



MONMOUTH COUNTY PARK SYSTEM GREEN HERITAGE

The Newsletter of Monmouth County's Open Space, Parks & Recreation Agency

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Slide, Surf, Hike, Paddle, Ride, Learn, Experience ... ALL IN A COUNTY PARK

The program staff in the Park System's Visitor Services division select the line-up of classes, programs and activities offered in the county parks each season. Their choices are based, in part, on some of the county's unique recreational resources.

Special Settings Turn the Ordinary into Extraordinary

Because of its many special facilities & resources, the Monmouth County Park System is able to offer many authentic outdoor and nature programs which aren't available anywhere else nearby. Summer camps, for instance, include bicycling, hiking and camping because there are paved trails, nature trails and cabins/campsites in the county parks. Fishing, boating (canoe/kayak), surfing and sailing programs are offered at the county's many waterfront parks. And, if its bird or plant identification, or gardening you're into, the county's many meadows, fields and gardens offer the perfect setting.

In addition to offering many different ways to get outside and enjoy area wildlife and wide-open spaces, park staff are constantly on the lookout for new ideas to create programs that will delight park visitors, teach a new skill, or simply help people get the exercise or outdoor time they need to relax and stay healthy.



Summer campers love learning to surf at Seven Presidents Oceanfront Park.



These campers certainly were Wild About Bugs as Park System Naturalists made learning about a variety of insects fun.



Learning the safety and skills necessary for backpacking with the Outdoor Adventures division.



With a wide variety of fitness classes offered year-round at various locations, we're always ready to help you reach your goals!



Historic Longstreet Farm offers a glimpse into Monmouth County past as staff dressed in period clothing perform a variety of seasonal chores, such as plowing the fields, planting the garden, feeding the animals, or even cooking meals.

Continues next page...

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Bayshore Waterfront Park's Summer Seining utilizes its location on the Sandy Hook Bay to teach children what lives in our local waters.



Getting in touch with your artistic side is easy at the Creative Arts Center, offering classes for both children and adults.



For those interested in learning to play golf, classes ranging from beginner to advanced are offered from spring through fall.



Learning to cook is easy as instructors teach delicious recipes along with kitchen safety.

Comparing Local, County and State Parks & Recreation

While most towns have local, neighborhood parks developed for recreation (think ball fields, playgrounds, and basketball courts), the state focuses on large, expansive tracts of land of state significance that remain largely undeveloped. The county does both.

Like the state, the Monmouth County Park System preserves large tracts of county land for open space and wildlife/watershed protection, that helps shape development. The county also provides for many different types of recreation. This means that residents can enjoy the wide-open spaces nearby and they can also access these spaces for exercise, hobbies, or just a breath of fresh air.

County park and recreation facilities meet regional priorities.

There are sites within 20 minutes driving distance of most county residents—such as Turkey Swamp Park in Freehold—where you can do many different activities.



The largest county park at over 2,100 acres, Turkey Swamp Park offers soccer fields, playgrounds, trails, campgrounds, rental boats, picnic shelters and many more recreational opportunities while preserving open space.

Special Facilities in Monmouth County's Parks

The county also provides facilities that may fall outside the resources of individual towns. Here's just a sampling of some of the county's specialized recreational facilities:

Unique Playgrounds in Monmouth County

- Skateplex at Seven Presidents Oceanfront Park
- Two barrier-free playgrounds for children of all abilities: Challenger Place at Dorbrook Recreation Area and Tony's Place at Seven Presidents Oceanfront Park
- Sprayground (water playground) at Dorbrook Recreation Area

Sports Facilities for School Teams

- Golf courses for local golf teams
- Tennis courts for local tennis teams
- Holmdel Park, a nationally recognized cross-country course widely considered to be one of the best outdoor running courses of its kind on the East Coast

Sites for Hands-on Environmental & Nature Education

- Huber Woods Park (Reptile House, Lenape Indian programs & displays)
- Manasquan Reservoir (wetland education programs, boat tours)
- Bayshore Waterfront Park Activity Center (bayfront/estuary activities like seining)
- Seven Presidents Activity Center (classes feature ocean and marine life)
- Fisherman's Cove Activity Center (bird, wildlife and nature walks by the Manasquan River)



The Skateplex is the perfect spot for beginners to learn skateboarding in a safe and nurturing environment.



Park System Naturalist led boat tours of the Manasquan Reservoir offer beautiful scenery and opportunities to view local wildlife each summer.



The beauty and serenity of Deep Cut Gardens, open daily year-round.

