

SOIL RESTORATION WITH COMAND

Life Soils is a recognized leader in organics recycling and is focused on the beneficial reuse of organic materials and their biological conversion and stabilization through a proprietary composting process. Our unique COMAND products provide vitally important organic matter and microbiology to the soil, resulting in a balanced and functioning soil ecosystem.



Living in a highly sensitive environment, with intensifying population pressures on water resources, more regulation on pollution control and ever-increasing public awareness of the detrimental effects of chemical use, Life Soils strives to provide a more eco-friendly, sustainable alternative in the establishment and maintenance of beautiful landscapes.

Introduction

Land development practices severely damage the long-term ability of our urban soils to absorb and store water and hold nutrients. As a result of deliberately removing topsoil and compacting subsoils during construction activities, installed sod and landscape plantings struggle to establish deep root systems and require frequent

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supplemental irrigation and fertilizer applications to remain viable. The way water moves is altered, infiltration of rainfall into the soil is greatly decreased, while the portion that runs off the landscape to storm-drains and ultimately into our rivers, lakes, and wetlands, is significantly increased. Urban runoff picks up a variety of contaminants and nutrients along its flow path to the waterbodies that receive it, which negatively impacts water quality.

The Objective

Enable policy makers, communities, planners, developers, contractors, and landscape architects to understand the importance and urgent need for **post-construction soil standards**.

It's Time for a Change

As Florida's population continues to grow, the need for housing increases and the demand for water, a finite and precious resource, exceeds our supply. Currently, well over half of all potable water goes towards residential landscape irrigation. By 2035, there is projected to be a 400 million gallon per day deficit in supply to meet demand. We cannot simply ignore this water shortage crisis, or the other negative environmental impacts associated with conventional land development practices.

The Goal: Healthy Soil Under Every Landscape

Healthy soils are going to prove critical to conserving water, protecting watersheds, and safeguarding our natural environment. Recycled organics (Compost), can address several of society's vexing challenges, close the green loop, help mitigate against climate change, and deliver sound environmental stewardship.



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Current Florida Land Development Practices

Conventional land development practices clear and regrade large sections of the landscape. As construction begins, topsoil is removed and fill material, that was previously located well below the land surface, is commonly imported from cut areas, such as retention basins. The primary function of the fill material is to provide a stable base for the building foundation. Sandy soils tend to be the preferred lot fill.



Unfortunately, the ideal parameters for supporting roads and houses are very different than the ideal parameters for a healthy soil that supports vibrant plant growth. Sandy subsoil is largely inert, having very limited capacity to hold water or nutrients, is devoid of organic matter and beneficial soil microbes, and it compacts readily, resulting in poor aeration and reduced root penetration. The outcome, unhealthy landscapes that are difficult and expensive to maintain, excessive water use, excessive fertilizer use, and increased surface-water runoff and erosion. We should all be aware that the choices made during construction and landscaping projects can impact soil functions for decades.

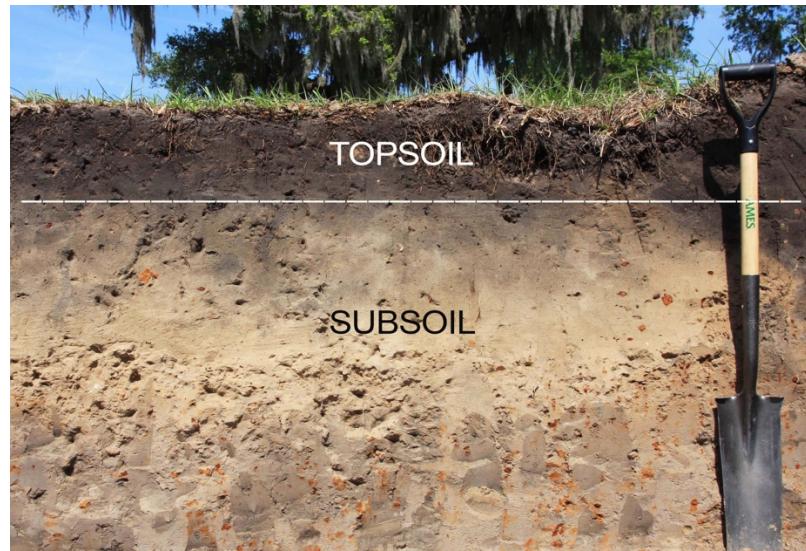
What is Healthy Soil and Why Does it Matter?

