



CNY STORMWATER COALITION

Gardens and Gutters

A Central New Yorker's Guide to Managing Stormwater Runoff

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Essential Nutrients for Healthy Soil

Are the leaves on your vegetable and flower plants wilting or becoming discolored? During the summer growing season, plants may exhibit stress from environmental issues such as high temperatures or drought. Soil health is also a critical part of a successful gardening strategy and is often the key to understanding plant growth and productivity. For that reason, this newsletter begins with information about the essential nutrients that are required for plant efficiency and yield in yards and gardens. Information in the newsletter is also provided on the special value of trees in urban neighborhoods, vegetative buffers, and plant selection, timing and placement. These topics are designed to help the gardening community while improving local water resources.

Plants require water, sunlight, warm temperatures, and nutrients for healthy growth. The quality of the garden soil is important because it influences how well your plants will grow and how susceptible they will be to insects and disease. Most vegetables and flowers will thrive in well-drained, slightly acidic soil that is rich in organic matter. It may take a bit of time to develop deep, rich organic soil in your garden but it will be worth the effort when you see how well your plants will flourish.

Plants absorb most nutrients and water through their roots. At least 16 essential nutrients are required for healthy plant growth and they are often classified as either macronutrients or micronutrients. The macronutrients, required in the largest amount, include nitrogen (N), phosphorus (P),

potassium (K), calcium (Ca), magnesium (Mg), and sulfur (S). These nutrients are available in varying amounts in most Central New York soils. Nitrogen, phosphorus and potassium are the most important because greater amounts of these nutrients are required by plants. Percentages of these nutrients are printed on the front of general use fertilizer bags at the garden store.

Continued on page 2



Essential Nutrients for Healthy Soil *(continued)*

Micronutrients (sometimes referred to as trace elements) include boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), and zinc (Zn). They are required in much smaller amounts. Some micronutrients may be needed by some but not all plants. Cobalt for example helps legumes to efficiently access and utilize nitrogen but isn't essential for most other plants. Plants are able to absorb carbon (C), hydrogen (H) and oxygen (O) from the air and water.

Another important part of soil health is the pH level which affects the plant's ability to absorb nutrients. Most nutrients are available to plants if the soil has a pH of between 6.5 and 6.8. The plants won't be able to efficiently absorb nutrients if your soil is acidic (low pH, at or below 6.0) or alkaline (high pH, above 7.0). Lime, commonly used to raise the pH of acidic soils, is sold at garden stores and will benefit your vegetables, lawn and flowers when applied to the soil.

Soil that contains organic matter such as leaves and grass clippings are able to efficiently absorb and store water and nutrients. Throughout the growing season, gardeners are encouraged to supplement the soil with compost, aged manure, mulch, or other organic matter. This is an effective way to improve soil characteristics and plant health. Plants that grow in well-drained soil with a good supply of nutrients will produce healthy and nutritious vegetables and beautiful flowers that require

fewer pesticides and fertilizer applications. In addition to organic matter, healthy soils also contain a natural balance of fungi, bacteria, earthworms and other organisms that help with the decomposition of organic matter and improve nutrient availability to plants.

Plants often display certain characteristics such as stunted growth or discolored leaves when there is a nutrient deficiency in the soil. For example, the leaves on flower and vegetable plants will turn yellow if there is a nitrogen deficiency. They turn yellow because the leaves aren't able to produce enough chlorophyll. This will stunt the growth and reduce the productivity of the plants.

Be sure to test the soil in your lawn and garden to determine if the nutrient levels and pH are sufficient. The best time of year to do this is in the spring or fall. If fertilizer or lime is needed, they should be added before the cold weather arrives. Your county Cooperative Extension office often provides soil testing services at a reasonable price. You can also purchase soil testing kits at the garden store but these tests may not provide a helpful interpretation of the results. The soil test will generally provide information on pH, magnesium, phosphorus, calcium, potassium, and sometimes nitrogen. The micronutrient content isn't essential if you have added plenty of organic matter to the soil.