Areas to Enjoy Specific Activities

- Four historic sites that preserve the county's rich agricultural and cultural past (Historic Longstreet Farm, Historic Walnford, Battery Lewis and the Navesink Military Reservation, and Historic Portland Place)
- A horticultural park and library at Deep Cut Gardens
- An oceanfront site (Seven Presidents), riverfront sites (Hartshorne Woods Park, Shark River Park, Swimming River Park, and Fisherman's Cove), and bayfront sites (Bayshore Waterfront Park and Popomora Point)
- Sunnyside Equestrian Center for therapeutic horseback riding
- Beautifully maintained family and group campsites and cabin rentals at Turkey Swamp Park
- Dozens of sites to go boating and fishing; two with boat rentals
- Full-service Monmouth Cove Marina
- Creative Arts Center at Thompson Park, a state-of-the-art fine arts facility

This article was formulated from an article that originally appeared in the Winter 2010/2011 Green Heritage.

Managing Invasive Species In The Monmouth County Park System

R.J. Curcio, Certified Associate Ecologist, Environmental Specialist

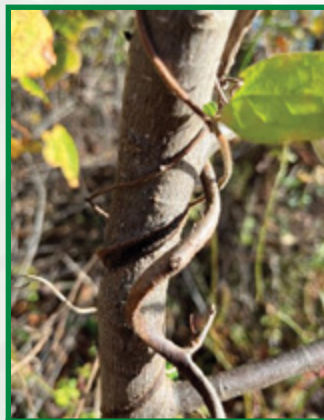
What are Invasive Species?

The recent population boom of the spotted lanternfly has made Monmouth County residents increasingly aware of invasive species. However, the spotted lanternfly is just one example of dozens of invasive species the county faces. An invasive species can be any organism introduced by humans to an ecosystem, including plants, animals or even microscopic organisms like bacteria.

Not every non-native species is invasive; some non-native plants like common garden vegetables will grow without causing harm. A species is defined as invasive based on its negative impact to the local ecology, the economy, or human health. For example, poison hemlock (*Conium maculatum*) is a species that hits all three criteria. It was intentionally introduced from Europe as an ornamental plant in the late 1800s and over time spread into our fields and pastures. Not only does this species harm our ecosystem by outcompeting the native plants that belong here, but it is also poisonous to both humans and livestock, making it a potential threat to our health and economy. Invasive species arrive in Monmouth County in many ways through our complicated global trade networks such as from ship ballasts and packing materials. However, invasive species have largely been introduced intentionally through the ornamental plant industry or even various agencies of the past who, at the time, did not realize the consequences of their actions.

Why Manage Invasive Species?

In their native range, invasive species have natural “checks and balances” such as competition, pests and pathogens that prevent them from dominating the habitat. When introduced to a foreign environment, invasive species do not have those natural checks and balances. As invasive species spread through the environment they can outcompete the native species for resources, alter soil chemistry, alter hydrology, reduce biodiversity, and can even directly harm our native species.



Invasive Asian bittersweet (Celastrus orbiculatus) girdling a native tree at Thompson Park.

Native plant diversity is the basis of our entire ecosystem. Many of our native insects including pollinators, like butterflies and moths, co-evolved over thousands or even millions of years with our diverse native plants and require very specific groups of plants or even a single species as a host (a host being a plant or group of plants an insect requires at some stage in its life, often in its larval stage). Many people are familiar with the monarch butterfly and the importance of its specific host, milkweed (*Asclepias*). Monarch butterflies are just one of many species that have their own special host requirements. When we allow a single invasive plant species to dominate our environment over the diversity of native species that belong there, we lose many of the insect specialists that depend on plant diversity. Declines in our insect diversity result in declines in other wildlife species and make our forests, farms and community less resilient to environmental changes in the future. To bring balance back to our ecosystem, it is our responsibility as stewards of the land to undo the damage invasive species do to the environment through creative, scientific and minimally harmful ways.

How Does the Monmouth County Park System Manage Invasive Species?

Each individual invasive species is a unique problem that requires a unique solution depending on the size of the population, the habitat it's invading, the financial burden, as well as numerous other factors. The Monmouth County Park System uses leading scientific methods and cooperates with other public agencies, non-profits, as well as various consultants and contractors to tackle some of the most complicated invasive issues in the county.

- A very effective way the Monmouth County Park System prevents invasive species is preserving intact, healthy forests. Invasive species overwhelmingly prefer human-disturbed habitats like abandoned fields and roadsides. By acquiring and protecting healthy forests, the Park System is preventing further ecological disturbance in the county that leads to the types of habitats invasive species prefer. These healthy forests, such as the woods surrounding Doctors Creek at Clayton Park in Upper Freehold, provide a variety of ecological services and serve as an example for what native biodiversity can look like.

- One of the most effective ways of managing invasive species is called Early Detection/Rapid Response (EDRR). By identifying a potential problem early and acting swiftly, park staff can address a potential issue before it develops into a larger problem.

