Earth-Friendly Gardening

One yard at a time

Protect Our Pollinators

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Protect Our Pollinators

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Graphic design by Marcia Chaloux ©2021

Chairman's Notes

It was five years ago this summer that members of **Protect Our Pollinators**[1] first gathered and began their journey learning about and promoting ways to protect pollinators and their associated habitats. This guide is being written to mark that occasion and is an attempt to put together some of the things we have learned along the way. It is oriented to the reduction or elimination of pesticides because we believe that the use of toxic chemicals is counter-productive and detrimental to the very habitat and species we aim to protect.

The original concept for this publication came from talking to the public about the possibility of joining the **Pollinator Pathway Northeast**[2]. Many folks said they practice pesticide-free gardening and lawn care, except for that "one apple tree" or that "one specimen tree", etc. Thus, we realized that, although there may be support for a pesticide-free lifestyle, in the real world there are situations which make it difficult to use only non-chemical solutions.

This brought us to the gray area of alternative or "organic" pesticides, things like Bt, cedar oil, limonene, etc. Are these products really safe for pollinators and can they be used if you are on the Pollinator Pathway? With the help of a Xerces Society publication[3], we evaluated a number of these in terms of their effect on pollinators and their overall toxicity. Finally, a statement was adopted by the Pollinator Pathway as published on their web site, "A number of less toxic substances such as neem oil, cedar oil, insecticidal soap, etc. can be used, assuming proper usage and timing."

Thus these substances are allowed IF all other safer methods have been ruled out AND if consideration is given to usage (lowest effective dosing and only spot treatment where possible) and timing (no spraying if blooms are present or if blooms are present spraying only during early evening when pollinators would have left the site for the day).

Given that these exceptions can be made, the bulk of this guide provides many suggestions for strategies using non-chemical methods. As we researched we found that many gardeners have developed safe and effective ways to cope with a variety of lawn and garden pests. Also, scientists are discovering new biological solutions all the time.

So as I think back over the last five years, I think of many happy events, accomplishments, and friends made. Pollinator advocates in general are special people because they understand the interrelationship among the plants, birds, insects, the soil, the water resources, the wildlife and human life. Everything is connected. Which is why we feel so strongly against toxic chemicals. If a pesticide affects one element of a habitat, it will, by definition, affect other elements.

It has been a privilege to be associated with my fellow POPPERs, a very dedicated and informed group. We developed a Web site (***www.Propollinator.org***), wrote many informative hand-outs, sponsored meetings, attended meetings and spoke at meetings, became associated with the Pollinator Pathway coalition, sponsored and participated in a pollinator-themed concert, sponsored an art event for school children, developed and continue to maintain a number of pollinator gardens around town, and marched in the Labor Day parade dressed as bees and butterflies! It all has been an adventure!

Mary Wilson

1. *Protect Our Pollinators is a Newtown-based advocacy group whose interests include all pollinators and their habitats. www.propollinators.org.*
2. *The Pollinator Pathway is a coalition of towns in Connecticut and eastern New York State whose members agree to plant native plants and refrain from using harmful pesticides. www.pollinator-pathway.org.*
3. *Organic Pesticides: Minimizing Risks to Pollinators & Beneficial Insects at https://xerces.org/guidelines-organic-pesticides.*

Soil Health

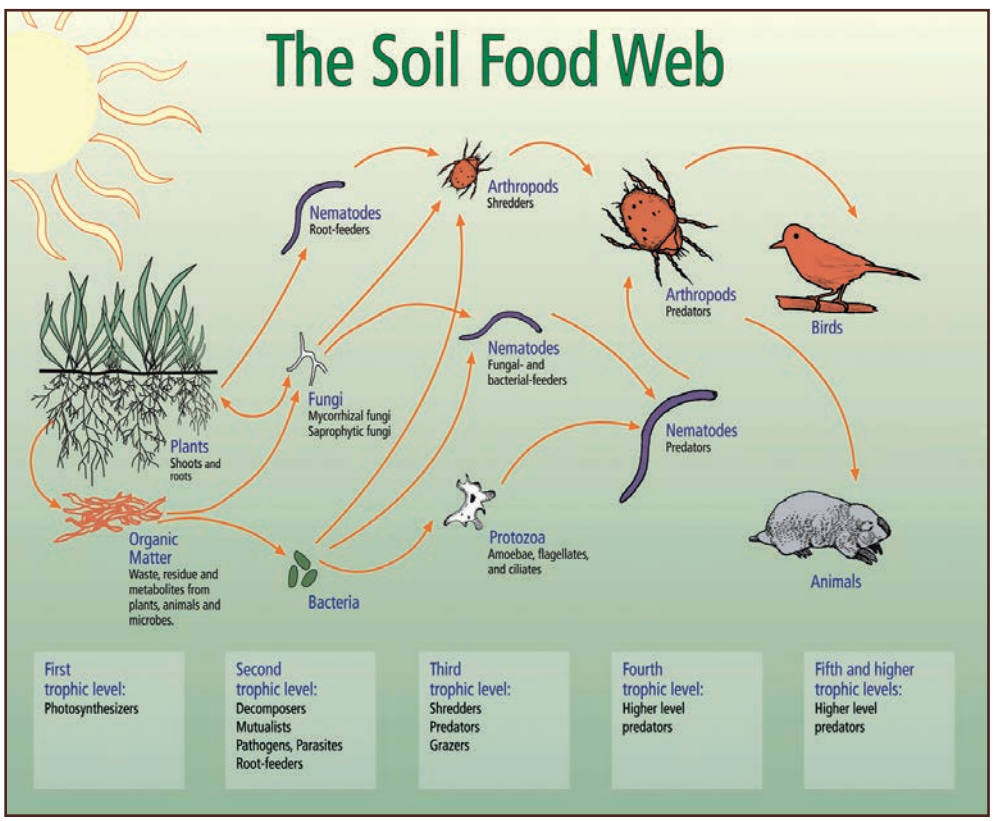
Sarah W. Middeleer, ASLA

It's not just dirt. According to the USDA, one teaspoon of productive soil generally contains between 100 million and 1 billion bacteria. These microbes are essential to the well-being of plants and other organisms in the soil food web.

photo by Mary Wilson

Healthy soil is literally the foundation of a successful organic garden. Above ground, you'll see lots of color and activity due to thriving ornamental and food plants, as well as happy pollinators and songbirds. But under the surface there is a fascinating world (called *the soil food web*—see below), containing billions of organisms—from one-celled bacteria, algae, fungi, and protozoa to more complex nematodes and micro-arthropods, and larger creatures such as earthworms, insects, and small vertebrates. They all function together to fertilize and protect plant roots, drive away pests, reduce erosion, retain moisture, filter pollutants, and sequester carbon. When we alter this humming metropolis, either by excessive tilling or by introducing synthetic fertilizers and pesticides, we end up sacrificing parts of this balanced system, which can result in poor plant health, overabundance of some organisms, reduced nutrients and increased toxins in food plants, or a soil's reliance on chemicals to keep producing.

If you are an experienced gardener you probably have a pretty good idea about the health of your soil, but perhaps there are problem areas you're not sure what to do about, or garden pests that threaten some of your plants. If you are newer to gardening or are having trouble growing certain plants in certain places, you may want to get your soil assessed. Regardless, there is a lifetime of learning to be had within the subject of soil health. But for these purposes we will stick to a few basics, with an emphasis on how pesticides affect soil health. Additional resources are listed at the end of this article, should you wish to "dig deeper."



Soil comes in three basic structural types: sand, loam, and clay. Most soils lie somewhere on a spectrum between these types, e.g., sandy loam. The more sandy a soil is, the faster water will drain from it and the less it can retain nutrients. Clay soil doesn't drain fast enough but retains nutrients well. And loam is the Goldilocks' choice of soil types: just right (for growing most garden plants).

Soils also have different chemical characteristics, one of which is noted by pH, or acidity. A soil pH less than 7 is

acidic, which describes most Connecticut soils. Seven is neutral, and above 7 is basic (or alkaline). Different plants prefer different levels of acidity, but most prefer a pH between 5.5 and 7.5. For instance, blueberries, mountain laurel, and rhododendrons all prefer acidic soil. Typically our garden vegetables, culinary herbs and turf grass prefer a "sweeter," i.e., more basic soil.

Other soil elements include nitrogen, phosphorus, calcium, iron, magnesium, etc., and depletion of any of these elements can result in unhealthy plants (the signs of which may be mistaken for disease or infestation). Soil can be tested by your local extension service for a modest fee. They will typically ask what you wish to grow (e.g., perennials, shrubs and trees, vegetables, fruit trees, etc.), which will affect their advice on which soil amendments to apply. You can request organic recommendations.

If you notice what is growing naturally in your area you will have a good clue as to what kinds of plants will thrive in your soil. Native plants have adapted to the conditions in which they are found, and the relationship between the plants and soil is reciprocal to ensure the health of both. But new house construction often wipes out the native topsoil (builders often strip the topsoil on a site and sell it), so if you've moved into a brand-new house, you may have more work to rebuild a healthy soil on your property.

Managing soil health means maintaining suitable habitat for the creatures that make up the soil food web. Organic matter fuels the soil food web. As organic matter levels rise in the soil, the organisms break it down and convert it to humus, an accumulation of organic carbon that binds tiny soil aggregates and improves the soil's ability to hold water and nutrients. By regularly applying organic matter such as aged compost, biochar*, green manure** or aged manure, you will build up the organic matter in the soil and improve its ability to support plant growth.

However, some native plants actually prefer nutrient-poor soil. So if you know that your soil is quite sandy and/or rocky, before you go to great effort to enrich it, you may wish to simply use plants such as little bluestem, bearberry (kinnikinick), columbine, butterfly milkweed, black-eyed susan, yarrow, etc. Know your soil and what is best suited to plant in it.

Soil disturbance reduces soil health. Disturbance includes excessive tilling, which results in bare and/or compacted soil that threatens soil microbes, and the use of pesticides and synthetic fertilizers, which upset the symbiotic relationships between microorganisms and plant roots.

Pesticides—including herbicides, insecticides and fungicides—are chemical compounds designed to kill, each with their own targets and mechanisms of action. According to Friends of the Earth, as little as 0.1 percent of an applied pesticide interacts with its targeted weed or pest. The remainder contaminates the soil, air and water and can have significant non-target effects throughout the ecosystem.

A common weed killer, glyphosate (Roundup), damages the ecology of mycorrhizal fungi that enable the flow of carbon to the soil. It also threatens earthworms' casting activity and reproduction—and has been shown to cause an increase in pathogenic microorganisms in the soil, impairment of respiration of soil dwelling organisms, and nutrient immobilization for plants and microorganisms. Not to mention that glyphosate has been identified as a possible carcinogen for humans and pets.

So learn what your soil type is, plant appropriately for its type, start a compost pile or join your municipal composting program, and enjoy all the benefits of healthy soil and a healthier you!

Vaccinium corymbosum-Blueberry
Needs acidic, moist soil

Aquilegia canadensis-Wild Columbine
Tolerates dry, rocky soil

Asclepias tuberosa-Butterfly Weed
Needs well-drained soil

Schizachrium scoparium-Little Bluestem
Infertile dry soil, acidic or alkaline

* *A type of charcoal used for amending soil, made from agricultural waste burned without oxygen.*

** *Uprooted plant parts left on the soil to serve as mulch and soil amendment. Cover crops used in organic agriculture are often used this way.*

Resources:
Beyond Pesticides; Connecticut Botanical Society; Cornell Soil Health Testing Laboratory; Friends of the Earth; Natural Resources Conservation Service; Permaculture Research Institute; Rodale Institute; UConn Extension Service; Wikihow.com–how to compost

Reasons to Go Pesticide Free

Mary Wilson

If you have started reading this guide, you probably already think that using chemical pesticides (insecticides, herbicides, rodenticides, etc.) is inconsistent with the way you want to manage your yard and garden. Maryann Henein, investigative journalist and professional researcher, lists the following top reasons for going pesticide-free. Some of these you may not have thought of previously.

Pesticides don't solve pest problems.
If they did, we wouldn't need to use them repeatedly. It would be wiser to change the conditions that make pests thrive.

Pesticides are hazardous to our health.
According to the Environmental Protection Agency (EPA) symptoms from pesticide exposures can range from mild symptoms of dizziness and nausea to serious, long-term neurological developments, and reproductive disorders. A very commonly used product, Roundup (glyphosate), has been linked to human cancers and birth defects.

Pesticides cause special problems for children.
Because of their small size, children drink proportionally more water and eat more food than adults, both of which can be contaminated. Also, children's protective organs may not be developed fully yet, making them even more vulnerable to stressors.

Pesticides contaminate our food.
Even after peeling and washing fruits and vegetables, about 60 percent of our produce still contains more than one pesticide, according to the USDA.

Pesticides are particularly hazardous for farmers, farm workers, and people who live near them.
The EPA has estimated that at least 10 and 20 thousand pesticide-related illnesses occur among farmers and farm workers every year. Also, mothers who live near farms and are exposed to insecticides are more likely to have children with ADHD and other neurological conditions.

Pesticides are dangerous to pets.
The American Association of Poison Control reports that only anti-freeze (a chemical but not a pesticide) causes more pet poisoning deaths than rodent control pesticides and organophosphate insecticides. Also, lawn chemicals which contain 2,4-D have been linked to canine cancers including lymphoma and bladder cancer.

Pesticides contaminate our water.
According to a national study, 90% of our nation's urban streams are contaminated with pesticides.

Pesticides are not good for fish and birds.
Pesticide contamination of our waterways can be particularly harmful to fish and other marine or freshwater species. Some chemicals like neonicotinoids are systemic (affecting the whole plant) and most are very soluble, which allows them to run-off and accumulate in water courses and groundwater. Also, neonicotinoids used as herbicides are particularly harmful to birds that may ingest them.

Pesticide "Health & Safety Testing" is conducted by chemical companies.
The EPA does not conduct independent studies. They rely on the chemical companies to do the testing from which label warnings are generated. One might think that the chemical companies have a vested interest in these results.

Over one BILLION pounds of pesticides are used in the U.S. annually. There are many good reasons to reduce this chemical dependency.

There are too many things about pesticides that are not known.
Government agencies do not track things like quantities sold, who purchased them and when, and what were they to be used for. But we do know that many persist in the environment and they often synergize when combined. Also, inactive ingredients may not be really inactive at all.

What Can We Do?
With little control from government agencies, the individual is left with few good choices and little control. What we can do is to make responsible choices for our own property, shop at nurseries selling plants that have not been pre-treated with pesticides, encourage neighbors and friends to be aware, support groups who have similar goals, and let your town officials and legislators know of any concerns. And don't forget children. They usually understand the message and who can resist an appeal from an earnest 10-year-old?

For a list of lawn pesticides to be avoided see spreadsheet on the next page.

Reference:
Henein, Maryann, "Top 10 Reasons to Stop Using Pesticides Now," HoneyColony, December 28, 2014

Pesticides Harmful to Pollinators

Do not buy or let your lawn care professional use these products

CHEMICAL NAME	USES	TRADE NAME
Neonicotinoids		
Imidacloprid	Agriculture, lawns and lawnscapes, pet pests, gardening	Marathon, Admire, Merit, Premise, Gaucho
Clothianidin	Agriculture, chinch bugs, cockroaches, grubs, clover, fire ants	Arena, Belay, Poncho
Acetamiprid	Agriculture, lawns, broadleaf plants, ants, cockroaches, bed bugs, termites	Tristar, Intruder
Thiamethoxam	Agriculture, corn, beans, coffee, stone fruit, cucurbits, cotton and turf	Centric, Meridian
Dinotefuran	Agriculture, lawns, golf courses & turf, fleas, bed bugs, cockroaches	Sold under Safari, Alpine and Venom
Thiacloprid	Agriculture, cotton, pome fruits	Calypso, Pestanal, TraceCERT
Organophosphates		
Chlorpyrifos	Food & feed crops, golf courses, lawn & garden, adult mosquitocide, wasps, bed bugs, ticks, carpenter bees, aphids, spiders	Lorsban, Dursban, Nufos
Malathion	Many fruit & vegetables, lawns, turf, gardens, evergreen plants, outdoor garbage areas	Fyfanon, Malathion
Diazanon	Many fruits, vegetables, nuts, berries, etc.	Patriot, Diazanon
Parathion	Agriculture, canola, corn, cotton, sunflowers, mosquitoes	Talstar, Mosquito control kits
Acephate	Fruits,vegetables, ornamental plants, fleas and cockroaches	Surrender, Fate, OTTO, Address
Other Common Herbicides/Insecticides		
Glyphosate	Non-selective herbicide used for weed control & many agricultural purposes	Roundup, RangerPro, Monterey Remuda, Weed Impede 2 in 1, Erase Max, Hi Yield Killzall, Aqua Star Aquatic Herbicide, Pronto Vegetation Killer, Bonide Ground Force Vegetation Killer
2,4-D	Non-selective herbicide used for weed control and often a component in lawn care products.	Many “Weed and Feed” products
MCPP (Mecocrop)	Broadleaf weed control in lawns, sports fields, recreational turf, roadsides, sod farms, industrial sites, rights-of-ways.	Bonide Weed Beater and many combination products for lawn care and weed control
Dicamba	Agriculture, golf course, rights of way, etc.	May be sold separately but usually sold as combo product with 2,4-D or other herbicide. Read labels.
Carbaryl	Agriculture fruit and nut trees, many fruits and vegetables, and grain crops; ornamental, turf and golf courses, residential lawns	Sevin

What are Invasive Plants?