Soil Testing

Be sure to test your soil before applying fertilizer. Gardeners can help to improve water quality by reducing or eliminating applications of phosphorus fertilizer on lawns and gardens. In New York State, it is illegal to use phosphorus fertilizer on lawns that don't need it. Refer to page 7 for additional information about fertilizer laws.



Garden Equipment Maintenance

Summer is a good time of year to check gas-powered lawn and garden equipment to ensure that it is well-maintained and in good repair. Without regular upkeep, oil, gasoline, and coolant may drip onto the garden soil, roads, and driveways. These pollutants can then flow into nearby lakes and streams as stormwater runoff, causing harm to humans, fish, plants, and wildlife.

Here are a few recommendations that will protect local water resources:

- During vehicle maintenance, place a drip pan underneath to capture fluids. If spillage does occur, clean the area by using absorbent materials such as cat litter. Spread the material over the spill, sweep it up and then throw it away in the trash. Never use a hose to clean up spills.
- Recycle grease and oil. Don't pour it into sinks, floor drains, or onto a parking lot or street. Always keep grease bins covered and contained.
- Keep your liquid wastes separated. Many automotive fluids can be recycled through hazardous waste disposal companies if they aren't mixed.
- Recycle solvents, oil and used filters, anti-freeze, batteries, lubricants and metal filings. Contact the Onondaga County Resource Recovery Agency or a licensed hazardous waste hauler for additional guidance.



Onondaga County CommuniTree Stewards

The Onondaga County CommuniTree Stewards program is a volunteer, service-based program that is provided through Cornell Cooperative Extension. It offers free training in biology, identification, planting, and maintenance for young trees.

The program was created in 2002 in response to the Labor Day Storm and decades of tree-loss from Dutch elm disease in Syracuse. Since then, 315 tree stewards have been trained, nearly 8,000 trees have been maintained, and more than 4,800 trees have been planted.

Volunteer training is held in the Spring and includes classroom and field work. Steward volunteers then assist with community tree projects and they continue to receive hands-on education and technical experience in urban tree management. CommuniTree Stewards have saved Onondaga County and Syracuse tax payers thousands of dollars in tree service labor and have made our neighborhoods a more beautiful place to live.

For additional information, contact Clare Carney, Natural Resources Program Educator, at cec294@cornell.edu or (315) 424-9485 x 263.

Lawn and Garden Chores

During this time of year, the hot weather threatens to bake Central New York lawns, flowers, and vegetable plants so they may require some special care. The best time to do garden chores is in the early morning or late evening when temperature is more comfortable. Listed below are a few suggestions to guide you and your plants safely through the summer weather.

Take care when you water your plants during periods of drought; early morning is the best time. Avoid getting leaves wet in the hot sun and avoid soaking containers during the hottest part of the day – both of these actions can burn the plants. Give your lawn and garden one inch of water at a time. If conditions are hot and dry, increase the frequency of watering but not the amount. Beware of powdery mildew which is caused by moisture and humidity. You can reduce the potential for mildew by watering in the cool of the morning. The roots can absorb water during this time of day but excess water will evaporate as the day warms.

Add mulch to the base of your plants at any time of year. During the summer it will help to cool the soil and hold moisture. Choose well-composted mulch in hot weather rather than fresh manure or grass clippings.

Deal with late-season pests such as aphids, whiteflies, and spider mites with a spray of water from the hose. Treat diseased plants and remove diseased foliage before the leaves drop. When the temperature is over 85

degrees, avoid chemical applications such as fertilizer, fungicide, or insecticide.

August is a good time of year to propagate plants by collecting seeds and taking cuttings. Label your plants with garden stakes – especially the perennials that die down to the ground in the fall. You'll be glad you did next spring. Spring and summer-flowering perennials can be divided and transplanted after blooming but reduce plant stress by doing this during the coolest part of the day and preferably in the shade.



Continue to remove old flower and leaves from your garden plants and remember to trim and fertilize the flowers, vegetables and herbs in your planters and containers. This is a good time of year to prune back climbing plants such as wisteria. Train them around trellises while the growth is soft.