This is accomplished through continued education and cooperation between the park ecologist staff, naturalists, rangers, and even the public. Working together as a community has allowed us to prevent many invasions from happening in the first place.

For example, Huber Woods Park manager Scott Major noticed a plant that looked out of place and quickly contacted the environmental specialists in the Natural & Historic Resources Department.

Upon further inspection, they were able to identify the plant as Italian arum (*Arum italicum*), an emerging invasive species in New Jersey. With a single, targeted herbicide application the invasive species was managed before it developed into a large infestation.



Invasive Italian arum (Arum italicum) emerging from the forest floor at Huber Woods Park.

- For areas that already have a history of disturbance and require a larger-scale effort, an integrated pest management (IPM) approach is required. Park System staff uses a combination of mechanical, chemical, biological and cultural controls to combat invasive species effectively with the least amount of negative impact to the surrounding environment. Once restored these invaded areas often take years of follow-up to ensure the diversity of native plants that belong in the once-disturbed habitat can compete and thrive. While hiking through the many fields and forests of the Monmouth County Park System, patrons may see a restoration area that looks a little messy along with a sign like this one shown here. Just like cleaning out a closet, a restoration area is going to look worse before it looks better. However, with a little bit of help, nature heals over time and along with it a diversity of wildlife returns.

RESTORATION IN PROGRESS

PROJECT DESCRIPTION

The Monmouth County Park System is working to remove invasive species throughout Huber Woods Park. This area is heavily infested with detrimental invasive species called porcelain-berry (*Ampelopsis brevipedunculata*), multiflora rose (*Rosa multiflora*), and rugelosa (*Lonicera rugelosa*). When an invasion of this degree occurs, stewardship is required to restore healthy habitat conditions, including the mechanical removal of several plant species. Selective land clearing will take place on a 4-acre portion of Huber Woods Park during early 2023. Subsequent work planned includes herbicide applications to control any regrowth of the invasives, followed by seeding of native species. This process is repeated over many years.

REASON FOR PROJECT

Invasive species are plants and animals that are non-native to an ecosystem and whose introduction causes environmental harm. Invasive plant species degrade native ecosystems by outcompeting native plants for resources such as habitat, water, nutrients, and light. Native plants are important to an ecosystem because native animals depend on them for survival. In the case of porcelain-berry, this invasive species is a climbing vine that can tangle large trees if left unmanaged. Additionally, porcelain-berry spreads quickly and creates dense mats of vegetation that cover and prevent the growth of native vegetation. After removal of the invasive species, native plants and animals can be restored to the area to protect and improve forest health.




THE RESTORATION PROCESS



Please excuse the unsightly conditions of this area while the restoration is in progress. Landscape restorations are labor-intensive and full results may not be obvious for many years. The Monmouth County Park System apologizes for any inconvenience throughout the restoration period but expects that the final results will greatly improve the park for both visitors and wildlife.



Restoration Poster for Huber Woods Park.

What Can Monmouth County Residents Do to Help?

Be a good park neighbor! Avoid planting species listed as “invasive” on reputable websites such as The Native Plant Society or Friends of Hopewell Valley Open Space New Jersey Invasive Species Strike Team. Though a plant like burning bush (*Euonymus alatus*) or Chinese silver grass (*Miscanthus sinensis*) may not seem to be causing problems on manicured, suburban landscapes, once introduced into a natural landscape by birds or wind the seeds from these invasive species can lead to large-scale infestations. If you already have those plants on your property, replace them with a native species that may provide a similar aesthetic value. Many native plants are beautiful, and you will be surprised how many more desirable species like butterflies, moths and birds visit your property once the food sources they are seeking are present. If we work together as a community, we can make our county a more beautiful and ecologically diverse place to live for ourselves and for future generations.



Monmouth County Invasive Strike Force restoring at Seven Presidents Oceanfront Park.

Want to do even more? Get involved!

The Monmouth County Park System’s Invasive Species Strike Force is recruiting volunteers to help us use the power of community to combat invasive species in our parks. The Invasive Species Strike Force tackles a diversity of issues working hand-in-hand with park staff to combat invasive species and restore native habitat. Recent accomplishments of the strike force include but are not limited to: extending the life of old-growth forests by managing invasive vines, restoring the forest edges and natural beauty around historical buildings, and increasing the health of our waterways by removing invasive species from our stream beds and pond margins. For information on becoming a volunteer, email volunteer@monmouthcountyparks.com.