Holly Kocet and Mary Wilson

One should learn to identify common invasive plants in Connecticut and removal techniques that do not include the use of chemical pesticides.

Invasive plants are non-native plants that are disruptive in a way that causes environmental or economic harm, or harm to human health. In Connecticut, the Connecticut Invasive Plants Council has developed a list of non-native (introduced) plants that cause (or have the potential to cause) environmental harm in minimally-managed areas.

Invasive plants are defined as having:

- *a high reproductive rate,*
- *the ability to establish new plants and grow rapidly under a wide variety of site conditions,*
- *the ability to disperse over wide distances, often by the spreading of vegetative fragments as well as seeds,*
- *the lack of the natural controls on growth and reproduction that would be found where the invader is native.*

What is the impact of invasive plants on the environment?

In minimally managed areas, invasive plants crowd out our indigenous "native" plants. The presence of invasive plants alters the way plants, animals, soil, and water interact within native ecosystems, often causing harm to other species in addition to the plants that have been crowded out.

Invasive plants deny food and shelter to native insects, pollinators, birds and wildlife that have a symbiotic relationship with native plants developed over centuries. Invasive plants are considered second only to habitat loss as a major factor in the decline of native species. Consider the trees along roadways that have been girdled with invasive oriental bittersweet vines and will eventually die, or the mile-a-minute vine and invasive mugwort that quickly cover acres of land, choking out existing plants.

Invasive, non-native species are considered one of the greatest threats to our environment. The damage they have already caused to natural ecosystems and the economy has cost governments, private land trusts, and landowners billions of dollars each year.

What Can the Homeowner Do?

It may be overwhelming for a property owner to consider the big picture, but a good first step would be to identify any invasive species and learn about organically safe methods of controlling them. Most invasives can be pulled up manually when they are young, so checking your property frequently will help to keep them under control. Please do not use harmful pesticides on invasives because you may be harming things you did not intend to harm such as, beneficial insects, soil bacteria, other plants, your pets and even yourself.

Pesticides should not be necessary for the homeowner. Large tracts of land should be left to the professionals who are licensed and have been adequately trained in the use of toxic chemicals.

More information on invasive plants can be obtained from the *Connecticut Invasive Plant Working Group (www.cipwg.uconn.edu).*

12 Invasive Plants that Threaten our Environment, Economy, and Human Health

Holly Kocet


Japanese Knotweed

Japanese Knotweed (*Polygonum cuspidatum*) is a shrub-like, upright herbaceous perennial that grows to 10 feet. It spreads vigorously from long, stout rhizomes and forms dense stands. It also produces winged seeds that are carried to new areas. A significant threat to riparian areas.

Control: Cut plants three times per year at ground level during growing season to starve roots and rhizomes.


Mile-a-Minute

Mile-a-Minute (*Persicaria perfoliata*) is an annual vine that can grow six inches per day, smothering other vegetation. Seed persists in soil for six years. Seeds are dispersed by birds, mammals and water.

Control: Hand pull plants and roots before fruiting in August. Repeated mowing or weed-whacking will reduce the plants reserves and prevent or decrease flowering. Weevils are effective for bio-control.


Japanese Barberry

Japanese Barberry (*Berberis thunbergii*) is a thorny shrub with a dense twiggy form, growing to five feet. Tolerant of a broad range of soil, moisture and light conditions. Seeds dispersed by birds. Barberry leaf litter changes the chemistry of the soil, displacing many native herbaceous and woody plants. Provides optimum tick habitat. **DO NOT BUY OR PLANT**.

Control: Pull or dig young plants including all roots. Repeated cutting of large plants. Weed wrench® is effective for uprooting.


Oriental Bittersweet

Oriental Bittersweet (*Celastrus orbiculatus*) is a very aggressive vine that smothers other vegetation. It has twining stems that strangle shrub and tree limbs and the weight of the vine can uproot and topple trees. Birds are attracted to the berries and spread seed. The vine also spreads by root suckering. **DO NOT BUY OR PLANT**.

Control: Pull small plants including roots. Cut larger vines close to the ground every two weeks to prevent resprouting and to deplete the root system. Properly dispose of seeds.


Winged Burning Bush

Winged Burning Bush (*Euonymus alatus*) is a deciduous shrub that tolerates a wide variety of soil, moisture and light conditions. The plant produces hundreds of seedlings that are spread by wildlife. This shrub forms dense thickets, displacing native wood and herbaceous species in many habitats including forests and coastal shrublands. **DO NOT PLANT**.

Control: Pull or dig small plants including the entire root. Large plants can be cut at ground level but repeated cutting will be necessary.


Japanese Stiltgrass

Japanese Stiltgrass (*Microstegium vimineum*) is an annual grass that forms dense stands and is very shade tolerant. Spread by seed and by rooting at joints along the stem. A single plant can produce as many as 1,000 seeds and are viable in the soil for three years.

Control: Cut, pull, or mow at the end of July. Dispose of roots and shoots.


Norway Maple

Norway Maple (*Acer platanoides*) is a large tree that spreads by numerous, germinating seeds. Tree can dominate a forest by creating canopy of dense shade that prevents regeneration of native seedlings. Tolerates hot dry conditions and poor soils. **DO NOT BUY OR PLANT**.

Control: Pull seedlings when soil is moist. Dig out larger plants with roots. Cut down large trees and grind stumps or girdle tree in spring.


Mugwort

Mugwort (*Artemisia vulgaris*) is a perennial weed that spreads aggressively through extensive rhizomes and by seed. It forms mono-specific stands anywhere soil is disturbed. Thrives in sun but tolerates shade.

Control: Mow or cut to ground every 2-3 weeks for 2 years. Pulling may result in more plants since it regenerates from its extensive rhizomes. Cut to prevent seedheads from forming.


Autumn Olive

Autumn Olive (*Elaeagnus umbellata*) is a fast-growing woody shrub or tree that produces abundant fruits. Wildlife spread the seed after eating the fruits. This plant grows in disturbed areas such as clearings, open fields and forest borders.

Control: Pull or dig young plants, making sure to get roots. Cut large plants at ground level when in flower to prevent seed production. Repeated cutting will be required.


Multiflora Rose

Multiflora Rose (*Rosa multiflora*) is a thorny shrub that can form dense thickets and can also climb like a vine. It spreads by root suckering, tip layering, and by seed dispersal when wildlife consume it fruits. Often found along roadsides and fields. **DO NOT PLANT**.

Control: Hand pull or dig, removing entire root to prevent resprout. Repeated mowings during growing season for 2-4 years can be effective.


Porcelainberry

Porcelainberry (*Ampelopsis brevipedunculata*) is a vigorous climbing vine that blankets shrubs and small trees, weakening and killing them by blocking sunlight. Fast growing with prolific seeds, it prefers moist habitats and disturbed areas, thriving in a variety of light conditions. Seeds are spread by birds and mammals. **DO NOT PLANT**.

Control: Hand pull vines in the fall or spring. Cut large vines at ground level and cut regrowth as needed.


Black Swallow-wort

Black Swallow-wort (*Cynanchum louiseae*) is a perennial trailing vine. It spreads through rhizomes and wind dispersal of seeds. It is tolerant of a wide range of moisture and light conditions. A threat to Monarch butterflies when eggs are deposited on it's leaves since caterpillars cannot eat this plant and perish. **DO NOT PLANT**.

Control: Pull or dig up large root masses, April to July. Bag and dispose of roots and seed pods.

photos for this article credited to bugwood.com

What are Native Plants and Why Should We Plant Them?

Holly Kocet & Mary Wilson

"We are replacing native plants with alien species at an alarming rate, especially in the suburban garden on which our wildlife increasingly depends.

A plant that has fed nothing has not done its job."

~ Douglas J. Tallamy, Bringing Nature Home

photo by Mary Wilson

When considering what to plant next in your garden, or in that space freed up by the removal of invasive plants, please consider the use of native plants. These plants support native insects, birds and wildlife that we may want to attract to our yards. Natives also are easy to grow, require less maintenance, and very importantly almost never need the use of pesticides! What could be better?

Native plants include perennial herbaceous plants, grasses, shrubs, and trees. Natives have a symbiotic relationship with pollinators and other wildlife. These plants have evolved over a period of time, developing complex and essential relationships with pollinators, birds, and other wildlife species in a given ecological community. Native plants were established here long before the arrival of European colonists.

In the Northeast, we have many wonderful native perennials (also called wildflowers), shrubs, trees, and grasses that thrive in a variety of conditions. Garden perennials such as rudbeckia, lobelia, and monarda attract many species of bees, butterflies and hummingbirds. Native shrubs and trees are attractive and provide many benefits in our landscapes. Spicebush, willow, blueberry and cherry provide early-season blooms and many produce nutritious fruits. Trees such as oak, maple and birch, cool our homes in summer and delight us in fall with gorgeous color.

Native plants are important for their ability to support our native wildlife, especially our plant-eating insects (herbivores) that in turn provide protein-rich food for large numbers of wildlife species. For example, most baby birds are fed with insects exclusively. Also, native plants provide the most nutritious sources of pollen and nectar for pollinators.

Native plants support other native species including pollinators, insects, birds, etc.

All species of butterfly caterpillars require a specific host (food) plant. You may want to be aware of this as you chose plants which will attract certain caterpillars and their adult butterflies. For example, the Monarch butterfly caterpillar requires plants in the milkweed family (Asclepias). Native milkweeds being the only food the Monarch caterpillar can eat.

So, to sum it up, the best things about native plants are:

1. They flourish without synthetic pesticides.
2. Once established they rarely need watering.
3. They require less care since they are adapted to our local climate and soils.
4. They provide food and cover for wildlife.
5. They contribute to biodiversity.
6. They support beneficial insects like lady beetles that help control garden pests.
7. Native trees keep our air and waterways clean and prevent soil erosion.
8. Native plant species connect us to our unique natural surroundings.
9. They teach us about our natural world.
10. Native plants are beautiful!

You Can't Fool Mother Nature

Many introduced (imported) plants are ignored by our pollinators. These specialized cultivars and exotic imports offer little or no benefit to bees and other pollinators.

- Non-native plant species may not provide cues to attract pollinators.
- Specialized colors are not attractive to pollinators.
- Pollinators cannot access double flowers for pollen or nectar.
- Cultivars (nativars) that are too changed from the original plant contain less pollen and nectar.
- Some cultivars no longer produce pollen or nectar at all.

Where Can I Buy Native Plants?

Unfortunately many nurseries do not carry and/or label native plants. You have to ask trusted personnel for that information. However, there are some area nurseries which specialize in natives only. See the next two pages for a list of native plant nurseries and a list of native plants suitable for Connecticut.

Resources for Native Plants

www.propollinators.org • www.pollinator-pathway.org • www.rosedalenurseries.com
www.earthtonesnatives.com • www.northeastpollinator.com
xerces.org/pollinator-conservation/plant-lists/pollinator-plants-northeast-region/
xerces.org/Monarch-conservation/plant

Where to Buy Native Plants

It may not be easy to find native plants for sale but as consumers we have some influence. "The public drives what's in and out of fashion in our gardens," Roaring Brook Nature Center's Margery Winters says, "and it's up to the public to start demanding more native plants for sale."

Earth Tones Native Plants *in Woodbury, CT (earthtonesnatives.com)* is a native plant nursery, opened in 2004, which offers grasses, ferns, perennials, shrubs and trees native to our region. Owners Kyle and Lisa Turoczi grow plants from local seed sources, many of which they collect themselves (with permission, of course), and also provide landscape design, consulting, installation and maintenance services. Check out the site's ***Native Plant Search Wizard***, which helps you find plants with characteristics you desire by allowing you to choose by plant type, flower or berry color, exposure/light requirements, soil conditions, wildlife it attracts and more. The nursery opens for the season mid-April.

Native *in Fairfield, CT (anativeplantnursery.com)* opened in May 2018. Owner William Kenny has operated his landscape architecture firm which focuses on ecologically sound landscape design, for more than 15 years. Native stocks a diverse selection of the region's native plant species, from trees and shrubs to ferns, wildflowers and grasses.

Nasami Farm *in Whately, MA (newenglandwild.org/visit/nasami-farm)* is the New England Wild Flower Society's native plant nursery. Its primary focus is growing plants from seeds that have been collected in the wild by a team of trained staff and volunteers who research and document local sources of healthy, wild populations of native plants. It also partners with local nurseries to grow propagated plants to retail size, which will be available for sale to the public in its seasonal garden shop.

Planters' Choice *in Newtown, CT (planterschoice.com)* is a local grower and wholesale nursery. Landscape professionals with an account there can source plants from Planters' Choice. Several local organizations and clubs also have accounts. Planters' Choice has always offered native plants and many "nativars," but they have increased their inventory of natives in recent years. We recommend requesting straight species, since studies show they provide the most wildlife benefit. Planters' Choice is also participating in the NOFA Ecotype Project, in which seeds are sustainably collected from the wild and then propagated, in order to ensure an ongoing healthy population of native plants.

Annual Native Plant Sales

Please check web sites for actual dates which do vary from year to year

Bartlett Arboretum & Gardens Stamford (*bartlettarboretum.org*), usually in May.

Audubon Greenwich *(greenwich.audubon.org).* Pre-ordering is encouraged; check website for plant lists and order form. Usually in May.

Menunkatuck Audubon Society Guilford *(menunkatuck.org)* Pre-ordering is encouraged. Usually third week in May.

Northwest Conservation District Earth Day Plant Sale Goshen Fairgrounds, Goshen. Usually in April close to Earth Day.

North Central Conservation District Plant Sale Tolland County Agricultural Center, Vernon and 4-H Education Center, Bloomfield. Usually early May.

Eastern Connecticut Conservation District Spring Plant Sale Ocean State Job Lot Building, Gales Ferry and Brooklyn Fairgrounds, Brooklyn. Usually mid-April.

Connecticut River Coastal Conservation District Plant and Seedling Sale Westbrook Outlets, Westbrook. Usually late April.

Go to conservect.org to link to individual districts and find plant-sale lists as well as information on pre-ordering. Sales dates are also available at each location.

This article (with some changes) appeared in the March 2019 issue of Connecticut Magazine. Edited by Mary Wilson

Native Plants on Display Seeing native plants in a setting all their own helps you to imagine how best these natives can be incorporated into your lawn and garden plans. You may find one of these sites to be close to home, or there may be a road trip involved. Either way, it is worth an outing to gain knowledge and to inspire your imagination. Have fun!

Bartlett Arboretum, Stamford, CT • **Richard Haley Native Gardens**, Pomfret Center, CT • **Highstead Arboretum**, West Redding, CT • **Earth Tones Nursery**, Woodbury, CT • **Hill-Stead Museum**, Farmington, CT • **Audubon Centers in CT**: Sherman, Milford, Southbury, Stratford, Greenwich, Sharon, Fairfield & Pomfret **Stonecrop Gardens**, Cold Spring, NY • **Westchester Community College Native Plant Center**, Valhalla, NY • **Garden in the Woods**, Framingham, MA **Berkshire Botanical Gardens**, Stockbridge, MA • **Tower Hill Botanic Garden**, Boylston, MA

For smaller gardens but perhaps closer to home, you can visit these native plant gardens established by Protect Our Pollinators in Newtown: **Tammy's Garden** (Fairfield Hills Campus), **Animal Control Garden** (21 Old Farm Road), **Fruit Trail Garden** marked as part of Pollinator Pathway (Fairfield Hills Campus), and the pollinator garden at **Cherry Grove Farm** (70 Platts Hill Road).

