



# HINKSON CREEK URBAN RETROFIT PROJECT

## SUNRISE ESTATES STORMWATER NEWS



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### Improving Lawn and Landscape

University of Missouri Extension

Poor soil is a common cause of failure to grow vigorous, attractive lawns, trees and shrubs. Topsoils vary greatly from one location to another. Topsoil's ability to support plant growth can differ from block to block and from the bottom to the top of a slope.

When topsoil is eroded, removed or buried during construction, growing plants in the remaining soil can become more difficult. How well the soil is conserved and improved largely determines whether plants will become established and grow vigorously, or if they will even survive.

#### Improving Soils

**Lawn and gardens** will be in place for many years. While a garden may be fertilized later, the lawn becomes difficult and often impractical to dig up after it is established.



Dark color and crumbly texture may indicate good soil but are not a guarantee that the soil contains all the necessary nutrients. Have soil tested before planting so that nutrient deficiencies and pH may be corrected. After receiving the soil test results,

apply the recommended amounts of fertilizers and soil amendments (lime, elemental sulfur) and work them into the top 6 inches of soil.

Organic matter is very important to successful plant growth. In general, Missouri soils have about 2.5 to 3 percent organic matter. Soils with at least 2.5 to 3 percent organic matter are preferable for growing lawns. Flowers, gardens and landscapes will do well in soils with 4 to 6 percent organic matter.

Adding organic matter to the soil improves the soil's structure, aeration, water- and nutrient-holding

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capacity, root penetration and workability. Spread 1 to 3 inches of peat or compost over the soil when other nutrients are added, and work all of this into the existing soil to a depth of about 6 inches.

In addition to incorporation into the soil, applying organic matter as mulch is beneficial for many flowers, vegetables, trees and shrubs. Top-dressing of lawns may be done with good topsoil or topsoil-organic material combinations to smooth out irregular areas in the lawn or help decay thatch. Adding a few inches of topsoil does not generally improve the texture or performance of heavy clay and poorly drained soils unless it is done in combination with core aeration.

#### Trees and Shrubs

**Selection** - Select trees and shrubs that are adaptable to existing soil conditions. Know whether a plant requires well-drained soil, is drought tolerant, or is water loving.

**Planting** - When planting trees and shrubs, dig generous planting holes shallow and wide. In heavy clay soils, planting trees and shrubs a few inches above the grade of the surrounding soil is preferable. In extreme cases, mound planting is preferable, as it can help with root development above existing compacted soil.



## Soil Testing Your Lawn

University of Missouri Extension



Soil testing provides an estimate of the available nutrients in the soil and will help correct nutrient deficiencies, avoid excess fertilizer applications and maintain a healthy lawn.

A soil test (pH, neutralizable acidity, phosphorus, potassium, calcium, magnesium, organic matter, and cation exchange capacity) is recommended:

- Before establishing a new lawn
- Every three years on established lawns (late summer)
- Annually when attempting to correct a nutrient deficiency or change the soil pH
- When fertilizers containing phosphate or potash have been used on a regular basis for a number of years

### Soil Test Report

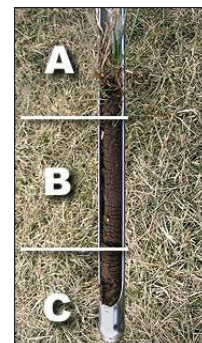
After processing your sample, the testing lab will send you a soil test report. Analyses in the following areas are usually included:

- **Soil pH** is a measure of the acidity or alkalinity of the soil. A pH of 7.0 is neutral, less than 7.0 is acid, and greater than 7.0 is alkaline.
- **Phosphorus (P)** shows the amount available to plant roots from the soil.
- **Potassium (K)** plays important roles in enhancing turfgrass stress tolerance (i.e., drought, heat, wear, disease) in addition to its essential roles in plant growth.
- **Calcium (Ca) and Magnesium (Mg)** are rarely deficient in Missouri soils.
- Soils with 3 to 6% **organic matter** will have better structure and resistance to compaction, and improved water- and nutrient-holding capacity.
- **Cation exchange capacity (CEC)** is a measure of your soil's capacity to hold nutrients; specifically K, Ca, and Mg. Clay and organic matter contribute to cation exchange capacity; thus, soils with high CEC will retain nutrients better than low-CEC soils.
- **Nitrogen (N)** is required in the highest quantity for

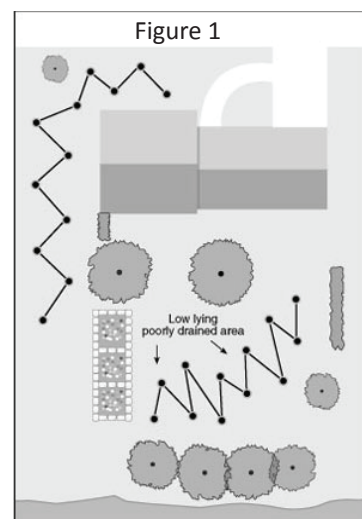
the maintenance of a healthy lawn. Soils generally contain large amounts of nitrogen, but it is not a stable element in the soil and is not normally tested by soil testing labs.