Make sure newly planted shrubs and trees get plenty of water. Check your fruit trees on a regular basis and pick up and destroy fallen fruit. This will reduce insect infestations and problems with hungry wildlife.

Water the lawn deeply and infrequently. To help your grass deal with hot weather, reduce the mowing frequency and keep your lawn mower blades on the highest setting. Don't worry if parts of your yard turn brown this time of year – most of the time it will recover after the next rainfall. Give the grass a facelift by aerating and dethatching the lawn.

The Special Value of Trees

Stormwater runoff is caused when precipitation from rain and snowmelt flows over land and impervious surfaces without filtering through the ground. As stormwater flows over impervious areas such as streets, sidewalks, and parking lots, it collects chemicals, sediment, and other pollutants that flow into nearby water resources untreated. This pollution impairs water quality, creating health problems for people, animals and aquatic organisms.

Stormwater runoff often contains pollutants such as oil, grease, metals, and coolants from vehicles; fertilizers, pesticides, and other chemicals from farms, gardens, and homes; bacteria from pet wastes and failing septic systems; soil from construction sites and other bare ground; detergents from car and equipment washing; and pollutants from accidental spills and leaky storage containers. The stormwater flows to nearby gutters and storm drains, where it eventually drains into nearby water resources. These are the same bodies of water that are used for recreation, fishing, and drinking water. Stormwater is a major contributor to nonpoint source pollution.

Sometimes a simple, natural solution can provide the best approach when it comes to water quality protection.

Since the most effective way to manage pollution is to control it at its source, many Central New Yorkers are recognizing trees for their significant value in decreasing

the amount of stormwater runoff and pollutants that reach local waters. Trees serve a valuable function in pollution control by soaking up rainwater, absorbing nutrients, and reducing the amount and velocity of stormwater runoff. Trees absorb water primarily through the root system but some tree species are also able to absorb water through their leaves and transpire it directly back into the atmosphere. The roots and vegetation help to slow the rate of stormwater runoff during strong storm events. The leaves and branches also intercept rain by retaining the water in the tree canopy. In this way, trees are able to disperse precipitation over

a longer time period and reduce the velocity of the water when it eventually falls to the ground. According to the USDA Forest Service, a typical medium-sized tree can intercept as much as 2,380 gallons of rainfall per year. Tree roots also stabilize the soil which reduces the potential for erosion. The water absorbed by roots and vegeta-

tion reduces the threat

from flooding and increases groundwater recharge.

Property owners, businesses, and community groups in Central New York often plant trees throughout their neighborhoods because of the environmental and social benefits they provide. In addition to helping with stormwater management, trees provide clean air, improve wildlife habitat, and provide shade during hot summer months. As an additional benefit, research has also shown that trees boost property values and promote tourism.



Trees provide cooling and shade on the Syracuse University campus (photo source)