Deep Cut Gardens Home Gardener

152 Red Hill Road
Middletown, NJ 07748

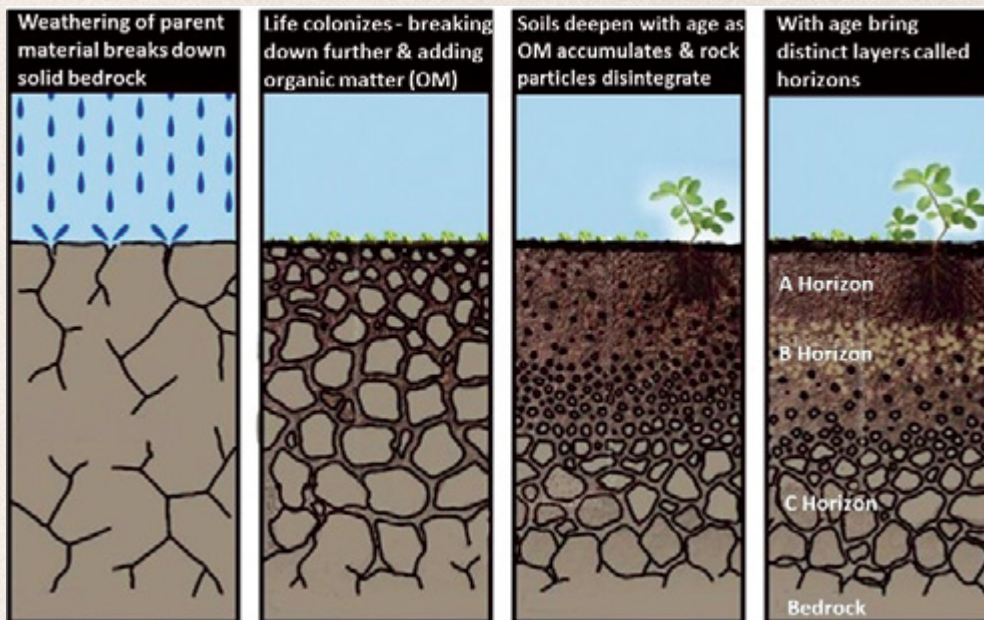
GS Parkway Exit 114, to Red Hill Road
732-671-6050

HEALTHY SOIL – The Gardener’s Strongest Ally

Kate B. Lepis, Ph.D., Horticulturist

Take some great advice from an uncle with the greenest of thumbs, “Planting a \$100 plant in a \$10 hole will get you nowhere, but you’ll have great success with a \$10 plant in a \$100 hole.” Successful gardening is all about the soil - healthy, fertile soil can grow anything. Prosperous organic gardeners view the soil as a living entity and organic farmers see themselves as growers of living soil; the focus is not on plants as one might think. How do you achieve dynamic, living soil that supports vibrant plants without chemical inputs? The first step is learning the basics about soil.

Soil is the Earth’s living skin and begins with the physical weathering of rock. As outcrops are exposed to freeze/thaw, wind and rain, smaller and smaller mineral particles break away and begin to form soil, or are transported by gravity, water/ice or wind forming deposits elsewhere. Where life takes hold the metabolic activities of plant roots, fungal filaments (hyphae), bacteria, algae, and small animals like earthworms and ants further shape the deposits into soil. Soil is not merely composed of tiny bits of rock. There are spaces between those particles where you find air, water and organic matter (life and its residues). The four components: mineral particles, organic matter, air and water determine soil characteristics like structure, fertility and drainage.



Modified from Soilsportal. <https://soils.landcareresearch.co.nz/>

A simplified portrayal of soil genesis.¹

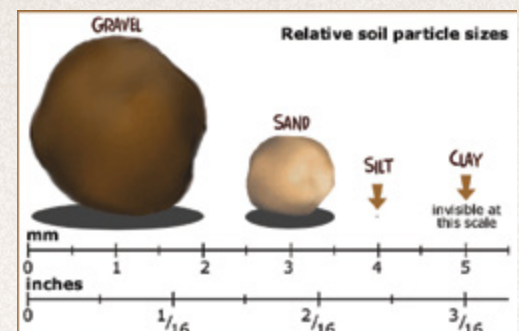
The breakdown and formation of rock and soil genesis are dynamic cyclical processes that act on a geological timescale (millions of years). The rock that gives rise to the mineral component is called the parent material. Like the parent/offspring relationship, characteristics like particle size, shape and chemical composition are inherited from parent material and have a significant influence on how soil behaves. Three particle types are recognized chiefly by their size: sand, silt and clay.



Fall color in an organic garden bed - blooming heart-leaved aster (*Symphyotrichum cordifolium*) backed by the red leaves of Virginia sweetspire (*Itea virginica*).



The spaces that exist between these jetty boulders are similar to the microscopic pores between soil particles.