Healthy soil performs valuable functions that we often take for granted. A highly complex system, containing organic matter (humus) and teeming with billions of bacteria and fungi that are the foundation of an elegant symbiotic ecosystem.



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Healthy soils are essential for protecting watersheds. Naturally occurring (undisturbed) topsoil and vegetation provide important stormwater functions: water infiltration: nutrient, sediment, and pollutant adsorption; sediment and pollutant biofiltration; water interflow storage and transmission; and pollutant decomposition.



These functions are largely lost when development strips away native topsoil and replaces it with compacted subsoil. In essence, altering the site's hydrologic characteristics by converting the predominantly subsurface flow to primarily overland flow.

Unfortunately, current landscape ordinances practices, do not require adequate preparation of planting bed areas to regain the water holding and plant growth benefits of pre-construction soil. Without the implementation of soil amending practices, compacted soil can take several years to a couple of decades to recover any of the beneficial infiltration and water storage characteristics of the pre-developed condition.



What is Soil Amending?

This technique entails completing an appropriate level of soil improvement on landscaping and construction projects to both improve the establishment and survival of plants, while also changing the soil structure enough to better manage "too much" and "too little water". In essence, creating a healthier soil that will allow for reductions in irrigation water usage, reduce surface-water runoff, and help reduce the need for chemical inputs.

COMAND the Sustainable Solution

The most efficient way to amend post construction soils is to add COMAND to the surface of the soil and then mix (roto-till) it to a depth of six inches.



COMAND is an incredibly versatile product, containing an abundance of organic matter and beneficial microbiology, two critical components missing from post-construction soils. Amending disturbed soils with COMAND instantly re-establishes a healthy functioning soil ecosystem.

- Improved soil structure, porosity, reduced compaction, creating a better plant root environment.

- Increased infiltration and storage of water, reduced irrigation needs.
- Increased nutrient holding, filtration of sediments, and biological decomposition of pollutants.
- Allows plants to utilize nutrients more effectively, holding them in the soil longer.
- Supplies organic matter, assists in soil aggregation, and buffers soil pH.
- Supplies beneficial microorganisms and aids their proliferation.
- Improved plant growth, disease resistance, and overall aesthetics of the landscaping.
- Reduced need for (or elimination of) pesticides and fertilizer inputs for plant maintenance.

COMAND – THE SOIL SPONGE

"For every 1% increase in organic matter content, a cubic foot of soil can hold an additional 1.5 quarts of plant-available water".

(Sullivan, 2002)

"16,500 gallons of water per acre foot"

Climate Change - Fight Back with Compost

Life Soils compost products are processed from recycled organic materials such as yard waste, food scraps, residuals, and agricultural crop residues. Diverting these materials from landfill significantly reduces methane emissions (a potent greenhouse gas).



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Furthermore, utilization of these converted products leads to additional climate change benefits through carbon sequestration in soil. Increasing soil organic carbon via organic inputs is a key strategy for increasing long-term soil carbon storage and improving the climate change mitigation and adaptation potential of soil systems.

Implementing Post-Construction Soil Quality Standards

Education is Key - Many contractors and developers are unaware of or disinterested in the significant long-term economic and environmental impacts of common construction practices. Therefore, any effort to improve soil quality and urban hydrology must include a persistent education component. Homebuyers need to learn that amending soils with compost can substantially reduce long-term maintenance costs associated with irrigation, fertilizer, and plant replacement. Planners need to understand that restoring soil function will pay off in more effective and less expensive stormwater management systems. Builders need to know the direct cost savings of applying these practices such as easier planting, better initial plant growth, fewer callbacks to replace dead plants, and happier customers who will sell the next job.

Development of Standards

The following information and example language is provided as a guide for the development of local standards/ordinances and can be used as a starting point for writing codes or contracts. Local entities may choose to implement a certification program to certify that sites, homeowners, or contractors have met specifications such as these.

All areas subject to clearing and grading that have not been covered by impervious surface, incorporated into a drainage facility, or engineered as structural fill or slope shall, at project completion, be

amended with compost prior to landscape plant and/or sod installation.

Exemptions to consider include:

- Areas within the drip line of existing trees where tilling may damage roots.
- Histosols (muck soils) with high organic matter (non-mineral).

Ideally, the post-construction soils should be improved with compost to raise Soil Organic Matter (SOM) levels to 4-5%.

Essentially, restoring a topsoil layer with a minimum organic matter content and moisture holding capacity closely matching the original undisturbed native soil.