Connecticut Native Plants for Pollinators

Holly Kocet

PLANT NAME	TYPE	FLOWER COLOR	BLOOM TIME	HEIGHT	EXPOSURE/MOISTURE
Beardtongue *(Penstemon hirsutus)*	Perennial	Purple, pink	July-Aug	3'	Full-Part Sun /Low
Black Eyed Susan *(Rudbeckia fulgida)*	Perennial	Yellow	July-Sept	3'	Full Sun /Medium-Low
Blue False Indigo *(Baptisia australis)*	Perennial	Blue	June-July	6'	Full Sun /Medium
Blue Sundial Lupine *(Lupinus perennis)*	Perennial	Blue	May-July	3'	Full Sun /Medium
Blue Vervain *(Verbena hastata)*	Perennial	Blue	July-Aug	5'	Full-Part Sun /High
Boneset *(Eupatorium perfoliatum)*	Perennial	White	July-Aug	5'	Full-Part Sun /High
Bottle Gentian *(Gentiana clausa)*	Perennial	Blue	July-Sept	2'	Full-Part Sun /High
Butterfly Milkweed *(Asclepias tuberosa)*	Perennial	Orange	July-Aug	2'	Full Sun /Low-Medium
Calico Aster *(Symphyotrichum lateriflorum)*	Perennial	White, purple	Sept-Oct	3'	Full-Part Sun /Medium
Cardinal Flower *(Lobelia cardinalis)*	Perennial	Red	July-Sept	4'	Full-Part Sun /High
Coneflower *(Echinacea purpurea)*	Perennial	Pink	July-Oct	6'	Full-Part Sun /Medium
Culver's Root *(Veronicastrum virginicum)*	Perennial	Purple, white	July-Aug	6'	Full Sun /Medium-High
Cut-leaf Coneflower *(Rudbeckia laciniata)*	Perennial	Yellow	July-Sept	7'	Full-Part Sun /Med-High
Evening Primrose *(Oenothera perennis)*	Perennial	Yellow	June-Aug	3'	Full Sun /Medium
Golden Alexander *(Zizia aurea)*	Perennial	Yellow	May	3'	Part Sun /Medium-High
Gray Goldenrod *(Solidago nemoralis)*	Perennial	Yellow	Aug-Oct	2'	Full Sun /Low
Joe-Pye Weed *(Eutrochium maculatum, fistulosum)*	Perennial	Pink	Aug-Sept	8'	Full Sun /Medium-High
Narrowleaf Mtn. Mint *(Pycnanthemum tenuifolium)*	Perennial	White	July-Aug	3'	Full-Part Sun /Low-Moist
New England Aster *(Symphyotrichum novae-angliae)*	Perennial	Purple, yellow	Aug-Oct	6'	Full Sun /Medium-High
New York Ironweed *(Vernonia noveboracensis)*	Perennial	Reddish purple	July-Sept	6'	Full Sun /High
Slender Goldenrod *(Solidago erecta)*	Perennia	Yellow	July-Aug	3'	Part Sun /Low
Sneezeweed *(Helenium autumnale)*	Perennial	Yellow	Aug-Sept	6'	Full Sun /Medium
Spiderwort *(Tradescantia ohiensis)*	Perennial	Blue	July-Aug	3'	Full Sun /Medium
Sunflower Everlasting *(Heliopsis helianthoides)*	Perennial	Yellow	July-Aug	6'	Full Sun /Medium
Swamp Milkweed *(Asclepias incarnata)*	Perennial	Pink	July-Aug	5'	Full-Part Sun /Med-High
Threadleaf Tickseed (*Coreopsis verticillata)*	Perennial	Yellow	June-July	3'	Full Sun /Medium
White Turtlehead *(Chelone glabra)*	Perennial	White	Aug-Sept	3'	Full Sun-Part Shade /High
Wild Bergamot *(Monarda fistulosa)*	Perennial	Purple	May-July	4'	Full-Part Sun /Medium
Wild Geranium *(Geranium maculatum)*	Perennial	Pink	April-May	3'	Sun-Part Shade /Medium
American Hazelnut *(Corylus americana)*	Shrub	Brown, red	Mar-April	13'	Full-Part Sun /Medium
Bearberry *(Arctostaphylos uva-ursi)*	Shrub	White, pink	April-May	8'	Full Sun /Low
Black Willow *(Salix nigra)*	Shrub	White	April-May	15'	Part-Full Sun /High
Button Bush *(Cephalanthus occidentalis)*	Shrub	White	July-Aug	6'	Full-Part Sun /High
Common Ninebark *(Physocarpus opulifolius)*	Shrub	White	May-June	6'	Part Sun-Part Shade /Low
High Bush Blueberry *(Vaccinium corymbosum)*	Shrub	White, pink	May	12'	Full Sun /Med-High
Inkberry *(Ilex glabra)*	Shrub	White	May-June	7'	Full-Part Sun /Medium
New Jersey Tea *(Ceanothus americanus)*	Shrub	White	May-June	3'	Full-Part Sun /Medium
Pussy Willow *(Salix discolor)*	Shrub	Yellow, green	Mar-April	15'	Full-Part Sun /Med-High
Raspberry, blackberry *(Rubus spp.)*	Shrub	Purple, pink	July-Aug	4'	Part Sun-Part Shade /Medium
Shadblow Serviceberry *(Amelanchier canadensis)*	Shrub	White	April	20'	Full-Part Sun /Medium
Shining Sumac *(Rhus copallinum)*	Shrub	Yellow	May-June	6'	Part Sun-Part Shade /Medium
Steeplebush *(Spiraea tomentosa)*	Shrub	Pink	July-Aug	3'	Full Sun /High
Summersweet Pepper Bush *(Clethra alnifolia)*	Shrub	White	July-Aug	7'	Part Sun-Part Shade /High
Swamp Rose *(Rosa palustris)*	Shrub	Pink, yellow	May-July	6'	Part Sun-Part Shade /High
Virginia Rose *(Rosa virginiana)*	Shrub	Pink, yellow	May-July	6'	Full Sun /Low
Winterberry *(Ilex verticillata)*	Shrub	White	July-Aug	7'	Full-Part Sun /Med-High
American Basswood *(Tilia americana)*	Tree	Cream	July-Aug	80'	Full-Part Sun /Medium
Red Maple *(Acer rubrum)*	Tree	Red	April	60'	Part Sun-Part Shade /High
Redbud *(Cercis canadensis)*	Tree	Purple, pink	May	60'	Full-Part Sun /Medium
Sugar Maple *(Acer saccharum)*	Tree	Green	April	60'	Part Sun-Part Shade /Medium
Swamp White Oak *(Quercus bicolor)*	Tree	Red, green	May	60'	Part Sun-Part Shade /High

Heroes in the Garden—Beneficial Insects

Holly Kocet

What is a bug?

Many people refer to insects as "bugs." A bug or true bug is defined as any insect of the order Hemiptera (suborder Heteroptera) that have sucking mouthparts and forewings thickened at the base. The true bug develops through incomplete metamorphosis meaning its nymph stage resembles the adult bug. This is unlike butterflies and moths (order Lepidoptera) that transform into caterpillars (complete metamorphosis). Bees, flies, wasps, and beetles also completely change form from egg to larvae to adult.

Many true bugs are economic pests (i.e. chinch bug) but not all. The assassin bug for example is a beneficial insect that controls many agricultural pests. In reality, more than 90 percent of all insects are either beneficial or do no harm to plant, animal or human life.

Pollination Services

Insects like bees, flies, beetles, butterflies and moths are essential for pollinating the food we eat and ensuring the survival of our indigenous trees, shrubs and plants that in turn clean our water sources and the air we breathe. Additionally, these plants provide habitat for birds and wildlife.

Controlling Harmful Pests

Many insects, such as the ones described below are predators of harmful garden and agricultural pests. Eliminating these beneficial insects with pesticide applications only serves to eliminate the very creatures whose purpose it is to control harmful pests. Pesticides kill the beneficial insects but some pests, over time, develop resistance to a particular chemical. As a result, stronger and stronger formulations are needed to control them putting us and our children at even greater risk.

An attractive pollinator, the Harvester butterfly and her caterpillar who eats pesky aphids.

Food for Wildlife

Many insects are food for birds, amphibians and mammals. Many people consider moths and their caterpillars pests. In truth adult moths are a very important for both pollination services as well as in providing food for bats, martins, flycatchers, whippoorwills and other vertebrates. Moth caterpillars are enormously important to the food web supporting many animal species. These caterpillars are especially valuable as food for baby birds because they are soft, full of nutrients, and can be easily digested. Baby birds grow quickly so parent birds have the exhausting job of finding and feeding caterpillars for many weeks when babies are nesting and even after fledging the nest.

The Food Chain

Just as we do, insects need to eat. And, they eat plants. But in natural ecosystems they never become a problem because they are food for other insects, birds, amphibians, reptiles and mammals. Only when we unbalance the ecosystem by depleting habitat and misusing chemicals do they become problematic. It bears repeating that in nature and in our own yards the majority of insects are beneficial and do no harm. Furthermore, pests have to be numerous in order to cause damage to plants. Recognizing the good and the bad is essential.

Integrated Pest Management

Integrated Pest Management (IPM) is a widely accepted environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM's directive states that the least harmful method of controlling pests should always be considered prior to applying toxic substances. IPM does not condone the use of broad-spectrum insecticides. Mechanical methods such as hand picking or washing, row covers, and crop rotation are encouraged. Biological control using beneficial insects is a widely respected IPM method. It is important to know your plant, its pest and appropriate timing for control.

Pictured below are some very important insects for pest control. These are the "good guys." Protect them and allow them to do their job.

APHIDIUS WASP

Most aphidius wasps are about ⅛″ long and dark in color with clear wings. They do NOT sting.

Their name gives you a hint about who they eat. It's aphids. They are so scary to aphids that when they see the wasp, they often fall to the ground rather than be eaten.

ASSASSIN BUG

There are hundreds of species of assassin bugs throughout North America. They are usually brown or black with large bristly front legs. Most measure about ½″ long. They can bite if handled roughly.

They eat aphids, cabbage worms, beetles, cutworms, earwigs, four-lined plant bugs, Japanese beetle, lace bugs, Mexican bean beetle, tobacco budworms, tomato hornworms and many caterpillars.

BIG EYED BUG

Big eyed bugs are very small, measuring only ⅛″ long. They have wide heads with big bulging eyes. They are usually gray, black or brown with clear wings and their bodies are flattened.

Big eyed bugs help rid the garden of aphids, cabbage loopers, caterpillars, chinch bugs, flea beetles, Mexican bean beetles, spider mites, thrips, whiteflies, and many eggs of bad bugs.

DAMSEL BUG

Damsel bugs are dull brown, tan or gray with narrow bodies and a long curved "snout" and bulging eyes. They resemble small assassin bugs.

They eat aphids, tobacco budworms, cutworms, asparagus beetles, cabbage worms, Colorado potato beetle larva, four lined plant bugs, sawfly larva, spider mites, whiteflies, thrips, leafhoppers, and many insect eggs.

GROUND BEETLE

Ground beetles have shiny hard shells. They can be between ⅛″ to 1½″ long. Many of them are dark in color but a few are green, blue, gold or red. Most have large mouth parts called mandibles for capturing prey. They feed at night and hide under rocks and logs during the daytime.

Their larvae feed on many insect pests for several weeks before becoming adult beetles. They prey on slugs, root maggots, cutworms and other pest on the ground.

HOVER OR SYRPHID FLY

Adult hover flies look like small wasps with black and yellow stripes and a white belly but on closer inspection they have only two wings and large eyes as do all flies. They hover like a hummingbird. They can NOT sting. Adults range in size from ¼″ to ½″.

They are both important pollinators and predators of bad bugs. As larvae they can eat as many at 500 pests before becoming adult flies. Their larvae eat aphids.

GREEN LACEWING

Lacewings are beautiful, light green with very large transparent wings, long threadlike antennae and golden eyes. They can be up to 1″ in length.

As larvae they can eat up to 100 aphids per day, earning them the nickname "aphid lions." They also feed on scale insects.

Adult lacewings do not feed on insects. They eat nectar and pollen and "honeydew" produced by pests like aphids.

LADY BEETLE AND LARVA

Lady Beetles are ¼″ long with rounded bodies and black spots. Their wing covers are bright orange to red with white markings on their "shoulders." There are over 450 species of lady beetles found throughout North America and each species has a different number of black spots. Lady beetle larvae look like tiny colorful alligators.

Adult lady beetles and their larvae eat aphids, asparagus beetle, lace bugs, mealy bugs, Mexican bean beetle larvae, scale, thrips, spider mites, whiteflies, and many insect eggs.

MINUTE PIRATE BUG

Minute pirate bugs are very tiny, measuring only ⅛″. They are oval shaped and black color with white wing patches. They are very fast moving.

Adults and nymph pirate bugs help rid your garden of aphids, small caterpillars, lace bugs, Mexican bean beetle larvae, scale, spider mites, whiteflies and many insect eggs including tobacco budworm, cutworm, corn earworm.

PARASITIC WASP

Parasitic wasps do NOT sting. They usually measure between 1/32″ and ½″, though a few are larger. They look like they have a stinger but it is really and ovipositor, a part of the body that lays eggs.

Parasitic wasps rid your garden of aphids, beetle larvae, bagworms, cabbage worms, gypsy moth caterpillars, beetles including Japanese beetles, leaf miners, mealy bugs, sawfly larvae, scale, tomato hornworm, and many more.

DRAGON FLY

Dragon flies, Damsel flies, and their larvae feed on mosquitoes. Harmless to humans, they do not sting.

Damsel flies are small and slender bodied. They fold their wings above their abdomen when at rest. Skimmers are the largest and best known family of dragonflies. Most have patterned wings. Darners include the largest of our dragonflies, they have huge eyes and like to hang vertically.

TACHINID FLY

Tachinid flies are North America's largest and most important group of parasitic flies. They resemble small house flies and may be covered with bristly hairs. They can measure from ⅓″ to ¾″ in length.

They help rid your garden of many harmful caterpillars, beetles, and worms including Japanese beetles, sawfly larvae, squash bugs, tobacco hornworms, four line plant bugs, and more.

ROBBER FLY

Adult robber flies measure up to 1½″. Most are gray to black. They have an elongated body that tapers to the rear with bristled legs.

The catch prey on the wing. Adults and larvae eat Colorado potato beetles, four lined plant bugs, Japanese beetles and Mexican bean beetles.

LONG-LEGGED FLY

There are about 7,000 species of long-legged flies. They are small in size with colors ranging from metallic green, blue, copper, and bronze.

They can be seen darting across leaves feeding on mites, aphids, and tiny larvae.

FIREFLY

Fireflies, AKA Lightning bugs, are neither flies nor bugs. They are actually beetles. Their glow is produced in a chemical reaction caused by an enzyme. No heat energy is lost from their bodies when producing their glow.

Firefly larvae are predators of snails and slugs.

SOLDIER BEETLE

Soldier beetles, AKA leatherwings, are abundant on flowers and foliage. They have soft wings and are good fliers.

Valuable as pollinators, they eat many aphids and larvae of other insects. The goldenrod soldier beetle feeds on root maggots and corn earworm.

SPIDER

There are 38,000 species of spiders in the world. They are not an insect but an arachnid, as they have eight (8) legs (insects have only six). Spiders can be brown to white or yellow and can have many patterns of bright colors. Some are hairy and some are smooth. They have excellent hearing, sense of smell and touch.

Many are not discriminating eaters and will readily capture beneficial insects and pests.

DADDY LONG LEGS

Harvestman, AKA Daddy Long Legs are classified as arachnids of the order *Opiliones*. Contrary to urban myths, they are not venomous. They prey on insects and other arthropods. They also scavenge dead insects and drink plant juices.

SIX SPOTTED TIGER BEETLE

There are more than 2600 species of tiger beetles in North America. They work during the day as opposed to ground beetles who work the night shift. They are swift hunters and beneficial predators of pest insects. Some are endangered due to habitat destruction.

One species, the six-spotted tiger beetle is abundant in spring on forest paths. He is a striking metallic green color with six white spots on his sides.

SPINED SOLDIER BUG

The spined soldier bug (genius *Podisus*) is a predatory stink bug that feeds on a wide variety of field and garden pests including Mexican bean beetle, Colorado potato beetle and imported cabbageworm as well as sawfly larvae and grubs.

The spined soldier bug resembles the pest stink bugs, especially the Marmorated stink bug, but can be identified as a "good guy" by the large spikes on his "shoulders."

NOTE: Many stink bugs are damaging to plants but our native stink bugs are kept in check by natural predators such as birds, frogs, parasitic wasps, and spiders.

Large populations of stink bugs, especially those found in your home in late winter, are brown marmorated stink bugs (*Halyomorpha halys*). This pest was accidentally introduced to America. He hails from China, Japan, the Korean Peninsula, and Taiwan.

photos in this article credited to bugwood.com

The Importance of Leaving the Leaves

Lawrence Zankel

When it comes to gardening, I don't play by the rules. At least the rules that suburban homeowners were given. We were all told to keep our yards neat and tidy. That meant a yearly fall clean up of the leaves after they have completed their autumnal dance of falling to the ground.

I love gardening and one of the main contributing factors to the health of my garden is the fact that I let the leaves be. There are several important reasons to leave them alone and not rush to banish them from your yard and property as soon as they drop. They provide shelter during the winter. Leaves act as a cost effective compost and mulch. Finally, the way many people remove them creates unnecessary environmental challenges. I am referring to the needless overuse of leaf blowers.

Leaves provide shelter for overwintering native butterflies in various stages of their life cycle. Some overwinter as eggs, while others may do so as caterpillars or in their chrysalis form. They also aid the many species of native ground nesting bees. We need to do everything in our power to help protect our pollinators. Leaving the leaves is one way to do this.

One of the easiest ways to improve your garden is to improve the quality of the soil. A simple way to do this is to use the leaves to create a nutrient rich compost. In the fall, you can move some leaves from your yard to a designated area. I always leave them alone as they collect in my beds. When spring arrives, it's time to mow the gathered leaves and use them in the garden to make your plants extra excited to burst through the earth!

Many homeowners use leaf blowers to remove the leaves and they create a tremendous amount of both noise and air pollution. They also disturb the numerous beneficial creatures that may have overwintered in the leaf piles. It's best practice to say no to leaf blowers.

I hope you now realize the positive impact you can have on our precious pollinators by taking a few easy steps while saving valuable time and money.

Additional Information: http://www.leaveleavesalone.org

Gardens and Wildlife—Not Always a Happy Combination

Adria Henderson

Always have respect for wildlife even if you don't want to share your garden flowers and plants with them. If you enjoy seeing them, it may be a fair trade to supply a little pleasure (food) for them. And remember that there are non-toxic and humane ways to prevent plant damage.

After spending much time and effort to design and plant your vegetable and flowers gardens, it's disconcerting to walk out in the morning only to see new shoots cut off at ground level, newly-planted vegetable plants toppled, and just-opening flowers and buds neatly snipped off.

With the abundance of wildlife in our state, Connecticut vegetable and flower gardens are a virtual buffet of tasty treats for garden wildlife. This is especially true in the smaller towns and rural areas, although city dwellers are not immune to garden invasions–think birds, neighbors' cats, squirrels and other rodents.

Although we are lucky enough to have a close-up view of the antics and lifecycles of rabbits, voles, groundhogs (woodchucks), deer, chipmunks, squirrels and voles, these same creatures are the "convicted felons" of flower and vegetable garden plots as they chomp on leaves, fruits, mature vegetables, and the leaves, buds and bulbs of flowers. ***Chemicals, kill traps and other poison applications are not necessary to control wildlife*** as there are many natural, tried-and-true control methods in your garden.