The relative size of mineral particles.²

Comparing Soil Particles⁶

Particle Type & Size	Texture When Dry	Texture When Wet	Particle Stickiness
Sand – visible to the naked eye	Loose and gritty	Loose and gritty	Lacking
Silt – visible if magnified 40-100X bigger)	Like baby powder or flour	Smooth	Moderately
Clay – visible if magnified (1000+X bigger)	Forms hard stone-like clods	Sticky, pliable	Very sticky

Sand

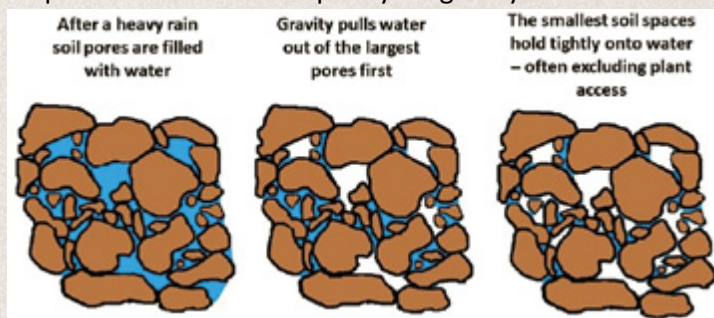
Most of us have experienced the gritty texture of sand at the beach and can probably visualize holding distinguishable grains in our hands. Think about building a sandcastle.

The dampened sand can be molded into a structure, but one that is weakly held together. All it takes is a single finger to knock it down. Any bit of stickiness holding the damp sand together is from the water itself. Unlike



Sandcastle⁴

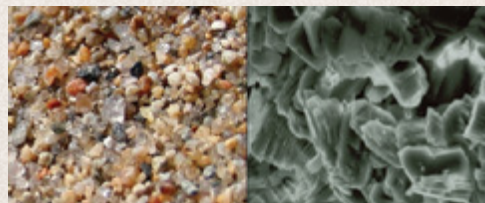
water, sand is non-polar, lacking a sticky behavior. Now think about the castle moat and the kids that try to fill it bucket after bucket to no avail. Water drains from sand quickly because sand is dominated by large soil pores that lose water quickly via gravity.



In the garden, sand dominated soils are gritty in texture and drain readily. The gardener has a relatively easy time digging and plant roots can readily grow through a sandy soil. These aspects are beneficial to plant growth. Well-drained soil minimizes the threat of root rot and improves plants' ability to access soil resources. On the other hand, the non-polar character means sand particles have an inability to "stick" to nutrients. The larger pore size and non-polar character means nutrients and water existing in the soil drain away quickly, making sandy soil dryer and nutrient poor.

Clay

In many ways clay particles are the yin to sand's yang. They are the smallest – so small individual particles can only be seen with an electron microscope. Particle shape also



Sand grains on the left and stacks of clay particles on the right.

differs – clay are thin, flat polygons that tightly stack together. With the small size and the tendency to stack, the spaces between particles

are tiny. The tiny pores hold tightly onto water preventing the water from draining away and causing water-logged soil. Clay particles are polar, sticking to each other, to water, and nutrients (charged particles = ions). This causes clay to be sticky and pliable when wet. If you stomp around in clay dominated mud you need to actively clean your boots with a strong spray of water or cloth. If your boots are covered in sand, you merely need to let them dry then gently wipe. The stickiness also gives clay a strong tendency to become compacted together. Anyone who makes pottery knows these characteristics well.

Wet clay is smooth and can be molded into a variety of shapes. Once dry the shape holds together strongly – a thick enough layer cannot be broken with bare hands, very different from a sandcastle.



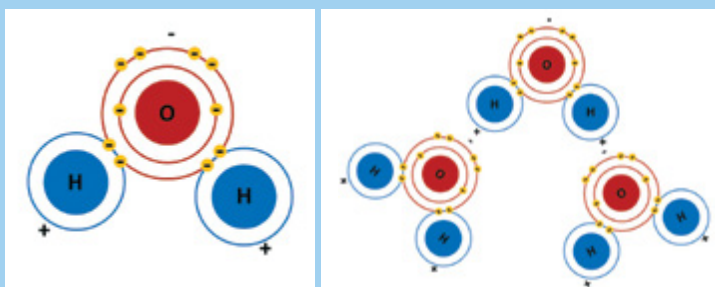
Wet clay⁴

In the garden, clay soils are higher in nutrients, but tend to be heavy, hard and water-logged after substantial rain. This is not ideal for plant growth. Here at Deep Cut the soil is dominated by clay. Dry clay soil lacking organic matter can feel like digging into concrete.

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What are Polar Molecules?

Polar molecules, like water, carry a weak electrical charge. One end is slightly positive (+) and the other end negative (-). Picture a AA battery. *Water is made of 2 hydrogen (H) atoms and 1 oxygen (O). They are bonded together because they share electrons, but not evenly. The O atom holds the electrons more closely giving that end a slight (-) charge, leaving the two H ends with a slight (+) charge.*



Opposite charges attract causing polar molecules to "stick" to



Gerris lacustris⁴

one another and to other charged particles. The polar ("sticky") nature of water creates surface tension allowing pond skaters (*Gerris lacustris*) to stand on water.