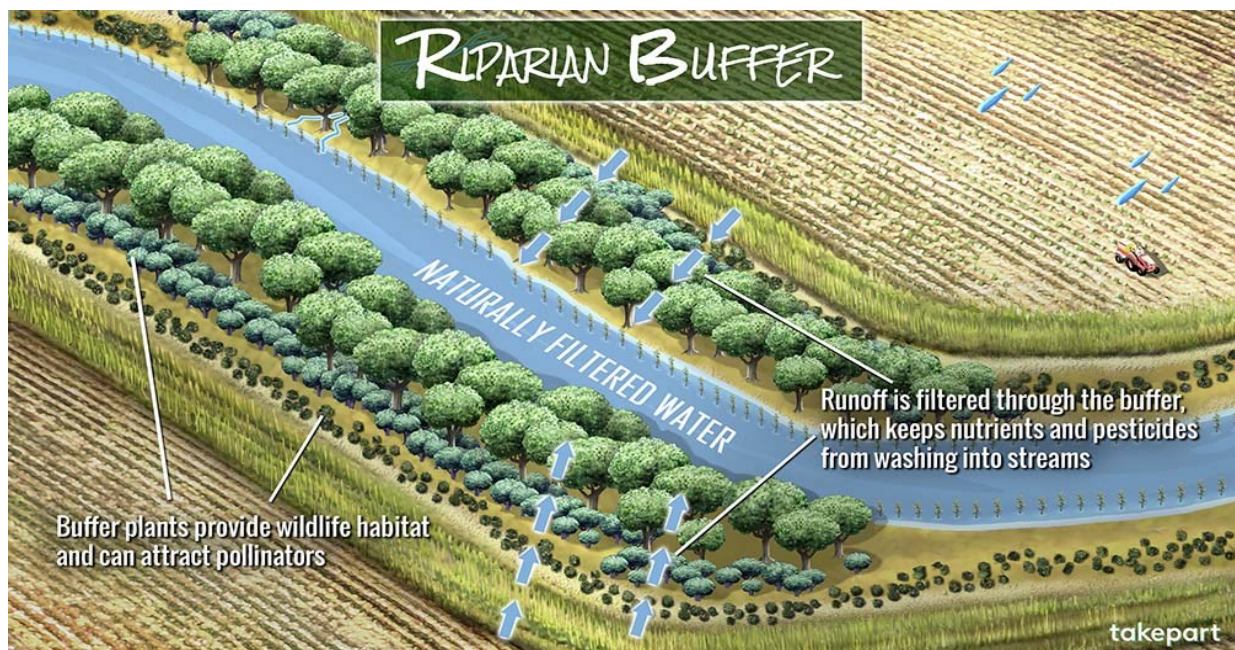
Vegetative Buffers: A Worthwhile Tool for Water Protection

Riparian (stream) buffers are areas along the shoreline of rivers, stream and lakes that are planted with trees, bushes or grass. They serve an essential role in protecting water quality by filtering nutrients and other pollutants and reducing the flow rate of stormwater runoff. The vegetation and roots stabilize the shoreline, reduce the potential for soil erosion, and replenish groundwater supplies.

Vegetative buffers are also valuable at controlling stormwater runoff from yards and gardens, even if they aren't located near water resources. Buffers should be planted using native vegetation which is adapted to local climate conditions and the plants can range from a thick undergrowth of shrubs to a canopy of large mature trees. They provide a vegetative area between waterbodies and pollution sources in upland areas such as agricultural fields or urban neighborhoods. As with rain gardens, vegetative buffers work to filter sediment and reduce the rate of stormwater runoff. A diverse selection

with many different types of trees, shrubs and grasses in the buffer will provide greater protection and resilience to drought and extreme storms, disturbance by deer or rodents, and invasive species or pests.

Under ideal conditions, the portion of the riparian buffer that's located closest to the waterbody should be planted with native species of water-tolerant trees and large shrubs. These plants stabilize the streambank soil and provide shade which creates better conditions for brook trout or other cold water-dependent fish species. The adjacent area should be planted with smaller, shade-tolerant trees or shrubs. This area absorbs runoff which is important for flood control. Nutrients and other pollutants are also filtered by the roots and soil. The area farthest from the stream should be planted with native grasses, wildflowers, or other herbaceous plants to reduce the rate of stormwater runoff.



Riparian buffers protect water quality by filtering nutrients and other pollutants and reducing the flow rate of stormwater runoff.

Plant Selection, Timing, and Placement



Native plants attract birds and other wildlife. Photo source: Audubon

Plant issues relating to insect damage, disease, soil nutrition, and unpredictable weather often cause headaches for Central New York gardeners. A few things can be done, however, to minimize these problems. Proper plant selection is a good place to start.

Perennials can be planted in the spring or fall. As you head to the garden store, be sure to select native plants because they are generally well-adapted to the local conditions. The term 'native plant' refers to trees, bushes, flowers or grasses that are adapted to the local environment.

Gardeners can save time and money if native plants are selected because they are adapted to dry conditions and require less watering during periods of drought. They tend to grow well in local soils and require less fuss when it comes to fertilization. Many native plants are also better able to resist insect pests and disease and therefore require few applications to pesticides.