### Taking a Soil Sample

- Using a small shovel or soil probe, sample to a 4-inch depth on established lawns or, before seeding, to a 6-inch depth.
- Take 12 or more random cores from each area of the lawn to be tested and remove the thatch and live plant material before breaking up the cores and mixing thoroughly in a dry plastic bucket. (Metal buckets contaminate the sample with micronutrients.) Take random samples from the lawn as a whole unless there is a need to sample problem areas separately (Figure 1).
- Air dry the sample overnight before sending box (1.5 to 2 cups) for analysis.



If your lawn has areas with distinctly different soil conditions that need to be considered separately, collect soil samples from each area (at points in a zigzag pattern).



The MU Extension Center charges \$10 per test, and has soil sample boxes available for use at no charge. One box (1.5 to 2 cups) is all the lab needs for analysis. Submit your sample with the Soil Sample Information Form from the MU Extension Center or on the web at <http://extension.missouri.edu/explorepdf/miscpubs/mp0555.pdf>.

Send your sample to the Soil and Plant Testing Laboratory at 23 Mumford Hall, Columbia, MO 65211.

**Don't forget the Fall 2013 Tree Planting Workshop September 21, 9:00 - 11:00 am at the shelter!**



## Rain Garden Installation in Sunrise Estates

Michael Morrison

The week of August 19th was a busy one for the Phillips and Watson families. Both property owners assisted members of the Boone County Stormwater



Management team with installing soil amendments in each of the excavated rain gardens on their properties.

During Phase I of the rain garden project sites and

cavities for gardens on each property were selected and excavated according to the Hinkson Creek Urban Retrofit Project guidelines.

After maintenance agreements with the property owners were approved by the Boone County Commission, work on Phase II of the project began with the delivery of three different soil amendments and a load of hardwood mulch.

The three types of soil amendments included an 80-10-10 mixture of 80% sand, 10% compost and 10% topsoil. A 50-50 mix of sand and compost made up the second amendment while a 50-50 mix of compost and topsoil made up the third and final amendment type.



The six rain gardens (four on the Phillips property and two on the Watson property) were each filled with 12 inches of amended soil. Two of the rain gardens received the 80-10-10 mix; two were backfilled with the 50-50 sand and compost mix while the remaining two received the 50-50 compost and

soil mix. Gardens were randomly selected for mix types based on applicable monitoring criteria.

After the garden cavities were filled with the amendments, a three inch layer of hardwood mulch was applied to each garden bringing the total material in each to 15 inches of amended soil and mulch.

Once the mulch was applied, each garden received a surrounding layer of native soil (on site soil) as a



berm to increase the ponding of each garden. Berms enhance the gardens' infiltrating effects.

Each garden berm was seeded and strawed to prevent erosion of the berms. After two

days of concentrated effort all six rain gardens are ready for the final planting of native plants (Phase III), which is scheduled for mid-September.

Some of the native plants scheduled for planting include: Copper Iris, Fox Sedge, Sweet Coneflower, Cardinal Flower and Southern Blue Flag.

The Hinkson Creek Urban Retrofit Project wishes to thank the Phillips and Watson families for their participation and continued support in making the first six rain gardens in Sunrise Estates a reality. These water quality



features should aid in addressing the subdivision's stormwater runoff issues by slowing the rate of runoff and allowing stormwater to infiltrate the ground in a manner that benefits not only the rain garden but surrounding properties as well!

Practice	Goal	# Installed/planted
Rain Barrels and/or Rain Gardens	45	43
Community Stormwater Features	3	0
Tree Plantings	60	26

## Meet the Boone County Stormwater Management Team



l.r. Bill Florea, Nicki Fuemmeler, Catherine Beatty and Michael Morrison

**Bill Florea** is a Land Use Planner and stormwater policy advisor for Boone County. Florea was the primary author of the Boone County Stream Buffer Regulation and has managed two watershed planning efforts for Boone County including the Bonne Femme and Hinkson Creek watersheds. For over 20 years Bill has been involved professionally with stormwater and environmental issues across several jurisdictions including Boone County, MO; King and Whatcom Counties in the State of Washington.

**Nicki Fuemmeler**, a native of Boone County, has been the Stormwater Coordinator for Boone County since December 2012. She is responsible for developing and implementing the county's Stormwater Management Program. Prior to her current assignment Nicki worked as the county's Stormwater Educator and as the stormwater manager for a local heavy construction company where she developed and managed erosion and sediment control programs. Nicki holds a B.S. in Agriculture Education, with an emphasis in Leadership and Communication.

**Catherine Beatty**, the county's Urban Hydrologist, has over eight years of water quality, aquatic ecology, environmental regulatory and natural resource monitoring experience. Prior to joining the stormwater team Catherine worked for the National Park Service, Indiana Department of Transportation and KCI Technologies, Inc. Catherine holds a B.S. in Environmental Science and an M.S. in Biological Sciences.

**Michael Morrison**, the county's Stormwater Educator, has over 30 years professional experience in government and education. He holds a B.A. in Political Science along with an MPA in Organizational Development and Leadership.



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