Those with clay soil should avoid working it when wet. Doing so can result in compaction forming a hard pan that is difficult to break through with a shovel. Imagine the difficulty plants have growing through compacted soil. The hard layer also acts as a barrier to rainwater preventing root hydration. Working when the soil is slightly moist is ideal because you minimize the threat of compaction, but have an easier time breaking up the soil clods softened by the presence of water.



Breaking up clay soil is laborious. Hard clods can be difficult to break apart, but doing so allows roots to access the nutrients inside soil aggregates and facilitates root growth.



Preparing a bed for planting at Deep Cut. Jumping on the shovel only allows it to penetrate the clay soil a few inches.

Silt

Silt particles are intermediate in size and character with sand and clay. Individual grains are too small to see with the naked eye but can be viewed using a light microscope. Silt adheres to itself and other things, but not to the extent of clay. Like sand, silt particles are round or irregular in shape. This allows the spaces between particles to vary in size allowing for decent water drainage. Soils that are equal parts silt, sand and clay are called loams which are favorable for plant growth. Equal parts of each mineral type help to counteract the negative attributes of each. If the mixture is dominated by sand, it is referred to as a sandy loam; clay loams are dominated by clay. As expected, the dominant particle type has the greatest influence on the soil's characteristics.

References:

¹Manaaki Whenua Landcare Research, 2023. Soilsportal, Understanding Soils. New Zealand. <https://soils.landcareresearch.co.nz/topics/understanding-soils/how-do-soils-form/>

²Utah Education Network. 2022. Sand, Clay and Humus <https://www.uen.org/lessonplan/view/33048>

³ General Biology?

⁴ Wikimedia. Creative Commons License 2.0 <https://creativecommons.org/licenses/by-nc/2.0/>

⁵Gatiboni, L. 2022. Soils and Plant Nutrients, Chapter 1. In: K.A. Moore, and. L.K. Bradley (eds). North Carolina Extension Gardener Handbook, 2nd ed. NC State Extension, Raleigh, NC. <https://content.ces.ncsu.edu/extension-gardener-handbook/1-soils-and-plant-nutrients>

⁶Brady, NC. 1990. The Nature and Properties of Soil, 10th Edition. MacMillan Publishing Company, NY, NY

⁷Koons Garcia, D. 2013. Symphony of the Soil. Documentary. <https://symphonyofthesoil.com/>

Promote Biodiversity in Your Soil

The soil pores not only hold air and water, but are home to microscopic life. Soil that is full of life is better at absorbing/storing water and recycling nutrients back to plants. Like other ecosystems, the soil performs these functions more efficiently when the life within is abundant and diverse. Before the advent of synthetic fertilizers farmers cleared forests and wild prairies, but only achieved adequate harvests the first few years. The field was then abandoned and a new one cleared⁷. The “wild” soils were fertile because of the abundance of life that was nurtured by nature’s annual deposition of organic matter (i.e. fallen leaves). Soil fertility diminished because those farmers were not feeding the life in the soil causing that to diminish.

The Law of Return states that anything removed from the soil (crops) must be returned (organic matter/ compost)⁷. Biodiversity hot spots, like tropical rainforest, exist on otherwise poor soils because the life in the soil decomposes organic matter that is continually deposited and makes those nutrients available to plants. The best way to promote biodiversity in your soil is to grow compost and apply that organic matter (OM) to your planting beds annually. Doing so improves the quality of any soil. Mixing it with sand improves the water holding capacity. The clods of OM act like little sponges holding onto water and increasing the number of smaller soil spaces. When added to clay soil it prevents the tiny particles from sticking



Adding a healthy amount of compost to a garden bed is crucial for growing healthy plants.

together creating larger soil pores, improving drainage and preventing compaction. It also prevents compaction in silty soil and decreases the chance of wind erosion by aggregating the particles into bigger, friable clumps.

READY, QUIET ON SET, ROLL SOUND, CAMERA, ACTION!

Tanya Dinova, Horticulturist & Park Ranger

Welcome to the biggest event of the year!

We are delighted to feature this amazing and colorful lineup of the Best Fall Color Plants for your garden and yard. Sit tight and enjoy the show.

Starring in the tree category are the

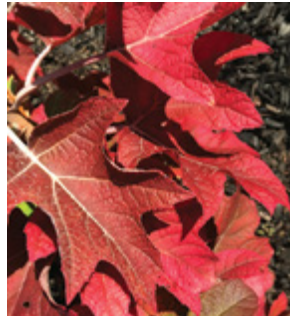
- Tulip tree (*Liriodendron tulipifera*) and ginkgo (*Ginkgo biloba*) turn a lovely uniform gold.
- Maples are famous for autumn color. All red maples turn yellow and red, but the variety "October Glory" is unmatched and was developed at Princeton Nurseries.
- Japanese maples may be among the prettiest with their wispy leaves, especially the weeping varieties.
- Black gum boasts a spectacular display of orange-red.



