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Features

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Slow it Down, Spread it Out, Soak it In

Dr. Richard Ludwig

“The most destructive force in the world is the raindrop!” our instructor began as we applied for our Erosion Sediment Control Certification.

Water can destroy foundations, rot wooden structures and create mold and mildew problems. Lawns and sports fields are unusable, even dangerous, when too much water is present. Let water sit on our typical landscape plantings even for a few days and see what happens.

It is easy to see why the conventional approach to stormwater has been, “This is a problem. Let’s make it go away.” Sending all stormwater, sewage and industrial pollutants into the nearest river or stream has been standard operating procedure for decades. It solved the immediate problem but did enormous long-term damage downstream.

Clearly, it’s time for a change. Sustainable stormwater management starts off by celebrating the water’s goodness and importance. And, words matter. As mentioned, the term “stormwater” is perceived as something negative to be dealt with so people can use the space. How about rainwater versus stormwater—a much more affable, environmentally friendly connotation. By the way, did you know the delicious ocean fish Orange Roughy was originally called Slimehead? Yes, words do matter!

A Sustainable Approach

The authors of “Artful Rainwater Design” do a great job of explaining what a sustainable approach means: “We want to manage rain in ways that protect and provide for human and natural systems. Sustainable means we emulate natural hydrological systems, focusing on the small storm runoff, not just the 10-year floods. We concentrate on ‘first flush’ and do everything we can on site. It means not expecting local or regional entities to solve this problem. Clearly, this approach celebrates rain!”

An example of a rain garden.

People buy our green industry products and services, so our actions need to be human-centered as well as eco-smart. Key point: If we want sustainable practices to be lasting, they must be acceptable—no, beautiful—to the folks

who use them on a daily basis. If these designs are considered ugly, scruffy or unsafe, they won't last. There must be a sense of meaning, a sense of pride in these efforts.

This means focusing on more than just capturing and using the water that hits the site. Truly sustainable spaces must be functional on many different levels, delivering multiple benefits to multiple entities. There should be no apology for making these designs delightfully people-centered as well as good for the planet.

How do we do it? The simple answer is "Slow it down, spread it out, soak it in … and celebrate the process!" This means implementing multiple, small, redundant systems that won't fail. The best place to start? Right where the raindrop lands—such as a roof.

Hardgoods Options for Management

A super way to capture and use rainwater is with rain barrels. They collect and store rainwater from rooftops for irrigation or other non-potable uses. This reduces the volume of rainwater entering drainage systems and conserves water. A smart addition is a first flush diverter. This device channels the initial flow of rainwater away from the barrel to improve water quality by removing roof debris and contaminants. It's also known as a roof washer or stand pipe, and is designed to capture and discard the first portion of rainfall often containing the most dust, leaves, bird droppings and other debris accumulated on the roof since the last rain.

Rain barrels are utilitarian, but they need to look like they belong and match the architecture. A wooden barrel for a ranch or terracotta for brick is perfect. Not interested in a visible container? Consider a cistern or water bladder. These units can store hundreds or even thousands of gallons of water. They're easy ways to create sub-surface water storage reservoirs. I've actually seen them in crawl spaces, greenhouses and storage buildings. The simplest way to get started is to purchase a kit that comes with a EPDM liner/bladder, underlayment, and connectors for your gutters. A variety of sizes allow you the flexibility to choose the reservoir size that best suits your application.

The biggest runoff problems exist when rainwater hits a solid surface such as concrete or asphalt. Consider permeable concrete, pavers, gravel or some type of infiltration surface. Pervious concrete is much like a Rice Krispy Square. It's solid like regular concrete, but it allows water to infiltrate directly into the soil beneath and helps lower the temperature of the surrounding area. The recipe for this material is simple: Portland cement and pea-size gravel, and no sand. This creates a porous material that allows significant infiltration. Key point: Keep it clean to keep it working. Otherwise, dirt and debris clog up the spaces and render it useless.

Livegoods Options

Plants do an incredible job of soaking up and slowing down rainwater, so consider creating a bioswale. These are shallow, vegetated channels that slow and filter rainwater flow. They work particularly well when dealing with a slope or when you want to slow the flow of runoff water. Because moisture levels vary from bottom to top in a bioswale, lots of different plants can be used. Focus on species that can withstand fluctuating moisture levels, including alternating flooding and dry periods. Native plants are highly recommended because they're adapted to local climate and soil conditions, require less maintenance, resist pests and provide habitat for wildlife. Consider soil type, sunlight exposure and the specific hydrology of your site to ensure plant survival and functionality.

An example of a bioswale.

Let's not forget rain gardens! These shallow, planted depressions capture and infiltrate rainwater from roofs,

driveways and landscaped areas. They do a fabulous job of filtering pollutants like fertilizers, pesticides and sediment using vegetation and layers of soil. They're really a big sponge that reduces runoff and recharges groundwater. Consider them as the final destination of that raindrop after other redundant components have been added. The plant material is pretty much the same as for a bioswale. Grasses lead the list due to their deep, fibrous root systems. This prevents erosion and enhances water filtration. The ones listed in the sidebar all thrive in wet to moderately dry soils and offer aesthetic appeal with fine texture, graceful foliage and seedheads. Next are wildflowers and herbaceous perennials. Adding flowering plants improves pollinator habitat and visual appeal. These recommended species tolerate wet soils and provide multiple seasons of interest while supporting local wildlife. Large shrubs and trees can add enormous interest, scale, wildlife habitat/food and shade to cool the ground below. See the sidebar for a full list of options for rain gardens.

Rather than getting rid of stormwater, let's celebrate rainwater! Combining these strategies can significantly mitigate flooding, reduce pollution and support local ecosystems … in a beautiful and sustainable way. **GP**

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Options for Rain Gardens & Bioswales

Grasses:

Switchgrass (*Panicum virgatum*)
Big Bluestem (*Andropogon gerardii*)
Prairie Dropseed (*Sporobolus heterolepis*)
Little Bluestem (*Schizachyrium scoparium*)
Virginia Wild Rye (*Elymus virginicus*)
Indian Grass (*Sorghastrum nutans*)

Perennials:

Purple Coneflower (*Echinacea purpurea*)
Black-eyed Susan (*Rudbeckia hirta*)
New England Aster (*Symphyotrichum novae-angliae*)
Swamp Milkweed (*Asclepias incarnata*)
Joe Pye Weed (*Eupatorium maculatum*)
Tall Ironweed (*Vernonia altissima*)
Golden Alexanders (*Zizia aurea*)

Shrubs & Trees:

Rose Mallow (*Hibiscus moscheutos*)
Buttonbush (*Cephalanthus occidentalis*)
Winterberry (*Ilex verticillata*)
Arrowwood Viburnum (*Viburnum dentatum*)
Dogwood (*Cornus spp.*)
Swamp White Oak (*Quercus bicolor*)
Riverbirch (*Betula nigra*)