Prevention May Be the Key

It only takes a season or two to understand which plants in your yard or garden are at highest risk from wildlife snacking. So, it makes sense to evaluate your priorities. Would daffodils be a good substitute for tulips when you know that something eats the tulips every spring? Do you really need all those hostas, or maybe they could be replanted to a location less likely to be nibbled on. And ultimately how much do I want to "fight" with those with whom I am sharing this space on earth?

Thus, picking plants which are relatively resistant to deer or other wildlife can go a long way to minimize aggravation. *See lists of deer-resistant native plants on page 17*. Other suggestions as listed below include judicious use of fencing and occasional blasts of repellents on defenseless plants.

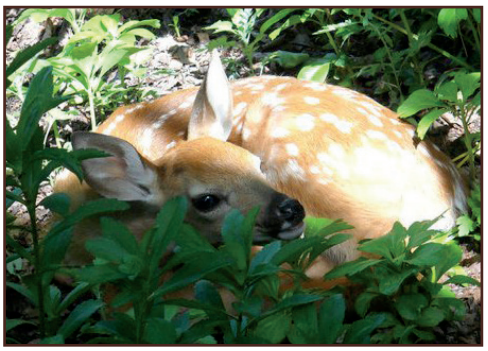
Furthermore, you may need to identify the culprit before you can take defensive measures. Clues can be whether the cut was ragged or clean, the height at which the damage was observed, and knowing what types of plants a particular species prefers.

A more scientific method is to sprinkle flour around a potential target plant and in the morning look for footprints! Not only is this fun (children love it), but you may be surprised at what you find. One gardener was sure that deer were eating a particular perennial, only to find her perennial remnants, having neatly been severed by a weed whacker, in the pile of debris left by her groundskeeper. In this case you would need a footprint of your human helpers!

To identify specific animal footprints, go to google.com then put in suspected animal for verification. For example, type "deer footprints" and chose Images. Results will show tracks on ground, on snow, relative size of prints, etc.

SPECIFIC WILDLIFE & DETERRENTS

DEER



The animal that generates the most complaints by far about damage to garden and yard plants is deer. Deer live at the edge of the forest (the ecotone), close to agricultural and residential areas where browsing is handy, and of course suburbanites have provided a great variety of plantings that are there for the taking.

Deer have adapted to eating many native and non-native species. However, in general, they do not like fuzzy, spiny, thorny or prickly growth, but if hungry enough, will eat almost anything. Much damage can take place when winter snow cover has reduced food availability.

Identifiers: Eats plants or plant parts with some discrimination; bites are ragged; grazing on shrubs and trees is high (a foot or more from ground).

Diet: Devours many parts of flowers and ornamental plants. Yews, hostas and lilies are particularly vulnerable. (*See deer-resistant plant list on page 17)*

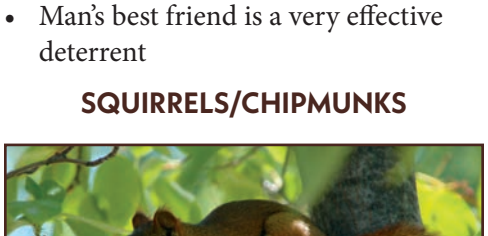
Deterrents:

- Fencing—at least 5 feet or electric
- Commercial deer repellents such as Bobbex, Deer Out, Deer Stop. Look for products made with natural

components. Most should be reapplied after a rain.

- Home-made repellents *(recipe on page 17)*
- Coyote urine, blood meal, human hair, dog hair
- Motion detector lights
- Timed sprinklers
- Hot pepper spray; home-made dairy & egg solutions *(recipe on page 17)*
- Scarecrows
- Hanging bars of soap (Irish Spring) or other strong deodorant soap
- Athlete's foot powder or baby powder sprinkled on a cotton cloth
- White bags or strips of white material hung on stakes
- Avoid heavy fertilizing—apparently the odor is an attractant
- Man's best friend is a very effective deterrent

SQUIRRELS/CHIPMUNKS



Identifiers: Flower bulbs and/or plant shoots uprooted

Diet: Most fruits such as strawberries, tomatoes, and nuts. Feeds early morning or dusk.

Deterrents:

- Fencing—bottom should be buried at least 12″
- Motion detector lights or sprinkler
- Wire cloche around specific plants
- When planting bulbs, lay a piece of screening over the bed, cover with ¼″ soil and remove once ground has settled
- Squirrel baffles for hanging planters
- Hot pepper spray *(recipe on page 17)*
- Hanging bars of soap (Irish Spring)
- Remove yard debris where they may nest
- Scarecrows
- Plant aromatic plants and herbs, i.e. basil, garlic, etc.
- Plant lots of daffodils—it is the one bulb squirrels won't touch

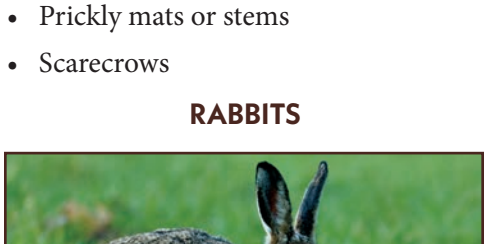
CATS

Identifiers: Signs of digging with small piles of soil.

Deterrents:

- Small pots of catnip outside garden area will keep cats busy and out of garden plots
- Prickly mats or stems
- Scarecrows

RABBITS



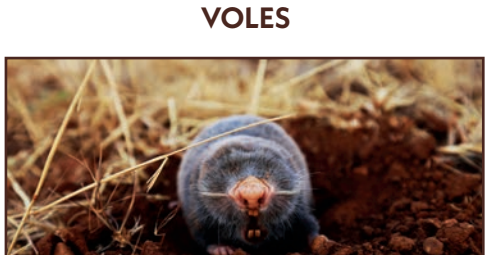
Identifiers: New growth cut off close to ground; clean edge cut on foliage, sometimes at an angle; nesting area nearby.

Diet: Vegetables, flowers, bushes, woody plants including young trees

Deterrents:

- Feeding station away from garden (they love apple slices)
- Raised garden beds
- Motion detector lights
- Fencing, bottom needs to be buried at least 12″ down
- Timed sprinklers
- Hot pepper spray
- Plant marigolds around the garden

VOLES



Identifiers: Tunnels in lawn areas; damage to trees and shrubs near ground leaving ¼″ grooves in the wood

Diet: grass and roots, bulbs and tubers, bark of small trees and shrubs

Deterrents:

- Sprinkle Bon Ami cleansing powder into holes before planting bulbs
- Remove wood piles and other debris from your yard
- Remove bird feeders which are an attractant

WOODCHUCKS

Identifiers: Trampled plants, burrows nearby

Diet: Corn, beans, peas, tender veggies

Deterrents:

- Motion detector lights
- Timed sprinklers
- Hot pepper spray
- Man's best friend

Home Made Deer Repellents Mary Wilson

"While many commercial deer repellents are available, you may want to brew up your own. Deer are known to have a keen sense of smell, so be sure to include some very stinky ingredients!"

Dairy Does It

Mix together:
1 egg, ½ cup milk, 1 tablespoon cooking oil, 1 tablespoon dish soap

Add to 1 gallon of water and shake vigorously. Let it sit for a day or two. Then spray on plants every two weeks or immediately after heavy rains. (This one I have used and can vouch for its effectiveness).

Spicy Stench

Blend together:
6 eggs, 4 hot peppers, 6 to 12 cloves of garlic and 5 cups warm water.

Leave mixture in the sun for several days. If used as a spray you will need to strain it well. Cheesecloth or panty hose work well. Otherwise, it can be poured directly around and on plants to keep deer away.

Deer Buster Egg Brew

Similar to the one above without the need to strain

Put in blender:
2 eggs, 2 cloves of garlic, 2 teaspoons Tabasco sauce, 2 teaspoons cayenne pepper and 2 cups water.

Blend and allow mixture to set for two days. Then spray on and around plants.

Source for the last two recipes: Jerry Baker, "Giant Book of Garden Solutions," American Master Products, 2003

15 Great Deer-Resistant Native Plants

Jennifer Benner, Audubon Connecticut Contributor & Co-Author of The Nonstop Garden

Beautify the landscape and fill garden gaps with these less palatable native plants that Bambi tends to avoid.

If you live in Connecticut, you're no stranger to the challenge of deer browse — shrubs transformed into botanical lollipops and perennial beds mowed down overnight. The result is the reduction of plant cover, biodiversity, and food sources for birds and other wildlife. One good strategy is to plant native plants that deer find less palatable. Consider some of these gems the next time you have a garden gap to fill or are just looking to add beauty to your yard.

1. **Black Cohosh**
   perennial, partial to full shade
2. **Wild Columbine**
   perennial, full to partial shade
3. **Wild Ginger**
   perennial, partial to full shade
4. **Butterfly Milkweed**
   perennial, full sun
5. **Pennsylvania Sedge**
   grass, full to partial shade
6. **Summersweet**
   shrub, full sun to partial shade
7. **Sweetfern**
   shrub, full sun to partial shade
8. **Red Twig Dogwood**
   shrub, full sun to partial shade
9. **Hay-scented Fern**
   perennial, full to partial shade

   Best for mass plantings or areas you wish to colonize with one plant. This robust native fern is great for filling in big areas & drowning out weeds.
10. **Wild Geranium**
    perennial, full sun to partial shade
11. **Winterberry**
    shrub, full sun to partial shade
12. **Switchgrass**
    grass, full sun
13. **Little Bluestem**
    grass, full sun
14. **New England Aster**
    perennial, full sun to partial shade
15. **Foamflower**
    perennial, partial to full shade

NOTE: *In addition to this list, members of Protect Our Pollinators have found the following natives to be relatively safe from deer browse: Penstemon, Bee-balm, Baptisia, Cardinal Flower, Yarrow, Evening Primrose, Golden Alexander, Goldenrod, Joe-Pye Weed, Mountain Mint, Coreopsis, Turtlehead, Inkberry, Bayberry, Pussy Willow, Steeplebush, and Swamp Rose.*

Hazards in the Garden—Ticks, Poison Ivy and Fleas

Deb Osborne and Mary Wilson with additions from Adria Henderson

Hazards in life are not necessarily a bad thing. They give us a chance to be creative and make informed choices. And by doing so, we are demonstrating respect for the natural way of the world and our place in it.

Gardeners are lucky people as they have a focused interest with the side benefits of fresh air, exercise, and the satisfaction of creating something worthwhile. Gardening is a particularly good hobby at this time when we may be "sheltering at home." However, the yard does offer some hazards.

TICKS: Concern about ticks and the various diseases they can spread is a very real issue for residents of this part of the country. Often the first response may be, "What can I spray to keep my family safe?" Before making any choices, consider various strategies including personal protection, yard modifications, and biological controls.

By far the most effective and least expensive thing you can do is to be vigilant about personal protection including body checks, wearing light colored clothing, showering immediately after working outdoors, and keeping pets out of areas where ticks may be present.

Yard modifications include removal of any barberry (a very attractive place for ticks to reside), eliminate or reduce ground covers, develop a border of wood chips between lawn and woods, and move children's play areas away from wooded areas.

Tick Boxes, not tick tubes, are a safe alternative to control ticks in your yard. These boxes are installed by a professional and can significantly reduce tick populations in your yard. Information can be found at *www.tickboxtcs.com*.

Botanical repellents such as cedar wood oil and garlic oil may be safer than chemical compounds, but usually are less effective. Most have not been tested for effectiveness and/or toxicity to bees.

Do not spray with toxic chemicals, especially carbamates (Sevin), pyrethrins, or pyrethroids. These compounds can be toxic to beneficial insects including bees, fish, cats and other aquatic organisms. Remember, there are other alternative strategies!

POISON IVY: For those of us who have sensitivity to this plant (85% of the population), it is important to be able to recognize the **Leaves of Three** in various seasons.

SPRING: Poison ivy in spring has a surprising red color. It is important to recognize it at this stage, when you are apt to be in the yard doing spring clean-up activities.

SUMMER: The old song "Leaves of three, let it be" applies here. The shiny green leaves can be found growing on the ground but also frequently climbing up and into trees, on fence posts, etc.

FALL: Poison ivy takes on a bronze hue but don't let the pretty fall color fool you.

You may very well want to spray this plant with the handiest and deadliest commercial product you can find. Try to resist that urge! It is inconsistent with your desire for a healthier and "greener" life style. And, the most common poison ivy killer, glyphosate, poses multiple dangers to human health and the environment. Consider making your own concoction and/or manually pull the plants.

To make a home-made poison ivy killer spray, combine 1 cup of salt and 1 gallon of vinegar in a pot and carefully heat to dissolve the salt. Allow it to cool, then add 8 drops of liquid dish soap and put the mixture in a spray bottle. You can spray the poison ivy or pour it directly on the plant.

Tips for plant removal, either before or after spraying: If you have plastic bags that are used for delivery of a newspaper, use one on each hand or better yet use multiples per hand. This way when you remove a plant or part of a plant you can peel off one bag with each removal. Try to remove the whole plant—leaves, stems and root. Of course, wear long pants and long sleeves and gloves. Be sure to wash all clothing afterward.

Relief from itching: If you do get "hit" there are some good products on the market to relieve itching including TecNu, Ivarest (a cleansing foam), and Ivy Block (by SkinSoSoft, a preventative).

And if you happen to have a goat handy, they adore eating poison ivy—without any side effects!

FLEAS: Most pet owners are well aware that fleas can be a nuisance as well as a health problem for our pets. As much as we want to be rid of these pests, it may take a combination of strategies and a little effort on our part to be flea-free.

It is important that we should be very careful about any chemicals to be put directly on our pets. Many commercially-available flea killing products contain chemicals which we would not use in our own gardens or yards—things such as imidacloprid (Advantage), fipronil (Frontline), carbaryl, Sevin, methoxychlor and malathion. Although manufacturers will tell you that these products are safe, more and more studies show a correlation between pesticides and canine cancers as well as long-lasting health problems such as nausea, skin inflammation and rashes, eye irritation, and the onset of frequent respiratory problems. And a recent study done in Great Britain cites water pollution issues stemming from pesticides in flea prevention products.

So where did these pests come from? Maybe other dogs, but once established, they will live and breed in your house and in your yard. Your lawn creates a comfy environment for fleas to feed, breed and lay eggs as do carpets and upholstery in the house.

In the yard: Flea larvae avoid light, so rake grass and thatch and keep grass mowed. Watch any damp and shady areas. Mulching with cedar, an effective flea repellent, will help. The majority of fleas will be within 50 feet of your dog's favorite resting spot, so focus on that general area.

There are some biological controls for fleas. Nematodes that may be applied to your lawn eliminate grubs also eat flea eggs, especially in damp weather. And as always, lady bugs are our friends as they eat fleas, as many as 50 fleas a day.

In the house: Because flea eggs can remain viable for up to two weeks, you may want to vacuum and wash hard surfaces often or even daily. Sprinkle some non-toxic flea powder in your vacuum bag to kill them once they have been captured. Or empty the bag or receptacle after each use into a sealed bag for disposal. Also wash your pet's bedding in hot soapy water at least once a week during flea season.

On your pet: Be wary of commercial flea collars since many contain pesticides that could be a problem for your pet or the environment. Read labels carefully. If you can't pronounce the ingredient, it is probably best to leave it there.

A number of good natural products are available. Among them are 1) Nature's Protection which uses cedar as the repellent, effective against fleas but not ticks, 2) Vet's Best, a non-toxic spot application, 3) the Wondercide line which contains cedar oil and lemongrass, 4) Natural Pet All-In-One, flea powder made from calcium carbonate, geraniol, and peppermint oil.

Diatomaceous Earth, food-grade only, can be used as a flea powder to be rubbed onto your pet's skin, keeping it away from your dog's eyes, nose and mouth. (Licking any non food-grade product from fur or paws can be dangerous and cause lung damage.) Also, food grade Diatomaceous Earth can be given as a food additive.

Applying essential oils like rose geranium oil to your dog's collar can be very effective. Do not use on cats.

NOTE: Be aware that individual dogs may have specific sensitivities to products. Watch your pet for any adverse reaction.

An innovative line from SHOO TAG is a card with a magnetic strip that emits an insect-repelling frequency. No harmful chemicals and no batteries.

A good non-chemical way to reduce fleas and ticks is to roll a sticky lint roller on your pet's body as soon as the pet comes inside. Then follow up with a flea comb to remove any insects that were not at the surface. This method works best on short to medium length fur.

Depending on how your pet tolerates bathing, there are a number of bathing options, the easiest one being just water and a mild dish soap.

Flea Sachet: If your pet does not like to be bathed, try filling a simple bag with lemon peel, dried lavender buds, and cedar chips. Tie bag up and put it near your dog's sleeping area.

Inner Defense: Healthy pets are less likely to attract fleas. Eating a diet with no by-products, unnamed meat, chemical preservatives, or other additives will make your pet less prone to fleas and other disorders. Also, garlic and Vitamin B added to your pet's food seems to make them less attractive to fleas.

Healthier Pest Control

PEST PREVENTION

- Remove Japanese Barberry and yard debris to discourage rodent nesting for tick prevention.
- Remove standing water to reduce mosquito populations.
- Keep plants and soil healthy. Healthy plants can resist and recover from pest damage. Native plants have the ability to thrive in your area and require less water once established. Choose the right plant for the right spot. Look for pest-resistant cultivars.
- Welcome natural pest enemies in your garden like lady beetles, toads, dragonflies, and others.
- Mowing your lawn a little higher will make it thicker and healthier which will crowd out weeds and make it more drought resistant.

