plants can use (mineralization), while also improving the soil structure (making it "friable").

For life-supporting soil, of all possible amendments, organic materials are critical—for all plants, and especially for roses. Life-fostering soils occur slowly. Think in terms not of weeks or months, but of seasons and years. Above all, apply nothing that would destroy the living, working organisms so vital to good soil and plants.

**What about soils in middle Tennessee?** Native Tennessee soils generally tend toward the acidic, clay-side of the scale. More frequent eastern rains leach out alkaline materials that are prominent in the arid areas of the west—except in those Tennessee plateaus where limestone outcroppings permeate the surface topsoil (in these "cedar glades" agriculture sulfur can help counteract an *alkaline overbalance*). In addition, while heavy chemical fertilizers may speed the natural process of microbial organisms, they also leave toxic residues of salts and increase acidic conditions. Yearly applications of lime, along with gypsum, can "sweeten" acidic soils, or raise the pH level (making it more alkaline), and help leach out these salts. However, regular testing of acidity levels (with inexpensive kits) and soil samples (by agriculture labs) is essential before make any substantial attempts to change the structure of your soil, whether by lime or sulfur.

A general rule for producing good sandy loam in middle Tennessee that is alive with working organisms is the rule of "thirds"—1/3 sand, 1/3 native soil (containing clay), and 1/3 organic material (peat moss, well-composted manure or lawn clippings, etc.). With annual additions of 4"-6" of good mulch, such a soil composition should be stable, long-lasting, gradually improving in structure and fertility, and requiring less harsh chemicals that build-up harmful acids and salts. This soil should hold water well, yet drain sufficiently to bring life-giving air into the roots, allowing them to pull nutrients into the plant, and with sunlight, creating healthy abundance of sugars, starches, foliage, and yes, blooms.

**If you want to have these results, you must not compromise on yoursoil!**