Ginkgo

In the dramatic color change category meet the masters of crimson leaves

- Oakleaf hydrangea (*Hydrangea quercifolia*)
- Boston Ivy (*Parthenocissus tricuspidate*)
- Sumac (*Rhus typhina*)
- Creeping wintergreen (*Gaultheria procumbens*)
- Crimson glory vine (*Vitis coignetiae*)



Oakleaf hydrangea

Bewitching blooms categorize these contenders as full of drama and rightfully so. Remember, they had to overcome and adapt to unique challenges like cooler nights, less daylight, already depleted and compacted soils, and generally harsher conditions.

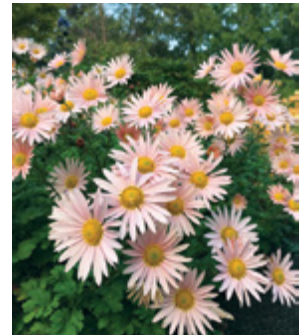
- First off meet the hardy toad lily (*Tricyrtis hirta*), drama and mystique surround this beauty queen. Its softly hairy foliage is one-of-a-kind, yet it is the orchidlike blossoms that are its crown jewel.
- Following in the shadow of the toad lily is the autumn crocus (*Colchicum spp.* and hybrids). Large, full and abundant, check-out this wine-glass shaped contender of the lily family. Bright pinks and lavender colors boasted in a bohemian crown make this a logical winning choice.



- Gently arching over, welcome the next contender: pineapple sage (*Salvia rutilans*). This fall bloomer rejuvenates the tired garden, standing tall 3-5 feet above it, with a square stem, opposite leaves and a tall, skinny floral spike which is covered with candy-apple-red flowers in autumn. It is a plant we love as much as for its scented leaves as for the flowers.
- With their own distinct behavior, the fall-blooming naked ladies (*Lycoris squamigera*) are a hoot. These brave beauties will take your breath away. They bloom undressed (without their foliage) spreading joy, confidence and whimsy. Just when you thought you have seen it all, after the colorful spring flowers and the summer blooms, the naked ladies come to wow the eyes one last time. All it takes is a soaking rain, and voilà – the crescendo of blooms quickly shoots up.



- The soft apricot flowers of Sheffield mums (*Chrysanthemum rubellum*) make a cloud of enchantment around this elegant contender. Mums like these are perfect for a cottage garden and a tea setting suited for Alice's Wonderland. Get the scones and jam ready, but be on the lookout for the mantis – it too may be looking to have an afternoon snack.
- Japanese anemones (*Anemone hupehensis*) are winners as the most graceful fall blooms. These loose and free-spirited sprays of cupped, golden-centered flowers resemble wild roses. They are a true fall season treat that I look for every year in the garden. Fall is the queen of mellow yellow, reds and rusty orange, but the anemone didn't get the memo – it is pink! Imagine every park visitor's face of surprise when they lay eyes on these flowers in our Japanese Garden. If you prefer white instead, try *Anemone x hybridus* "Honorine Jobert" – it is ever so elegant with tall stems of pure, white, simple flowers.



It is easy and simple to introduce any of these beautiful plants to your garden. All it takes is a little bit of pre-planning and you too can have your own "Fall Show-off Gala" to smile over. Don't let your garden fade, fall is still a great time to play outside, and enjoy the blooms for months before the winter settles.

The Secret Interactions Of Plants

Jason Goldman, Park Naturalist

The plant kingdom is a wonderful and mysterious collection of photosynthetic organisms. Plants have evolved an array of traits in order to overcome various challenges after existing in terrestrial environments for half a billion years. This article will shed some light on the secret interactions that plants exhibit all around us, often going unnoticed by us.

Plant Responses to Herbivory

With autumn's embrace upon us, deciduous trees have begun dropping their leaves. The only trees to retain their foliage are the evergreens, right? Not exactly. The next time you enjoy a meander through the woods, take a look at the beech trees nearby. You'll notice their branches remain adorned with tan, dried leaves. This trait is called Marcescence. To add further mystery to this phenomenon, beech trees typically retain these low nutrition leaves on just their lower branches...but why?



Beech tree in winter.

Imagine you have a time machine and set it to one hundred thousand years in the past. The ecosystem you'd be standing in would house majestic megafauna such as giant deer, ground sloths, and mastodons. These hungry herbivores would need a constant supply of food and calories, and that extends throughout the winter months.