MAKE SURE YOU HAVE A PROBLEM

- A bug on a plant doesn't mean you have a problem. Many insects are beneficial and are not pests. Learn to identify the "good guys."
- Many butterfly caterpillars are large and colorful. While they do eat foliage, they mature quickly and do not harm plants.
- The presence of a pest species does not mean you have a problem. Pests have to be abundant enough to cause damage.
- Tolerate other plants in your lawn. Many low-growing wildflowers like clover can tolerate mowing and are beneficial to pollinators.

Check out these websites for other helpful resources: *www.beyondpesticides.org* *www.xerces.org* *www.FOE.org*

PESTICIDES (insecticides, rodenticides, herbicides, fungicides) SHOULD ALWAYS BE A LAST RESORT.
NEVER USE BROAD SPECTRUM INSECTICIDES.

USE LESS TOXIC OPTIONS...

BIOLOGICAL CONTROL

Learn to identify the "good guys" and let them do their job:

- Lady beetles eat aphids, and green lacewing larvae feed on soft-bodied insects, mites, and insect eggs.
- Spined soldier bugs, spiders, predatory mites, and many nematodes are also beneficial "allies."

INSECTICIDAL SOAPS

Effective against whiteflies, aphids, mites, and thrips—but **TAKE CAUTION not to use insecticidal soaps on butterfly caterpillars.** Also, many plants are sensitive to insecticidal soaps.

NONTOXIC BAITS, TRAPS & LURES

- Trap whiteflies and aphids with yellow sticky cards, a very effective method since these insects are attracted to color.
- Slugs can be trapped with a saucer of beer.

PHYSICAL METHODS OF PEST CONTROL

- Pick or wash bugs off plants.
- Use floating fabric row covers to keep pests out of gardens.
- Pull weeds by hand before they set seed.
- Mulch gardens to prevent weeds.
- Remove all Japanese Barberry which attracts mice and ticks.

NONTOXIC SUBSTANCES & HEAT

- Garlic-based tick spray and MET-52 are alternatives to bee-killing Pyrethroids.
- Apply corn gluten meal to turf grass in early spring & fall to prevent germination of crabgrass and weeds.
- Weed killer: 1 qt. vinegar, ¼ cup salt, 2 tsp. dish soap.
- Sprinkle diatomaceous earth around foundations and entryways for nontoxic control of ants.
- Whole milk and water (1:2) as preventative for powdery mildew.
- Kill weeds in driveways and walkways with a propane torch.

MICROBIAL PESTICIDES

- Milky spore is effective in controlling Japanese beetle grubs.
- *Bacillus thuringiensis galleriae* (Btg) controls many grub species.

HORTICULTURAL OIL SPRAYS

Use to control aphids, mites, scale insects, whiteflies and other pests. **USE WITH CAUTION** as these oils are nonselective and will kill beneficial insects.

BOTANICAL INSECTICIDES

Many naturally occurring plant extracts have insecticidal properties. They vary in toxicity to humans and non-target organisms. **USE WITH CAUTION** as immature insects, including beneficials like butterfly caterpillars, are extremely sensitive to extracts like Neem.

Do not apply any insecticide when pollinators are active and flowers are present, or when it is windy.

Lawns: Perspectives—Old and New

Mary Wilson and Jackie Gaudet

Lawns have become the largest, most toxic "crop" in the U.S. Huge amounts of resources are used to maintain these large tracts which are essentially environmental wastelands. New paradigms suggest better ways to manage our resources.

Lawns have become such a part of the American scene that we seldom think about their usefulness or even their necessity. We do like having that verdant background to frame our house and garden areas, as well as having a place for our children and pets to play. And so we mow, water, fertilize and apply pesticides as Americans have been doing for many decades. And yet, we hear whisperings in the wind that maybe lawns are less than environmentally sound. New words have crept into our world like "biodiversity" and "sustainability." Does this messaging make us a bit uncomfortable? As much as we may not like change, it may be time to take a fresh look at that neatly mowed area of turf grass surrounding our homes.

A Little History

As we do an evaluation of lawns, it may be instructive (or at least interesting) to consider the history of how we got to this point. Early in history, short grasses over large expanses made it easier for us to see attacking animals and people. Eventually walls and fortresses provided that element of safety, so turf grass sprouted into a position of privilege and leisure. Wealthy Europeans developed large lawns as a form of conspicuous consumption, signs that their owners could afford to dedicate grounds to aesthetic, rather than agricultural purposes. In the New World Thomas Jefferson was one of the first to follow the European model, surrounding Monticello with expanses of neatly cut grass, an example of what might be the ambitions of a newly formed nation.

As the nation expanded, lawns became symbols of American entitlement and triumph. The advent of the motorized lawn mower and improved seeds and fertilizer further made lawn care easier and more accessible as suburbs developed. Lawns adjacent to the neighbors' lawns began to create a visually unifying effect, suggesting a sense of structure and calm. And yet beyond the calmness lurks the pressure to maintain and conform, keeping up appearances for the sake of the neighborhood.

And maintaining that lawn is not an easy task. After all. grass is stubborn stuff. And actually our current lawn care practices work against its DNA. As Paul Robbins says, **"We don't let grass get tall enough to go to seed, but we also water and fertilize it to keep it from going dormant. We don't let it die, but we also don't let it reproduce."**

What then are the downsides to maintaining all those lawns?

OVERUSE OF PESTICIDES

A staggering amount of pesticides are used on lawns. Homeowners typically use 10 times the amount of pesticides and fertilizers per acre on their lawns as farmers do on crops. Thus our **lawns have become the largest, most toxic 'crop' in the U.S.** Regular pesticide applications **damage soil health** by affecting the soil's living organisms–important soil microbes, earthworms, etc as well as beneficial insects.

For a list of lawn chemicals to be avoided see page 4, after article on Pesticides.

CHEMICAL FERTILIZERS ARE NOT THE ANSWER

Chemical fertilizers feed the plant but do nothing for the soil. Resulting shallow roots are more susceptible to draught, insect damage, etc. Also, fertilizers are very apt to run off into local waterways, causing algae blooms in lakes and ponds, making it difficult for aquatic species to survive.

HUMAN HEALTH CONCERNS

According to Beyond Pesticides, of 30 commonly used lawn pesticides:

- 13 are probable or possible carcinogens
- 13 are linked with birth defects
- 21 with reproductive effects
- 15 with neurotoxicity
- 26 with liver or kidney damage
- 11 have the potential to disrupt the endocrine (hormonal) system.

Children and pets are of special concern because of their smaller sizes and the fact that they often play in the yard where chemicals have been applied. Many of these chemicals can also be tracked into the house or the car where they can persist for days. Dogs are at significantly at higher risk of canine malignant lymphoma and canine bladder cancer, particularly if exposed to the herbicide 2,4-D, commonly used in products such as Weed'N'Feed. This type of formulation has been banned in most of Canada and elsewhere, but is readily available in the U.S.

INSECTS, POLLINATORS, BIRDS AND OTHER SPECIES AT RISK

The more we learn about the world around us, the more we realize how all species are interdependent. This interconnectedness is what makes pesticide use so concerning. When we kill off one species, we are most likely affecting other species in the habitat. Insects, pollinators and birds are particularly at risk, and all of these have been in decline for years. While we know that insects are the very important basis of many food chains (think baby birds), it is alarming that studies have shown **a loss of more than half of our insects since 1970**. And if you are trying to encourage pollinators to your yard, you certainly do not want to attract them only to be greeted with toxic conditions.

HUGE AMOUNTS OF WATER USE

Scientists estimate that lawns in the U.S. cover 3 times the area of any other irrigated crop. As of 2005 turf grasses—vegetables that nobody eats—were the **single largest irrigated crop in the country**. And with rising temperatures and draught conditions increasing in recent years, water usage will be a critical issue in the near future.

GAS POWERED LAWN EQUIPMENT USE CAUSES AIR POLLUTION

Such equipment is responsible for millions of tons of air pollutants, **up to 45% of all non-road gasoline emissions**. Such emissions can be harmful to anyone with respiratory conditions, and the resulting noise is in itself at minimum a nuisance, and at worst a hazard.

IT'S A NEIGHBORHOOD PROBLEM

There is no testing for the mix of chemicals which may be present, not just in your yard, but also in your neighborhood. What your neighbor puts down or sprays may very well affect the health of your yard and to those who use it. Outcomes are unknown and not predictable.

This uncertainty makes it even more desirable to work with nature, not against it. Much Western thought centers on man's desire to control his environment. Wouldn't it be better to see ourselves as part of nature and to work with it?

A WORD ABOUT BIODIVERSITY

Think of your flower or vegetable garden with its many different species. If your impatiens succumb to a particular pest or disease, you have lots of other plants which will survive and so the basic garden remains viable. Now think of your lawn—a monoculture—most likely having one dominant species of turf grass. If that grass experiences some stressor (draught, heat, insects, etc.) your lawn really suffers.

And that monoculture, your lawn, offers nothing of value to its surrounding environment. To the eye of a pollinator your lawn looks like a desert—no pollen or nectar to be found there.

WHAT ABOUT GLOBAL WARMING?

There is no doubt that we have experienced hotter and drier summers in recent years here in the Northeast. It is reasonable then to expect some stress to our lawns—thin spots and brown areas in your yard. Regular, deep watering may not be an option, especially if your water comes from your well.

Here in this region most grass seed mixes are cool-season grasses (Kentucky bluegrass, perennial ryegrass, fine fescue and tall fescue). These grasses are adapted to cold winter temperatures, but may not perform so well in the hot, dry summers of recent years.

Summer mowing should be done only when the grass is 2 ½ to 3 inches high. Taller grass blades help to shade the soil and help reduce water loss due to evaporation. Trim just a third of the lawn's total height. Leave the grass clippings as they will help to mulch the soil. Your lawn may change color but this is part of its survival mechanism. When the rains return the grass will green up again.

WHAT ELSE CAN YOU DO?

If you have a lawn which is problematic and requires too many resources, you do have some choices. You can **reduce the size of your lawn** by 1) letting part of it go natural, or 2) plant part of your lawn as a pollinator garden. Or you can try to **go organic with the lawn you have**. Organic lawns support healthy grass that is naturally resistant to weeds, pests, and other stressors.

Let's look at these two options first.

1. **Let part of your yard go natural**. By not mowing a section of your yard you may be surprised to find a number of wild flowers which were previously not seen. You are creating a mini-meadow, which you could augment by adding a few native plants. *NOTE: Any invasive plants should be identified and removed before they go to seed. See article on invasive plants for control methods.*
2. **Plant part of your lawn as a pollinator garden**. This could be done by expanding established flower beds using native plants which are most beneficial to pollinators and thrive with little no special care. Lists of native plants can be found with the article on Natives. Digging up lawn areas for new gardens is labor intensive. A good strategy is to place cardboard, newspapers or mulch over the new garden area in the fall. Digging in the spring will be much easier. Plan to have varieties which bloom at different times throughout the season. Plant flowers in groups rather than single species which makes it easier for pollinators to locate them and is also aesthetically more pleasing. Flowering trees and shrubs should be considered as well.

The other option, transitioning to a natural lawn care system, may be a multi-step process but worth the effort.

- **Have your soil tested** by a professional testing lab. This can be arranged for at the Stony Hill Extension Center in Stony Hill (Bethel). The cost is $8-$12, depending on what you want tested. This analysis will identify any adjustments to pH and nutrients that may be necessary. Keep a special eye on calcium levels which should be seven time higher than magnesium levels.
- **Aerate and de-thatch** to allow penetration of water and soil amendments. Compacted soil is also an invitation for weeds. If your lawn is too hard to stick a screwdriver in, it probably needs aeration, removal of small cores or "plugs" of soil, to allow air, water and nutrients to reach the roots of the grass. You may want to share the

photo by Dottie Evans

cost of an aerator with a neighbor, or use a simpler aeration tool available at most lawn and garden centers. De-thatch any areas where thatch has built up. Thatch is a dense layer of grass stems and roots on the surface of the soil. Thatch makes the grass susceptible to insects, disease and weather stress. In healthy lawns, earthworms and soil microorganisms break down the thatch.

- **Identify weed populations** and apply the appropriate amendments to alter soil conditions as needed. Several references can be found on the internet. A good one can be found at www.beyondpesticides.org, typing in Read Your Weeds in the search box. Another one, www.homestead.org, can be found by searching for Look to the Weeds. Remember that you may want to tolerate some "weeds" such as violets, clover, and dandelions as they provide nutrition to pollinators
- **Top dress** with a fine layer of compost at least once a year. Keeping a compost pile of your own is highly recommended. Spraying with compost tea several times a year also helps.
- **Mow high with a sharp blade**, and never remove more than one-third of the grass blade at a time. This promotes deeper root growth which makes the grass less vulnerable to drought and other stressors.
- When irrigating, **water infrequently but deeply** to promote deep root growth. Lawns need about one inch of water per week, including both rain water and irrigation. Watering early in the morning is best.
- **Leave grass clippings** on the lawn to return nitrogen to the soil. Mowed leaves in the fall can also be a good source of organic matter.
- **Fertilize in early fall, but go easy (based on soil test) and use organic, slow-release fertilizers**. You will be feeding the soil, not the grass. Thus it may take a little longer to see results because the soil's microorganisms need time to digest the nutrients.
- **Overseed** with appropriate grass seed in the fall. Make sure you use the right grass seed. Look for endophytic grass seed which provides natural protection against some insects and fungal diseases. Check to see the weed content of the grass seed and that there are no pesticide coatings. Consider adding white clover to your mix, for a built-in source of nitrogen.

BUT I STILL HAVE SOME WEEDS

Remember that your best defense against weeds is a thick healthy lawn which leaves little opportunity for weeds to become established. Getting to that point may take some time. Your regular routine of aeration, adding organic matter, and overseeding will help.

And remember that some weeds may be tolerated. Clover adds nitrogen to the soil while violets and dandelions provide pollen and nectar for bumblebees. Learn to appreciate the look of grass that is not manicured to the point of perfection. Save that for the golf courses. A little variety in the lawn can be viewed as a good thing.

Crab grass and some **other weeds** can be controlled by applying corn gluten meal to turf grass in early spring (when forsythia is in bloom) to prevent germination. Just don't do it when you are overseeding, since it prevents germination of all seeds, including grass seeds.

A few **isolated weeds** can be pulled by hand or try an **organic weed killer**, such as Nature's Avenger, a citrus oil based spray which dehydrates weeds down to the roots. Some gardeners swear by vinegar to do the same.

Extra aeration can help where weeds grow as a result of compaction. Crabgrass and other weeds often pop up in areas of high traffic along driveways and walkways.

Grubs (the larvae of Japanese beetles and several other beetles) can wreak havoc on a lawn. There are several organic options. **1) Milky spore** is a bacterium specific for Japanese beetles. The best time to apply is mid-August. **2) Nematodes**, microscopic worms that feed on grubs, can be watered into the soil. Nematodes are effective against all kinds of grubs. Late summer or early fall is the best time to apply nematodes. 3) A bio-insecticide call **GrubGONE** is now available and is effective against all grubs. (Do not confuse this with Grub-Ex, a Scott's product).

PREVENTION MAY BE CHEAPER

Remember that old saying that an ounce of prevention is worth a pound of cure. This is especially true for lawn care. If you have a healthy lawn which contains high organic matter and is teeming with biological life, you will be supporting healthy grass that is naturally resistant to weeds and pests. Initially creating a healthy lawn may be more expensive, but in the long term it will actually cost less. Your organic lawn will use less water, less fertilizer and will require less labor for mowing and maintenance. Fewer weeds and pests are a bonus.

CONCLUSION

Whether you chose to decrease your lawn area or chose to care for your lawn organically (or a combination of the two), the results will enhance the aesthetics of your yard as well as giving you the satisfaction of knowing that you have contributed to the greater good.

The elimination of chemical products promotes the health and well being of wildlife, the soil, water resources, your children, your pets and yourself. We are already assaulted by chemicals coming from sources over which we have no control. Why add to this burden when it is not necessary? Because of the extraordinarily large amount of acreage devoted to lawns in this country, **reduction or elimination of lawn care pesticides by the homeowner could have a huge impact on the overall reduction of chemical exposure**. If you are so inclined, please share this information with your friends and neighbors and we will be on our way to making change, one yard at a time.

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What Type of Tree Should I Try?

The type of fruit trees and various varieties is endless but we are only including those that would grow best in our region. When selecting a tree from a local nursery or mail order consider the earliest life of the tree. Has it been organically grown since propagation? If you start with a certified USDA Organic tree, you already have one significant advantage that it was never touched by toxic herbicides, pesticides or fertilizer. It will not be stressed due to an early life of synthetic food that causes unnatural growth spurts but with a slow, steady supply of naturally-occurring nutrients that the tree can take in as it requires. The long-term result will be a stronger tree with a healthier immune system.

To prevent disease, it's best to start fresh by planting new trees in new locations. New trees planted in an old orchard can pick up diseases left behind in the soil. You may want to select dwarf varieties since they are easier to prune, care for and monitor for diseases and insects.