Amend existing site soil either at **default "pre-approved" rates** detailed below, or at custom calculated rates based on tests of the site soil. "Organic matter" can be determined in a soil laboratory by measuring soil weight loss after burning (called the Loss-On-Ignition test). Organic matter is expressed as a percent by weight.

- Apply a layer of COMAND to the surface of the existing soil at the pre-approved amendment rate of four (4) cubic yards per 1,000 square feet, which is a depth of 1.3 inches.
- Rototill COMAND into soil to a depth of at least six (6) inches.



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Compost Quality Standards

COMAND is produced through the utilization of a precise proprietary inoculum, an exclusive composting process known as the Modified Static Aerobic Pile (MSAP®) method, and enhanced curing and reinoculation techniques.

COMAND is certified by the U.S. Composting Council's Seal of Testing Assurance (STA) Program. The STA Certified Compost Program is founded on highly researched compost testing methods, and careful lab oversight to give you confidence the test results are accurate for the product you purchase through the STA Program. Compost manufacturers participating in the STA Program are held to high standards for using quality labs, testing frequently, disclosing specific information about their product, and following regulations.



Practical Instructions for Amending Post-Construction Soils

Preparing the Area to be Amended

1. Soil amending should not occur until all on-site construction traffic has ended. All building construction, including outdoor pavement, and installation of major utilities should be completed. Ideally, installation of irrigation lines and components should occur after amending is complete to avoid risk of damaging irrigation lines during tilling.



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2. The soil surface should be graded smooth and free of any construction debris, or trash.
3. It is recommended that irrigation components, irrigation installation equipment, and sod be staged on-site in preparation to install irrigation system and lay sod as soon as possible after amending the soil.

Applying COMAND to Disturbed Soils

1. Using a small front-end loader or spreader, COMAND should be spread evenly over the surface (Figure 1) at the prescribed rate of 4 yd³ / 1,000 ft², which is a depth of 1.3 inches.
2. Level out any shallow or deep COMAND areas to ensure even depth (Figure 2). No areas of bare soil should be visible.
3. When using COMAND, it is not necessary to add fertilizer as nutrients in the product are adequate to aid in the establishment of landscape plantings.
4. Retain copies of receipts for COMAND (volume yd³) delivered to the site, as they can be used during inspection to verify post-construction soil standards have been met.



Figure 1.



Figure 2.

Incorporation of COMAND

1. Using a rotary tiller, incorporate COMAND to a depth of 6 inches into the soil (Figure 3).



2. The bottom of the tiller should be 7-8 inches below the top of the COMAND layer.
3. Avoid tilling deeper since this risks damage to utilities (e.g., water lines, electricity, cable, etc.).



Figure 3.

After COMAND Incorporation

1. No vehicle traffic shall be permitted once incorporation is complete as this can recompact the amended soil.
2. Install irrigation lines and components. Then rake the amended surface to ensure it is level and to grade.
3. Install sod and landscape plantings as soon as possible after amending to avoid erosion or washout from unexpected rain events.
4. Mulch all landscaping beds with 2-4 inches of woody mulch, pine bark nuggets, or pine straw.

Benefits of Soil Amending with COMAND

For Builders, Developers, and Landscape Contractors

- Better landscape appearance = happier customers, which sells the next job
- Better erosion control
- Better stormwater management
- Easier, faster plant installation in amended soil

- Much better plant survival (fewer callbacks for dying plants and lawns)

For Property Owners

- Easier landscape maintenance.
- Up to 50% less irrigation needs = lower water bills.
- Less need for fertilizers and pesticides - healthier for families.
- More attractive landscapes.
- Higher property values

For the Environment

- Better stormwater detention and filtration = reduced runoff
- Increased groundwater recharge
- Bio-filtration of urban pollutants
- Better water quality
- Better habitat for wildlife and people

Plant Right for Your Site

After building healthy soil to conserve water and protect the environment, it is equally important to choose plants that need less water, have few pests, provide ecological services, and thrive in the Florida climate. Native flowers, grasses, shrubs, and trees are the logical choice and landscape ordinances should be developed to favor such species.

Together We Can Create a Better Future

Increasing the adoption of sustainable landscape practices will help create a more vibrant, healthy, and sustainable future for all Floridians. At Life Soils we endeavor to provide the highest quality compost products, technical know-how, and practical assistance in achieving this goal. Have questions? Then give us a call or email us today.

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