Tree buds, as it turns out, are a very nutritious source of food during the time of year when there's not much else on the menu. It is currently theorized that marcescence evolved as a means of protection to deter hungry herbivores from eating the nutritious buds, which in turn would ensure the plants can bloom and reproduce next year. Even though North America no longer has those lumbering megafauna, these plants retain marcescence as a living remnant of the past.



Mastodon lived 100,000 years ago.

Anti-herbivory behaviors also happen right in your own garden. Certain vegetables including corn and tomatoes will emit SOS chemicals, called volatile organic compounds (VOC), once a caterpillar chews on their leaves. These VOC attract wasps that in turn parasitize the pesky caterpillars. What is amazing is that the plants utilize the caterpillar's own saliva to create a species-specific VOC, ensuring that the correct species of wasp comes to the plant's aid in time.

The VOCs have a secondary benefit. Once a plant takes insect damage and calls out for help, neighboring plants also detect the VOCs in the air and begin building up their defenses. Deterrents such as tannins build up in the neighboring plants, making their foliage less palatable to the insect herbivores. Given enough time to prepare, the neighboring plants, which are often the eaten plant's kin, may be spared.



Hornworm parasitized by braconid wasp.

Plant Responses to Neighboring Plants

Crown shyness has been on researchers' minds for a century or more. No, it has nothing to do with a self-conscious king's attempt to hide their bald spot. Instead, it is the naturally occurring phenomenon in certain tree species where the canopy growth looks as if the plants are actively avoiding each other. The cause of crown shyness is unclear, with differing theories existing for each tree species.



Crown shyness in Malay camphor trees.

In one instance, the branch tips of black mangroves in Costa Rica showed signs of abrasion caused by wind. As one tree's growth tips rubbed against its neighbor's, the resulting damage prevented both trees from growing into each other. In another study around the world, the growth tips of Malay camphor trees showed little to no abrasion. Scientists discovered that these branch tips can detect different wavelengths of light, with each wavelength signaling something unique. If blue light was detected by the growth, the tree knew that it was growing towards the shade. Conversely, far-right light signaled that a neighbor was just ahead and that the plant shouldn't continue growing in that direction.

One of the most fascinating and fastest growing areas of plant research pertains to the underground system of plant roots and fungi called the mycorrhizal network. Countless interactions take place here every day. The plants hold up their end of the bargain and provide the fungi with sugars formed via photosynthesis. In exchange, the fungi use their smaller filaments to collect nutrients too difficult to reach for the larger plant roots. But the exchange is much more complicated than that!

Suzanne Simard set out to shine some light on this invisible phenomenon. Based out of British Columbia, her research has taken place in the towering forests populated by Douglas fir trees. Initially, Simard set up an experiment where she sealed a branch on one fir tree, and then added carbon isotopes to the sealed area. Once the tree absorbed the traceable carbon, Simard could then track where the tree transported it, now in the form of sugar.

The experiment was a huge success. Not only was Simard able to detect the carbon isotope throughout the original tree, but she was also able to locate where the tree had passed its sugars along to the mycorrhizal network underground. Furthermore, neighboring trees had also received the isotope-enriched sugars. Curiously, the data showed that a certain age group of neighboring trees received most of the transported sugar. Any guesses? It was the young saplings. Simard theorized that this was evidence of parental care in plants. In a healthy forest, low amounts of sunlight reach the forest floor where the seedlings grow, so Mom and Dad send sugar to their offspring until they're tall enough to make their own food. Simard's subsequent experiments utilizing kin and non-kin seedlings heavily reinforce this exciting concept! Simard has coined the term "Mother Tree" to denote the crucial role these large trees have in the forest ecosystem.

Consider this, plants don't have legs to run away from a threat, or mouths to call out for help. They can't cook a meal to feed their family. And yet they have just as many challenges to face as any other organism on our planet. Due to these limitations, they've had to evolve a host of different strategies to prosper. Furthermore, as new technologies develop, we are learning how plants use cooperation a lot more than initially conceived. The next time you go for a stroll in the woods, think about all of these wonderful interactions taking place right in our backyard. The plant world is alive!



Thread-like mycelium on the forest floor.

Photo Sources

- 1 https://commons.wikimedia.org/wiki/File:Fagus_grandifolia_beech_leaves_winter.jpg
- 2 https://commons.wikimedia.org/wiki/File:Mastodon_color.jpg
- 3 https://commons.wikimedia.org/wiki/File:Tobacco_Hornworm_Parasitized_by_Braconid_Wasp.jpg
- 4 https://commons.wikimedia.org/wiki/File:Dryobalanops_Aromaticum_canopy.jpg
- 5 https://commons.wikimedia.org/wiki/File:Mycelium_in_forest_floor.jpg



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