Stark Bros. Nurseries recommends the disease-resistant varieties listed in each section here for the type of fruit tree. The fruit will set better if grown near another variety know to be a compatible pollinator, ideally, planted less than 50 feet apart. Bees help spread the pollen of one tree from bloom to bloom, helping fruit emerge, or bees carry the pollen from one tree to another tree, helping both varieties fruit. If you are planting multiple trees, space them at least 10-15 feet apart, measured from the trunks. Self-pollinating fruit trees include apricots, nectarines, peaches, and sour cherries; whereas fruit trees that require pollinators include apples, pears, plums, and sweet cherries. Your yield and size of fruits will be larger with proper pollination. Extension publications and nursery catalogs often include tables listing compatible pollinator varieties.

APPLES
Malus domestica

Apples are the most popular tree fruits because they are widely adapted, relatively easy to grow and routine palate-pleasers. The ideal soil pH for apples is 6.5, but apple trees can adjust to more acidic soil if it's fertile and well-drained. Ideally your soil should be tested and amended to adjust the pH. Most apple varieties, including disease-resistant 'Freedom' and 'Liberty,' are adapted to cold-hardiness Zones 4 to 7. Begin by choosing two trees that are compatible pollinators to get good fruit set. Mid and late-season apples usually have better flavor and store longer compared with early-season varieties.

Cox's Orange Pippin: A classic antique apple. Since its 19th-century discovery in England, this orange-red blushed variety has been inspiring apple lovers with its complex orange-mango flavor. Cold-hardy. Some resistance to mildew, fire blight and rust. Ripens in mid-September. Best organic pollinators: Cortland or Whitney Crabapple. Zones 4-8.

Cortland: Fruit's snowy center won't brown in salads. Very good in pies and cider. Cold-hardy. Some resistance to scab, fire blight and cedar apple rust. Ripens in mid-September. Best organic pollinators: Cameron Select™, Honeycrisp or Whitney Crabapple. Zones 4-6.

Liberty: A prolific bearer. Tree is low-maintenance due to its natural disease resistance to apple scab, cedar apple rust, fire blight and powdery mildew. Fruit has a yellow background with attractive red overtones, a crisp white flesh, and a harmonious sweet-tart taste. Perfect for fresh-eating, cooking, canning, or keeping–proper storage improves the flavor! Cold-hardy. Ripens in early September. Best organic pollinator: Cortland. A licensed variety of Cornell University. Zones 4-7.

Royal Empire: An improved Empire, deeper in color than the original. This apple has the sweetness of a Delicious and the flavor of a McIntosh. White-fleshed. Some resistance to mildew, fire blight and rust. Ripens in mid-September. Best organic pollinator: Liberty. A licensed variety of Cornell University. Zones 4-7.

CHERRIES
***Prunus avium* (sweet) and *P. cerasus* (sour)**

Cherries range in color from sunny yellow to nearly black and are classified in two subtypes: compact sweet varieties, such as 'Stella,' and sour or pie cherries, such as 'Montmorency' and 'North Star.' Best adapted to Zones 4 to 7, cherry trees need fertile, near-neutral soil and excellent air circulation. Growing 12-foot-tall dwarf cherry trees of either subtype will simplify protecting your crop from diseases and birds, because the small trees can be covered with protective netting or easily sprayed with sulfur or kaolin clay.

Stella: Productive tree yields abundant crops of plump, deep-red cherries. Good for fresh eating or canning. Resists cracking and is moderately disease-resistant. Ripens in June. Self-pollinating. Zones 5-8.

Emperor (Francis): Best picked fresh and popped in your mouth. Good for jams, jellies, canning, or homemade maraschinos. Ripens in late June. Crack-resistant. Best organic pollinator: Stella. Zones 5-7.

Lapins: Unusually meaty texture. A Bing-type cherry, with deliciously dark, reddish-black fruit. Good general disease-resistance. Ripens in late July. Self-pollinating. Zones 5-9.

PEACHES & NECTARINES
Prunus persica

Peaches and nectarines are on everyone's want list, but growing these fruit trees organically requires an excellent site, preventive pest management and some luck. More than other fruit trees, peach and nectarine trees need deep soil with no compacted subsoil or hard-pan. Peaches and nectarines are best adapted to Zones 5 to 8, but specialized varieties can be grown in colder or warmer climates. Peach and nectarine trees are often short-lived because of wood-boring insects, so plan to plant new trees every 10 years.

Redhaven: Easy-to-grow, blue-ribbon peach! Heavy-bearing tree yields bushels of large, almost fuzzless fruit. These luscious, award-winning peaches have a firm, creamy-yellow flesh. Good for fresh eating, canning or freezing. Freestone. Resistant to leaf spot. Ripens in July. Self-pollinating. Zones 5-8.

Blushing Star: This "star" is one of our heaviest-bearing peaches. Firm flesh has a unique, sweet flavor and stores well. Cold-hardy. Freestone. Resistant to peach leaf curl. Ripens in August. Self-pollinating. Zones 4-8.

Sentry: Start the season off right! Early-bearing variety has firm, sweet yellow flesh. Semi-freestone. Resistant to bacterial spot. Ripens in July. Self-pollinating. Zones 5-8.

PLUMS
Prunus species and hybrids

Plums tend to produce fruit erratically because the trees often lose their crop to late freezes or disease. In good years, plum trees will yield heavy crops of juicy fruits, that vary in color from light green to dark purple. Best adapted to Zones 4 to 8, plum trees need at least one compatible variety nearby to ensure good pollination. Select native species, such as beach plums in the Northeast may make the best homestead plums.

PEARS
Pyrus species and hybrids

Pears are slightly less cold-hardy than apples but are easier to grow organically in a wide range of climates. In Zones 4 to 7, choose pear varieties that have good resistance to fire blight, such as 'Honeysweet' or 'Moonglow.' In Zones 5 to 8, Asian pear trees often produce beautiful, crisp-fleshed fruits if given routine care. Most table-quality pears should be harvested before they are fully ripe.

How Do I Plant My Tree?

The best time to plant fruit trees in our zone is early spring, after the soil has thawed. Fruit trees that are set out just as they emerge from winter dormancy will rapidly grow new roots.

Choose a sunny site with fertile, well-drained soil that's not in a low frost pocket. Plant where your fruit trees will receive at least six hours of sun a day during the growing season. Sun should not be blocked by buildings, fences or other obstacles.

Protect your trees: a young tree's bark is particularly sensitive and enticing to deer, rodents, rabbits, raccoons and other wildlife. Consider planting in an enclosed area.

Plant at least three feet from sidewalks and driveways and six feet away from buildings, as roots will spread wider than the tree crown. Allow ten to fifteen feet of space between fruit trees.

Dig a planting hole that's twice the size of the root ball of the tree. Carefully spread the roots in the hole, and backfill with soil. Set trees at the same depth at which they grew at the nursery, taking care not to bury any graft union (swollen area) that's on the main trunk.

Water well, and install a trunk guard made of hardware cloth or spiral plastic over the lowest section of the trunk to protect it from insects, rodents, sunscald and physical injuries. Stake the tree loosely to hold it steady. Mulch over the root zone of the planted trees with wood chips, sawdust or another slow-rotting mulch. Keep mulch away from trunk by 3 to 4 inches. Water particularly well during any dry spells for the first two years.

One year after planting, fertilize fruit trees in spring by raking back the mulch and scratching a balanced organic fertilizer into the soil surface (follow application rates on the product's label). Fruit trees are highly sensitive to mineral deficiencies in their "diet." More frequent soil tests are required to make sure mineral levels are up to par and that the tree is getting what it needs to produce a good crop. Apple trees are especially finicky about calcium levels and generally require a supplement. Then add a wood-based mulch to bring the mulch depth up to 4 inches in a 4-foot circle around the tree. After two years, stop using trunk guards and instead switch to coating the trunks with white latex paint to defend against winter injuries. Add sand to the paint to deter rabbits and voles.

Pruning Fruit Trees

Pruning is a key aspect of growing fruit trees. The goal of pruning fruit trees is to provide the leaves and fruit access to light and fresh air. The ideal branching pattern varies with species, and some apple and pear trees can be pruned and trained into fence- or wall-hugging espaliers to save space. Begin pruning fruit trees to shape them in their first year, and then prune annually in late winter, before the buds swell.

Many fruit trees set too much fruit, and the excess should be thinned. When any

type of fruit tree is holding a heavy crop, thinning some of the green fruits will increase fruit size, reduce limb breakage and help prevent alternative bearing (a tree setting a crop only every other year).

To reduce the spread of plant diseases, garden tools should be kept clean and frequently sanitized. After each use, soil, sap and other debris should be cleaned off garden tools. Rinsing or washing pruners regularly will not prevent the spread of many different plant diseases. For this reason, we recommend regularly sterilizing your tools with a diluted solution of bleach or alcohol.

Pest and Diseases

Some types of fruit crops attract a large number of insect pests and can succumb to several widespread diseases for which no resistant varieties are available. For example, all of the stone fruits are frequently affected by brown rot, a fungal disease that overwinters in mummified fruit. Apply early-season sulfur sprays to suppress brown rot and other common diseases. Some apples have good genetic resistance to scab and rust, but you will still need to manage insect pests, such as codling moths.

Examples of specific pests are:

Apple: Apple Maggot, European Apple Sawfly, Round-headed Apple Tree Borer, Apple Mealybug, Apple Mealybug, Apple Coddling Moth (apple maggot), Black-Vine Weevil

Pears: Pear midge, coddling moth, pear psylla

Plums: Plum Curculio, Japanese Beetles Plum Aphids, Rust mites

Peaches: Plum Curculio, Oriental fruit moth, peachtree borer, shothole borer, cat-facing insects, scale, Japanese beetle and the green June beetle.

Bacterial canker is another disease that can be found in virtually every fruit tree. The particular disease symptoms in fruit trees include holes in the leaves, as well as new shoots, and even whole branches dying off. It is mostly found in stone fruit trees and trees that have suffered frost damage. Cut off the affected branches several inches below the disease and apply a fungicide.

Brown rot is an especially common fruit tree disease. Some of the many trees it can affect include: Peaches, Nectarines, Plums, Cherries, Apples, Pears, Apricots, Quince. With brown rot, the stems, flowers and fruit are all covered in a brown fungus that eventually mummifies the fruit. Remove the affected parts of the tree and fruit, and prune to allow for more sunlight and air circulation among the branches.

Monitoring

Keep records on growth, blossoming and fruiting habits of your fruit trees year to year. This gives you an indicator on what the normal growth of your tree looks like. Reduced growth and a decline in general health may indicate crown rot or a root fungus.

Check the tree's leaves. Look for discoloration, spots or curling on the edges. Peach, nectarine, plum and apricot trees often suffer from peach leaf curl. The primary causes of peach leaf curl include damp weather and fungus. Shriveled or damaged leaves may indicate brown rot or apple scab, particularly in pear and apple trees. Cedar-apple rust causes yellow or brown spots on the leaves.

Inspect the bark on the tree. Spots of discoloration or peeling bark signal a possible bacterial canker. Other symptoms include leaf dieback in the spring, and eventually the canker site leaks a dark, gum-like material.

Look for blackened leaves and stems. These symptoms could mean your tree has fire blight. The infected areas will die. Quick removal of branches with fire blight ensures the tree's survival.

Examine the fruits on the trees regularly. Symptoms such as rotting and discolored spots on the fruits suggest one of the numerous types of rot diseases fruit trees develop. Black rot, crown rot, bitter rot and white rot all damage the fruits on an infected tree.

Tips to Control Diseases and Pests

Many organic growers keep their fruit trees coated with the highly refined kaolin clay during the growing season to repel pests. Kaolin clay repels pests by making the fruit tree an unsuitable environment for certain insects to land, feed and lay eggs. The tiny clay particles serve to disguise the target fruit and can clog the eyes, ears and reproductive organs of many common pest insects including apple maggot, plum curculio, codling moth, European apple sawfly, oriental fruit moth, tufted apple bud moth, white apple leafhopper, and pear psylla. It is important to build up a proper covering of clay on your trees or it will not be effective. Spraying at least 3 times, each application a week apart, after initial petal fall is recommended. A sprayed tree will be coated by a thin white film of clay particles. Be careful not to overspray, as too much clay can negatively affect mite predator insects and possibly trigger a red mite infestation. Repeat applications after any major rain event are also recommended to provide ongoing protection from pests. Kaolin may harm some beneficial insects so spray in the evening when they are less likely to be around.

Apply a dormant-oil spray for fruit trees, per the manufacturer's instructions, in early spring while the tree is still dormant, and as soon as green shoots appear on the apple tree. A dormant-oil spray will suffocate any insect eggs, like mites and aphids, that may have survived over the winter. Spray early enough so that the buds on the trees haven't yet begun to swell. Wait until the daily temperature is at least 40 degrees F. and will stay that way for at least 24 hours. Fill your sprayer with the oil solution and slowly cover the tree, beginning with the topmost branches. Move all around the tree to get the spray into all the crevices.

Neem oil can also be used but it possesses additional bactericidal and fungicidal properties. Neem is a botanical insecticide derived from the neem tree. It is a broad-spectrum insect poison, repellent, and feeding deterrent. It also stops or disrupts insect growth and sterilizes some species. Spray when the leaves will remain wet for as long as possible. Neem oil can be harmful to bees upon direct contact. Should be applied at night or when blossoms are not present.

Some growers utilize chickens or other fowl to forage beneath fruit trees to help suppress insects.

Remove infected areas of the tree and destroy them as soon as possible to prevent the spread of disease.

Pruning, fertilizing and watering your trees in the correct way and at the right time for each species decrease the risk of disease.

Use biological controls to remove some types of insects from your fruit trees. Lady beetles, also called Lady bugs, devour small insects, as well as their eggs, without harming your plants.

Place pheromone traps in your trees to capture many varieties of flying pests and moths, such as tarnished plant bugs, peach tree borers and common fruit flies. Hang these traps as soon as you notice flying bugs eating the leaves and blossoms of your fruit trees. Place a single trap in small trees and two traps in larger trees. The scent emitted by these traps lures bugs inside and traps them there. Change the trap's caps every four weeks to continue catching these bugs. These traps may also capture some beneficial insects in the process so carefully monitor them.

Welcome the birds! They are the best of all insect destroyers, along with frogs in a pond that should be close-by, or having your orchard enclosed and welcoming chickens or ducks. Put up plenty of bird houses for backyard birds such as bluebirds, sparrows and wrens.

Contact your county extension service to report disease problems and for treatment advice. They will also help answer any questions on any regulations on using chemical controls for tree diseases.

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hgic.clemson.edu/factsheet/peach-insect-pests/

www.starkbros.com/

portal.ct.gov/CAES/Fruit-Growing/Fruit-Growing/Fruit-Growing-Information

extension.umaine.edu/fruit/growing-fruit-trees-in-maine/insect-pests/

www.connecticutmag.com/the-connecticut-story/how-to-grow-your-own-mini-orchard/article_35e13e6c-b6de-11e8-8b76-f3309cbcb794.html

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homeguides.sfgate.com/organic-pest-control-apples-30404.html

Rodale's All-New Encyclopedia of Organic Gardening
Rodale Press, ©1992

The Gardener's A-Z Guide to Growing
Tanya L.K. Denckla, Storey Publishing, ©2003

Fruit Growing Information

Important Links from Connecticut State:
Connecticut Agricultural Experimentation Center

Apple Information Manager (AIM) *orchard.uvm.edu/aim/*
This site developed by researchers and extension agents at the Universities of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont has links to websites that should benefit New England commercial apple growers. It has links for an archival library, decision support, newsletters, and weather, and for contacting extension agents.

2020 New England Apple Pest Management Guide & Updates
www.umass.edu/fruitadvisor/NEAPMG/index.htm

2020 Pest Management Guidelines for Commercial Tree Fruit Production
(Cornell University) *www.nysaes.cornell.edu/ent/treefruit*

Scaffolds Fruit Journal *www.nysaes.cornell.edu/ent/scafolds*
This newsletter published by Cornell University at Geneva (New York State Agricultural Experiment Station) and Ithaca provides a weekly update on pest management and crop development. This site has links to other fruit-related sites such as Apple IPM: A Guide for Sampling and Managing Major Apple Pests in New York State, Cornell Tree Fruit Pest Management Recommendations, Fruit Notes, IPM Tree Fruit Insect Fact Sheets, and Sustainable Apple Production.

The UMass Fruit Advisor *www.umass.edu/fruitadvisor*
This site developed by the University of Massachusetts Extension has information on apples, peaches, pears, plum and cherries. It has links to Healthy Fruit, Fruit Notes, Fact Sheets, IPM, March Message, and other sites with fruit-growing information.

University of Connecticut *www.ipm.uconn.edu*
University of Connecticut fruit pest messages.

New England Agricultural Statistics Service *www.nass.usda.gov/nh/*
This website provides a wide variety of New England agricultural statistics. Statistics from the rest of the nation may be obtained at *www.nass.usda.gov*

The Connecticut Agricultural Experiment Station Plant Pest Handbook
A guide to insects, diseases, and other disorders affecting plants. On-line and updated version of the *Plant Pest Handbook*. The Station published its first report on effective and practical means of controlling plant diseases in 1889. In the many decades that followed, Station scientists published hundreds of scientific reports on the biology and ecology and on the chemical, natural, and integrated pest management (IPM) of diseases, insects, mites, and nematodes of Connecticut crops and plants. This great wealth of information was initially summarized in the Station's first *Plant Pest Handbook* published in two volumes in 1933 and 1934. The *Plant Pest Handbook* was last published in 1956 but an up-to-date, searchable version is on the website: *https://portal.ct.gov/CAES/Plant-Pest-Handbook*

Growing an Organic Vegetable Garden

Joan Cominski

Vegetables grown organically will taste better, be healthier, save you money and be better for the environment and provide you with satisfaction and enjoyment.

photo by Marcia Chaloux

An organic vegetable garden is a natural and healthy way to grow vegetables for you and your family. Deciding to go organic will result in vegetables that have not been treated with chemicals or herbicides. Vegetables grown organically will taste better, be healthier, save you money and be better for the environment and provide you with satisfaction and enjoyment.