Cornell Cooperative Extension advises gardeners to place new plants in areas with similar water requirements. When selecting grass seed for the lawn, use a drought-tolerant variety such as fescues. When mowing the lawn, leave a height at least three inches to encourage larger root systems and leave the grass clippings on the lawn. Aerate the lawn in the late August or early September so that air and moisture can move through your soil.

NYS Law Restricts the Use of Lawn Fertilizers Containing Phosphorus

In NYS, it is illegal to use phosphorus fertilizer on lawns that don't need it. The fertilizer provisions of the NYS Dishwasher Detergent and Nutrient Runoff Law are designed to reduce the amount of phosphorus entering the state's waters and improve water quality in ponds, rivers, lakes and streams. The law sets restrictions on the use of phosphorus fertilizer on lawns or non-agricultural turf. Only lawn fertilizer with less than 0.67 percent by weight phosphate content is permitted. Be sure to follow these guidelines:

Application of any fertilizer containing nitrogen, phosphorus or potassium on lawns or non-agricultural turf is prohibited between December 1 and April 1.

Application of any fertilizer on lawns or non-agricultural turf within 20 feet of a water body or on paved surfaces is restricted.

Retailers must display phosphorus fertilizer separately from phosphorus-free fertilizer and must post signs notifying customers of the terms of the law.

Check this website for additional information—<https://www.dec.ny.gov/press/81508.html>

CNY STORMWATER COALITION

The CNY Stormwater Coalition was formalized in 2011 in order to establish a regional approach for stormwater management and water resource protection. The Coalition is made up of 29 local governments and the NYS Fairgrounds. Each member operates a Municipal Separate Storm Sewer System (MS4). Through the Coalition, members are working together to meet regulatory requirements while improving water quality.



CNY STORMWATER COALITION MEMBERS

Baldwinsville Village	Manlius Village
Camillus Town	Marcellus Town
Camillus Village	Marcellus Village
Central Square Village	Minoa Village
Cicero Town	North Syracuse Village
Clay Town	Onondaga County
DeWitt Town	Onondaga Town
East Syracuse Village	Phoenix Village
Fayetteville Village	Pompey Town
Geddes Town	Salina Town
Hastings Town	Solvay Village
LaFayette Town	Sullivan Town
Liverpool Village	Syracuse City
Lysander Town	Van Buren Town
Manlius Town	NYS Fairgrounds

The CNY Stormwater Coalition meets quarterly throughout the year and all meetings are open to the public. Check the Coalition's website for the times, dates, and additional meeting details. The CNY Stormwater Coalition is staffed and coordinated by the Central New York Regional Planning and Development Board. For additional information, visit the CNY Stormwater website www.cnyrpd.org/stormwater

Responsible Pet Care

Don't forget to pick up after your dog and never place the dog waste (bagged or un-bagged) in storm drains. The untreated stormwater in the drains lead directly to local streams, rivers, lakes and wetlands.

When dog waste is left on the ground, rain water transports it to local lakes and streams where it decreases water quality. The waste contains fecal coliform bacteria and parasites that can cause human diseases and health problems. Dog waste also contains nitrogen and phosphorus that promote the growth of unwanted algae and rooted aquatic plants in lakes and streams. Scooping your dog's waste isn't just a courtesy for those walking behind you; it also keeps our water resources safe.



you're invited

Save the Rain
CLEAN WATER FAIR

9.8.18
9am-2pm
☾☾☾

**Onondaga County Department of Water
Environment Protection, 650 Hiawatha Blvd West**

FEATURED ATTRACTIONS

- 🔍 Tours of the state-of-the-art Metro treatment plant
- 👶 Kids' activities
- 🌧 Rain barrel classes
- 📺 Update on Save the Rain/Connect the Drops programs
- 🦋 Viewing lake wildlife

Free event

no registration

Joanne M. Mahoney
County Executive

For more information, visit savetherain.us/2018-fair



Central New York Regional Planning & Development Board



CNY Stormwater Coalition



@CNYStormwater