Feed the Soil

The soil is the basis for everything that grows in our gardens. If the soil is nutrient-weak, compacted, or devoid of beneficial microorganisms, it will not support healthy plants. You can try to "fix" it with fertilizers, but a plant won't grow as well as one grown in healthy, rich, crumbly soil. By feeding the soil, you provide plants with a good foundation for healthy growth. Plants that are healthy are less likely to be bothered by pests and disease problems.

Add organic soil amendments, such as compost, manure, chopped leaves, and mulches in and onto the surface of the soil. You can create your own compost pile by designating an area or bin where organic matter will decompose, or you can buy it in bulk if you have a large garden, or use bagged compost available at garden centers and home improvement stores.

Well-fed soil also hosts communities of beneficial insects like earthworms, arthropods, and more. They decompose organic matter through their digestive processes. These insects also support bird communities by being a protein source for predatory birds. Those birds also eat your pests feeding off your plants.

A soil test will inform you of any mineral deficiencies, and explain how to remedy the situation. You can find out more about soil testing by visiting the UCONN Home & Garden Education Center, http://www.ladybug.uconn.edu/FactSheets/soil-testing.php, or by contacting your local Cooperative Extension office.

Plants and Seeds

You'll want to start your vegetable garden with organically-grown plants and seeds. Conventionally grown plants are often already loaded with pesticides and chemical fertilizers, exactly the types of things you're trying to avoid in your vegetable garden. Organically produced seeds are harvested from organically grown plants and have never been treated with chemical pesticides or fungicides, and never genetically modified.

There are several good mail order companies that provide organic vegetable garden seeds such as Eden Brothers, Annie's Heirloom Seeds, Baker Creek Heirloom and Johnny's. More nurseries, garden centers, and big box stores are also starting to sell a selection of organic seeds, these are clearly labeled as "organic."

Plant and Grow

Look up information on the types of vegetables you want to grow to ensure that you're providing them with the right amount of light, water and soil preferences. Match the plant to the right site and it will grow more robustly and be better able to resist pest and disease issues.

Consider doing some companion planting for a healthier garden. Purchase and plant disease-resistant varieties. Plant in an area that gets full sun, at least 6 hours a day (8 to 10 hours is even better).

Plan your garden well by staking plants to keep them off the ground and dry and by interplanting vegetables to slow the possible spread of problems. Two good sources for companion planting are *Carrots Love Tomatoes* by Louise Riotte and *Rodale's Ultimate Encyclopedia of Organic Gardening*.

Give your plants some breathing room: Fungal diseases run rampant when plants are planted too closely.

Make use of trap crops and row covers, to exclude and divert garden pests. Pest insects often prefer one type of a plant over others. You can lure the pest insect to the trap crop and eliminate the need to have to treat your desired crop. Please remember to only use your row covers for shorter time periods because if used too long they can block pollination altogether. Most plants depend upon pollination to grow. If you're covering a plant which requires external pollination, they won't grow. Therefore, you should either pollinate by hand or remove the row cover.

All gardens require frequent watering, so make sure you have a spigot and hose that will reach all corners of your plot. Once the garden is planted, water regularly so plants aren't stressed by drought. Do not water the plant from the top and avoid getting the leaves wet which may promote the growth of mildews like powdery or downy mildew. Consider installing a soaker hose, scheduled to run in the early morning, that will deliver


photo by
Marcia Chaloux

water directly to the roots and prevents splashing.

Mulch to prevent splashing soil and pathogens onto plants, and remove and dispose of diseased or infested plants. Dispose of diseased leaves in the trash not in your compost pile.

Because many closely related plants are affected by the same diseases, avoid planting them where their relatives grew the year or two before. Two of the biggest families to watch out for are the tomato family (tomatoes, peppers, potatoes, eggplant) and the squash family (squash, pumpkin, cucumber, watermelon). Rotating crops to different parts of the garden helps limit disease development and depleting the soil of nutrients.

Sanitation is critical. Regularly clean your hand tools and shovels. Weed-competition will affect your yield and often invite unwanted garden pests. Deadhead to encourage new growth and remove dead/infected plants to stop the potential spread of disease. Cleanup and dispose of debris.

Pest Management

Even with the best intentions, planning and care over your garden pests are likely to be frequent visitors. When a problem does occur, it is essential to correctly identify the cause. An organic garden may not result in the most perfect looking vegetable. This is a minor trade off for a tastier and healthier crop.

IPM, or Integrated Pest Management is your best defense. Learn to identify the insect, is it friend or foe? The use of pesticides should be the last resort. Just because an insecticide has a botanical origin or is considered acceptable to organic gardeners, it may still contain a toxin and is not automatically safe for humans. Consider choosing to not use an insecticide. Observation and manual removal may be enough. Your vegetables will be free of any pesticides and safe for you and your family and non-toxic to birds, insects and the environment.

Beneficial Insects

Controlling pests biologically involves partnering with friendly fauna (insects, arachnids, reptiles, and birds) to keep your unfriendly fauna (pest) population under control. Identifying your friends in the garden is the first step to gardening without poisons. Encourage beneficial insects. A shallow pan or birdbath with pebbles (so insects don't get caught and drown) will attract beneficial insects, including bees. As water evaporates, it concentrates dissolved minerals, which are much needed by insects.

Please refer to the "Heroes in the Garden–Beneficial Insects" section (starting on page 11) for several you are likely to find in your garden.

Common Pests in the Garden

By familiarizing yourself with these common pests, and learning what vegetable plants they are most likely to target, you will be able help control them and keep them away from your vegetables. *The Gardener's A-Z Guide to Growing*, Tanya L.K. Denckla, is an excellent resource identifying most fruits and vegetables and organic options to treatment.

The earliest pests affecting vegetable plants are the larvae or worms that are the second stage in an insect's life. Many of these pests look like colorful caterpillars, but they are anything but friendly. These pests can munch through an entire row of plants in a matter of days.

PEST	PHOTO	HOST	DAMAGE	CONTROL
APHIDS Tiny, pear shaped; long antennae; two tubes projecting rearward from abdomen. Aphids are tiny (adults are under ¼-inch), and often nearly invisible to the naked eye.		While aphids in general feed on a wide variety of plants, different species of aphids can be specific to certain plants. For example, some species include bean aphids, cabbage aphids, potato aphids, green peach aphids, melon aphids, and woolly apple aphids.	They suck sap from the leaves and stems causing leaf cupping/curling and stunted plant growth. Aphids leave a sticky substance called honeydew on plants, which can allow black fungus to grow. They can also transmit diseases such as mosaic and sooty mold.	Wash plants with strong spray of water; conserve native predators and parasites: aphid midges, lacewings or lady beetles; spray with garlic spray, insecticidal soap, dormant or summer oils, alcohol. Fall cultivation.
CABBAGE LOOPER Cabbage loopers lack walking appendages in the middle of the body and move by drawing the rear end up to the front end and then straightening. A cabbage looper has a smooth light green body with a white stripe along each side and reaches a length of 1¼ inch.		This pest attacks cabbage but it can be found on other greens such as broccoli, kale, turnip, mustard, cauliflower, and Brussels sprout.	It affects crops in the larval form (caterpillar or grub) and also in the adult form (butterfly). It feeds on the leaves, causing ragged holes and other damages that lead to the loss of the crop.	The easiest, most accessible and safest way to get rid of cabbage looper pests is by manual removal. The caterpillars are big enough that you can easily spot them. Look in the morning and late evening when temperatures are cool.
COLORADO POTATO BUG Adults (⅓" long) are rounded, yellowish-orange beetles with 10 black stripes on their wings and black spots just behind the head. The plump larvae, (⅛ to ½" long) are red with black head and legs, and become yellowish-red or orange with two rows of black spots on each side of the body.		Potatoes, tomatoes, eggplant.	Both the adult and larval forms chew leaves and can completely defoliate an entire crop if natural control methods are not implemented. Their feeding can greatly reduce yield and in some cases, may even kill plants. Alternate host plants include tomatoes, peppers and eggplant.	Apply floating row covers; apply parasitic nematodes to soil.

PEST	PHOTO	HOST	DAMAGE	CONTROL
FLEA BEETLE Adults are small, (1/10" long), shiny, dark brown or black beetles with large hind legs that allow them to jump when disturbed. Some species may have white or yellow stripes on their wing cases. Larvae are small, cream-colored worms (1/8–1/3" long). They live underground and feed on the roots and tubers of young plants as well as on germinating seeds.		They feed most on hot sunny days and attack a wide variety of plants including beans, cabbage, corn, eggplant, potatoes, peppers, tomatoes, lettuce and most seedlings.	They will damage plants by chewing numerous small holes in the leaves, which make them look as if they have been peppered by fine buckshot. When populations are high, flea beetles can quickly defoliate and kill entire plants.	Apply floating row covers; apply parasitic nematodes to soil.
MEXICAN BEAN BEETLE Adult beetles, (1/4" long) are similar in appearance to large ladybugs. They are yellow to coppery-brown in color, oval in shape, and have 16 black spots on their wing covers. Larvae (1/3" long) are fat, hump-backed grubs with fuzz or spines, arranged in six longitudinal rows on their backs. They are orange to yellow in color and attach themselves to leaf surfaces.		This species is known for going after bean plants specifically, and mainly those in the legume family. Cowpeas, lima beans, snap beans, soybeans.	Besides scabby, pock-marked beans, Mexican bean beetles will also rapidly defoliate your bean plant's leaves. They start young and devour the leaf even as larvae. Check the underside of your plants and destroy any larvae and beetles found.	Bush beans are less susceptible than pole beans, and also require less maintenance. Early crops are also less susceptible than late crops, as the most Mexican bean beetle damage occurs in midsummer. Rosemary or marigolds may also work.
SNAILS & SLUGS Snails have a shell on their dorsal side while slugs lack it. Slugs and snails thrive in damp, shady spots and can often be found along foundations, under rocks or in well mulched garden areas. Slugs are not true insects, but rather members of the mollusk phylum. Both garden pests rely on their muscular foot to move and the secretion of mucous or slime on which they glide. Their travel is marked by the shiny slime trail they leave.		Artichoke, asparagus, basil, bean, brassicas, celeriac, cucumber, eggplant, greens, lettuce, onion, pea, pepper (seedlings), squash.	These are soft-bodied creatures that feed on the foliage and stems. They can really cause great damage to the seedlings and tender crops.	Reduce habitat by removing garden debris. clippings and weeds. Water in the morning, place stale beer in shallow pan, sprinkle diatomaceous earth around base of plant.
STRIPED OR SPOTTED CUCUMBER BEETLE Adult cucumber beetles, (1/4" long) are yellowish-green in color with dark heads, legs and antennae. They have distinct black spots or lengthwise stripes on their wings. The larvae are white grubs with brownish heads.	 	**Spotted:** Cucurbits (i.e. cucumber, squash, pumpkin, muskmelon) legumes, tomato, ornamentals, and fruits, plus many other weeds and cultivated plants. **Striped:** Primarily cucumbers and other cucurbits, but many other crops such as apple, pear, green beans, okra, eggplant, and potato, plus tree and shrub blossoms.	They will eat the pollen, flowers, leaves and can infect the plants with a bacterial wilt. Both beetles are serious carriers of plant diseases, including Fusarium wilt, mosaic viruses, muskmelon necrotic spot virus, and cucurbit bacterial wilt, although spotted beetles are considered less important vectors of this devastating disease than striped beetles.	Plants can be protected when they are small by mechanical means. Use floating row covers over susceptible plants until they bloom. Remove the row cover once plants bloom to allow insects in to pollinate the flowers. Plant susceptible crops around June 15, after overwintering adults have emerged and dispersed elsewhere.
SQUASH VINE BORER The adult resembles a wasp. It is about 1/2" long with an orange abdomen with black dots and the first pair of wings is metallic green while the back pair of wings is clear. Eggs are flat, brown, and about 1/2" long and the larvae are white or cream-colored with brown heads, growing to almost an inch in length.	 	It is a serious pest of vine crops, commonly attacking summer squash, winter squash and pumpkins. Cucumbers and melons are less frequently affected.	Active mid-June through July, they emerge as cocoons in the ground. In home gardens, entire crops may be lost in a year of high borer populations. Feeding by larvae causes yellowing of leaves and wilting. Once the larvae invade the stem, it is difficult to treat squash vine borers.	Plant a second planting of summer squash in early July. These plants will mature after adult borers have finished laying eggs and will not suffer any damage. Promptly pull and destroy any plants killed by squash vine borers.

PEST	PHOTO	HOST	DAMAGE	CONTROL
SQUASH BUG (STINK BUG) Adult squash bugs are flattened, large insects. They measure ⅝" long and ⅓" wide. They are usually dark gray to dark brown. Their abdomens have alternating orangish and brown stripes. Back is shaped like a shield. The eggs are oval shaped, 1/16" long, and yellowish to bronze. Squash bugs give off an unpleasant odor in large numbers or when crushed.	  	The squash bug is a potential problem on all vegetable crops in the cucurbit family. They are often found in large numbers and tend to congregate in clusters on leaves, vines and fruits. Injury to the plant is caused by both nymphs and adults sucking sap from the foliage and vines.	As they feed, they inject a toxic substance that causes host plants to wilt. When feeding is severe the leaves become black and crisp and die back. This condition is often referred to as "anasa wilt" which closely resembles bacterial wilt, a true plant disease. Smaller plants may be killed, while larger plants often recover once feeding stops. Heavy infestations may prevent fruit from forming.	Keep the garden well weeded. Insecticidal soap sprayed must be laced with isopropyl alcohol to help penetrate the bug's outer shell. Hand pick and destroy. Trap squash bugs by laying out boards or pieces of newspaper. Squash bugs will group under the boards at night, you can then collect and destroy them in the morning.
TOMATO HORNWORM Likely to be the largest caterpillars you'll see in the vegetable garden, tomato hornworms (3-4" long), are green with seven diagonal white strips and a black or red horn projecting from the rear. Adults are large (4-5" wingspan), heavy-bodied moths. Despite their large size, hornworms are often difficult to spot because of their protective coloring. The moth is gray or brown in color with white zigzags on the rear wings and orange or brownish spots on the body. Also called a sphinx or hawk moth, they fly quickly and are able to hover like a hummingbird.	 	The tomato hornworm is one of the most destructive pests of tomato, potato, pepper, eggplant and tobacco plants.	They consume entire leaves, small stems, and sometimes chew pieces from fruit. You may see dark droppings on leaves (frass).	Rotate your crop. Don't plant tomatoes where you had them last year. Till soil at the beginning and end of each gardening season to destroy over-wintering larvae. Tillage has shown to cause up to 90% mortality. Handpick larvae and eggs. Look for green droppings under plant. Do not pick eggs with dark streaks which are the parasitic wasp. Apply hot pepper or soap and lime sprays directly on worms. Encourage birds. Borage and dill as trap crops, opal basil and marigold.

COMMON VEGETABLE DISEASES

A wonderful source that describes the potential disease that can affect a specific vegetable is on Cornell University's, plant pathology web site: *"Disease Fact Sheets Listed by Crop"* http://www.vegetablemdonline.ppath.cornell.edu/cropindex.htm.
(The pictures & information below are from Urban Farmer.)

Identifying and Treating Diseases

Blight Disease

(a.k.a. Phytophthora Blight, Crown Rot, Fruit Rot)

Symptoms: Attacks and leaves brown spots on roots, stems, leaves and fruit. Wilting and death occur right when reaching the fruiting stage. Fruit rotting.

Cause: Occurs naturally in soil with high moisture, poorly drained soils.

Control: Once spotted remove all plants from soil and burn. Practice crop rotation. Avoid poorly drained soils. Fungicides can be used as a prevention.

Downey Mildew Disease

Symptoms: Blush tinge on upper part of leaves, maturing to small yellow spots on upper side with white fluffy growth underneath.

Cause: Occurs in cool temperatures and high humidity.

Control: Plant debris should be removed and burned. Space plants for good air circulation. Fast draining soil. Fungicides should be used under wet conditions for prevention.

Common Vegetable Diseases continued

Leaf Spot Disease

Symptoms: Attacks leaves of plants. Black tar looking ripples in the middle of brown spots on leaves. A fungus disease.

Cause: Most damages occurs in spring. Wet weather invites fungus spores to reproduce.

Control: Does not harm actual tree. Remove infected leaves. Keep foliage dry if possible. Use organic copper fungicide if needed.

Root Spot Disease

Symptoms: Attacks plant roots. Plants will be stunted and stop growing. Foliage will be dull. Sometimes leaves turn yellow and wilt. Plant may have to be lifted from ground to discover root rot.

Cause: Damp or dry soil can cause this. Certain funguses will cause as well.

Control: Increase soil drainage. Avoid dense, clay soil. Fungicides have been shown to help but increase soil drainage is best option.

Powdery Mildew Disease

Symptoms: Starts off with small white powdery looking dots on leaves and will continually worsen as time goes on. Will attach beans, beets, carrots, cucumbers, eggplant, lettuce, peas, peppers, pumpkins, tomatoes and more.

Cause: Damp, hot weather can cause powdery mildew but is not dependent on these factors.

Control: Planting varieties that are better resistant to powdery mildew is important when growing in areas that have had it in the past. Plant in full sun. May require fungicide treatment.

Verticillum Wilt Disease

Symptoms: Leaves turn yellow and dry up. Starts from bottom and moves up.

Cause: Caused by soil borne fungus and can affect several different vegetables. Fungus can persist for years. Affects uptake of water and nutrients eventually killing the plant.

Control: Crop rotation and resistant varieties is important. Remove affected plants and burn.

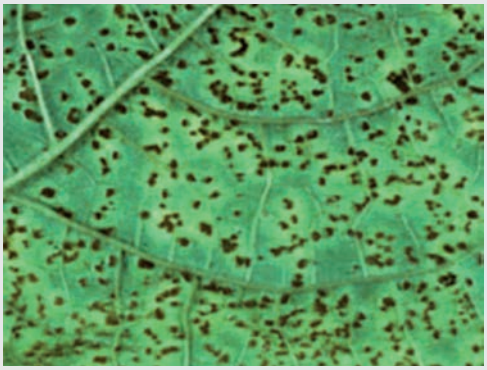
Blossom End Rot

Symptoms: This is a very common occurrence on tomatoes and peppers. Fruits start to rot from bottom up. Looks like a brown, ripply skin.

Cause: A couple things cause this. Dry weather following wet spell. Insufficient calcium in soil.

Control: Mulch around tomatoes to even moisture. Add lime to the soil.

Rust Disease



Symptoms: Pustules on leaves occasionally on the other aerial parts. Pustules may be orange, yellow, brown, black or white.

Cause: Caused by fungus disease.

Control: Pick off infected plant parts and burn. Use organic copper based fungicides.

Assess the Damage

How much damage am I willing to tolerate? Don't overreact. One hornworm or some chew marks should not send you to the shed for the sprayer. Ask yourself:

- Is the insect making the leaves ugly, but not harming the vegetable?
- Will the problem be gone before any real damage is done?
- Try to see how many insects there are and if they are spreading. Be sure to identify the insect so you know what you're dealing with.
- Is this an isolated problem that will clear up when the weather changes or the insect moves on?
- Am I willing to sacrifice some dill to have swallowtail butterflies?

Use the Simplest Solution First

Maintain a clean garden: Remove diseased foliage from the area. Pick up fallen vegetables. Be ready to prune; powdery mildew and blackspot can be thwarted by opening up the plant and cutting back diseased or weak stems.

Observe, observe, observe: If you catch a problem at the beginning, such as a case of blackspot or an aphid infestation, you can nip it in the bud right away. It is much easier to deal with it in its early stages than having to fight off a full infestation. Check your garden regularly to watch for problems. Look at the underside of a leaf.

Hand removal is easiest if started early. Wearing yellow gloves with a bit of petroleum on them helps gather the insects easier. Remove the infected or infested plant before it has time to spread. You can monitor for pest egg masses on the undersides of

leaves and squash or remove the eggs before they become a problem. Many beetles are slow-moving, especially while mating, and you can knock them off plants into a jar of soapy water. Borers can often be cut out of the affected plant part without killing the plant.

Create physical barriers such as floating row covers which will let light and water in and can also protect against frost or sun. Wire cages exclude rodents and other four-footed pests. Plastic cups around a young plant can protect it from cutworms.

Rotate your crops to prevent the problem from over-wintering. Remove all plant debris in the fall, so there is no shelter for over-wintering garden pests and spores.

Last Resort

Below are the common insecticides that are used in organic vegetable garden. Note that many others are available and sometimes recommended. Considerations should be made that most of these insecticides are toxic or harmful to honey bees. They are best applied at the end of the day and when the bees are not present. No matter how safe an insecticide is reputed to be, the introduction of botanical poisons, mineral and other substances alter a garden's natural system of checks and balances. When choosing to use an insecticide use according to instructions and do your best to apply only the affected plant.

INSECTICIDE NAME	USE AGAINST	HOW IT WORKS/ HOW LONG IT LASTS	HOW TO USE IT
Bt. Bacillus thuringiensis Toxic primarily to caterpillars	Cabbageworms and cutworms. Use *B.t. tenebrionis* for Colorado potato beetle.	Bacterial toxin; causes caterpillar death usually within 24 hours. Dissipates in 2 days or less.	Available as spray or dust. Apply late afternoon and reapply after rain. Mix with insecticidal soap for better coverage. Most subspecies (kurstaki, israelensis, and tenebrionis) have little or no toxicity to bees but ssp. Aizawai was found to be highly toxic to honey bees.
Diatomaceous Earth (DE) Toxic primarily to soft-bodied insects, snails and slugs	Discourages aphids, juvenile Colorado potato and bean beetles, leafhoppers, and thrips.	Sharp-edged diatom skeletons scratch insect exteriors, causing them to dry out.	Use natural grade DE, not the kind used in swimming pool filters. Wear dust mask.
Particle film dust Coats leaves and repels insects	Japanese beetles, tarnished plant bugs, and Colorado potato beetles.	Specially refined kaolin clay uses microscopic particulates to form barrier film on leaves.	Low toxicity to bees but may affect some beneficial insects. Kaolin application can disrupt bee foraging. Apply at night to minimize exposure.
Horticultural oils Non-selective and may cause harm to some beneficial insects	Kills aphids, corn earworms, leafhoppers, spider mites, whiteflies	Kills pests by suffocating them.	Use superior horticultural oil versus dormant oil to prevent leaf pores being clogged. Do not apply to drought-stressed plants, or on hot, cold, or very humid days. Harmful to bees upon direct contact. Apply at night to minimize risk to bees. Non-selective and may cause harm to some beneficial insects.
Insecticidal soap Toxic mostly to soft-bodied insects	Kills aphids, earwigs, grasshoppers, Japanese beetle adults, leafhoppers, spider mites, whiteflies.	One of the safest insecticides. Fatty acids destroy the cellular membrane of insects on contact. Biodegrades in 2 to 14 days.	Mix with warm soft water and be sure to cover both sides of leaves. Can burn leaves during hot weather. Apply at night to minimize risk to bees.

Resources:

garden.org/learn/articles/view/255/

hortnews.extension.iastate.edu/squash-vine-borer

extension.umn.edu/yard-and-garden-insects/squash-vine-borers

www.ufseeds.com/learning/disease-control/

extension.umn.edu/yard-and-garden-insects/squash-bugs

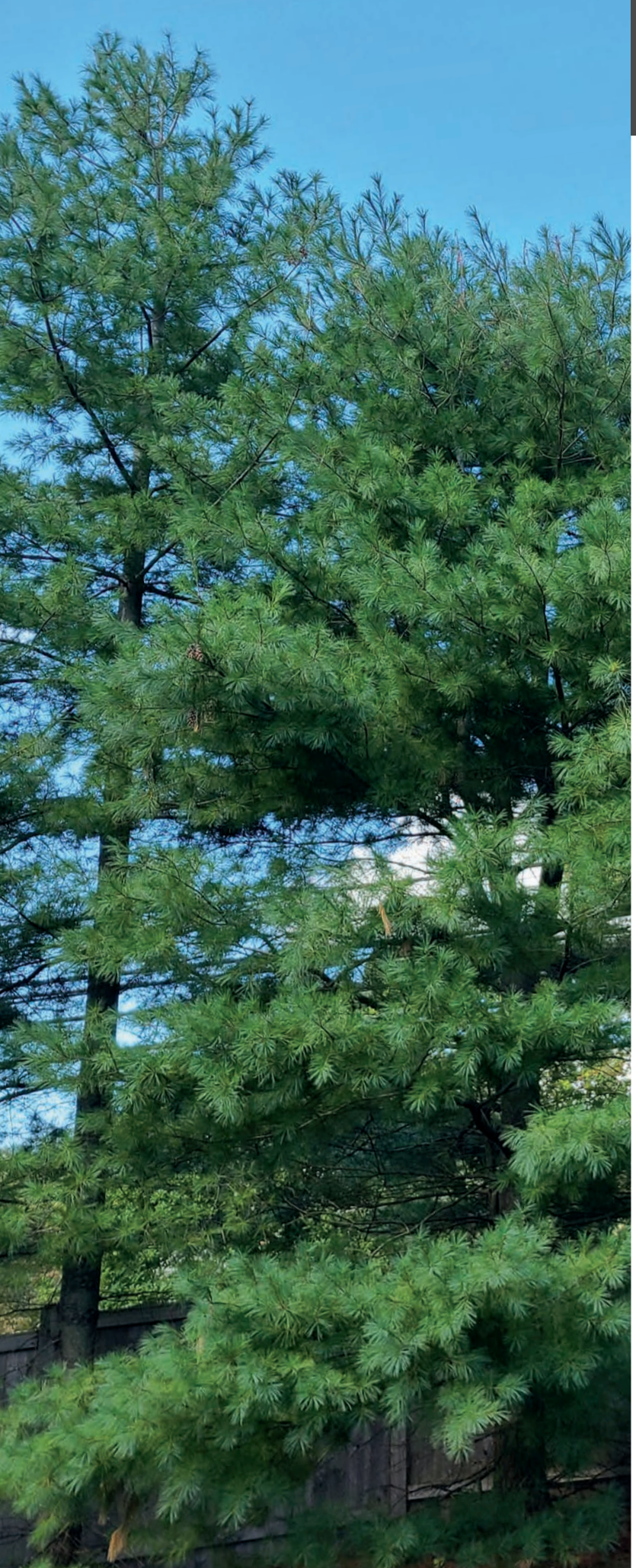
www.gardeningknowhow.com/edible/vegetables/vgen/vegetable-garden-pests.htm

www.planetnatural.com/pest-problem-solver/garden-pests/colorado-potato-beetle-control/

extension.umd.edu/hgic/topics/cucumber-beetles-spotted-or-striped-vegetables

The Gardener's A-Z Guide to Growing, Tanya L.K. Denckla, ©2003, Von Hoffman

Rodale's All-New Encyclopedia of Organic Gardening, ©1992, St. Martin's Press



Conifers

Mary Wilson

Protection of our valued conifers is particularly important as mean temperatures rise, and new and harmful insects and diseases become more prevalent.

We may not think about our conifers as much as we do our showier shrubs and perennials, but how we would miss them if they disappeared from our yards! Whether they are planted as a screen, foundation plant, a shade tree, or a specimen tree, they are the year-round underpinnings of our yardscape.

Problems with evergreens often are not noticed early on, so it is wise to inspect your evergreens once a month or so to be on the look-out for any signs of damage or stress. In this era of global warming, most trees in Connecticut are stressed when temperatures go above 90 degrees. To avoid problems, keep trees properly pruned, mulched and watered during drought events. Also, avoid damage with lawn mowers, string trimmers or pruning tools. Wounds are a common place for cankers to develop.

With taller evergreens you may not want to tackle any spraying or other remedial activity. If you do call in a professional, please discuss treatment options and if possible insist on a non-toxic solution. Also, any sprays should be used as the label suggests, with timing and dosing done with the protection of beneficial insects, including bees, in mind. Spraying is best done late in the afternoon or early evening when any bees would have left the site.

Use the following carefully:

BTK: *Bacillus thuringiensis var. kurstaki*, one of the first bacterial pest controls on the market. After BTK is applied to plants, caterpillar pests may live several more days before dropping to the soil. Use judicially as desired caterpillars may be affected as well.

Insecticidal soaps: Use to control soft-bodied insects; less effective on chewing insects. Use cautiously since these soaps can kill beneficial insects.

Oil sprays: Horticultural oil sprays work to physically smother and kill pests and their eggs. Most newer oils can be used year-round on a variety of plants (may be listed as dormant or summer spray). Check label for use instructions. They come as oil and must be mixed with water to form an emulsion. Do not apply if temperatures are likely to exceed 85 degrees or night temperatures to fall below freezing.

Are these products appropriate for use if you are on the Pollinator Pathway? Although all the above products may pose some risk to beneficial insects and bees, they may be used IF used properly, following directions on the label, and only after all other less toxic methods have been tried.

PINES

(Pine trees of Connecticut: White pine (pictured), pitch pine and red pine)

Pines prefer a well-drained, somewhat acid soil enriched with organic matter. They prefer full sun, but will grow in partial shade, but with a somewhat more open habit. Although they are usually disease free, they are subject to some diseases and insect damage.

Needles brown at base, shoots ooze resin:

Cause: A fungal disease, commonly called tip blight. Entire shoot tips may be killed, most commonly on lower branches. Tip blight most commonly attacks old or stressed trees. Prune out dead branches during dry autumn weather. Also cleanup fallen cones.

Branches with brown tips:

Cause: Pine tip and pine shoot moths or spruce budworms. Handpicking works if only a few caterpillars are present. Pruning off and destroying infested tips in winter is a very effective control. Spraying with BTK before the caterpillars enter the shoots may be effective.

Terminal shoot curled and brown:

Cause: White pine weevils. Adult weevils emerge in late summer. Early in the season cut off damaged several inches below the affected area.

Bark damaged; needles yellowish.

Cause: Beetles; weevils; pine bark adelgids. Beetles and weevils make small holes in the trunk where they tunnel underneath the bark. Adelgids are small, cottony, white insects that congregate on the bark of the trunk and limbs. Best control is prevention–fertilize and water if injured and/or stressed. Control adelgids by spraying several times with a strong blast of water. For more serious infestations, spray the trunk and branches with insecticidal soap every 3 days until the pests are gone.

Needles light gray or bronze.

Cause: Spruce spider mites. Mites start feeding on lower needles and progress outward; tiny webs may be visible on needles. In spring spray with dormant oil before growth starts. During active growth, spray repeatedly with strong jets of water. For severe infestations, make 2 applications of insecticidal soap 7-10 days apart.

Needles discolored and drop.

Cause: Needlecasts. Several kinds of fungi cause spots, bands or total browning of needles. Planting trees where they will

have good air circulation is the best way to avoid problems. Cleaning up fallen needles and pruning damaged tips will help.

NOTE: For Eastern white pines (*pinus stribus* and *cvs*.), it is common for some needles to yellow and fall off after two growing seasons. This may be alarming but completely normal.

Trunk or branches with oozing lesions; branch tips die back.

Cause: Canker. Several kinds of fungi cause cankers. Remove and destroy affected branches. If possible, cut away and destroy the cankered area, along with 2″ of healthy bark. Heavily diseased plants cannot be cured and should be removed and destroyed.

Needles skeletonized or with large holes; branches may be webbed.

Cause: Caterpillars, several kinds including tent caterpillars and web worms. Manually destroy nests. Opening nests up for birds to eat caterpillars may work. Or at first sign of damage spray with BTK.

Plant defoliated.

Cause: Sawflies. Damage appears midsummer or early fall. Natural parasites usually keep them in check. If necessary, handpick the white, green or brown caterpillar-like larvae. For severe infestations, spray the plant with insecticidal soap.

Needles yellow: stems and needles covered with small bumps.

Cause: Scales. Various types and eating habits. If possible, scrape off minor infestations with fingernail. Prune out badly infested growth or use a soft brush and soapy water to gently scrub off scale. Apply a dormant oil spray to the trunk and branches before growth starts in spring or superior oil during the growing season.

Plant defoliated; branches bear cocoon-like bags.

Cause: Bagworm. Caterpillars create bags which may look different on different species of trees. Handpick and destroy the bags. As soon as you notice the caterpillars start a program of spraying with BTK applied every 10 days (or after a heavy rain) through midsummer.

Trunk or branches with small holes; limbs die or break off.

Cause: Borers. Prune off borer-infested branches. If you see borer holes in your trees, probe into them with a flexible wire or inject a solution of parasitic nematodes. After treatment, seal holes with putty.

Needles tunneled.

Cause: Leafminers. The brown larvae of the pine leafminers enter the leaves and excavate them. Injured tips turn

yellow and dry up. The most effective control is handpicking and destroying infested leaves. Chemical controls are usually ineffective because the larvae are protected within the leaves for most of their lives.

Branches with knot-like swellings.

Cause: Gall rusts. Large galls up to several inches form on branches and eventually release yellowish spores. Control by pruning the galls from pine trees as soon as you spot them.

HEMLOCKS

Hemlocks are an important forest species, considered a foundation or keystone species, one that creates and sustains an ecosystem. Large stands of hemlocks can be found in natural areas including the Steep Rock Preserve in Washington, CT where some important research is being done. More on that later.

For the homeowner, hemlocks are often used as attractive hedges, where they can be allowed to grow naturally or be pruned to any height and width. They are best adapted to moist, cool locations. They are shallow-rooted and easily transplanted. They prefer moist, acid-rich soil and will flourish in sun or partial shade.

Needles yellow; stems and needles covered with small bumps.

Cause: Scales. Several kinds attack hemlocks. Scrape off minor infestations of scale with fingernail. Prune out badly infested growth or use a soft brush and soapy water to gently scrub scales off the stems. Apply a dormant oil spray to the trunk and branches before growth starts in spring, or superior oil during the growing season.

Branches with brown tips.

Cause: Spruce budworms. These worms tunnel into opening buds, destroying the terminals and gradually migrating to younger foliage. Handpick works if only a few caterpillars. If numerous, apply BTK. Reapply after rain.

Plant defoliated.

Causes: Hemlock loopers; gypsy moths. Loopers usually appear in June. Handpick small populations. Control large infestations with BTK. For Gypsy moths feed mainly at night and crawl down the trunk every morning. To trap them, wrap a wide piece of burlap around the trunk, tie it in the center and fold over the top half. Check the band every afternoon and collect and destroy larvae. From late April through mid-June spray leaves with BTK every 10-14 days and after each rain.

Plant defoliated; branches bear cocoon-like bags.

Cause: Bagworms. Handpick and destroy the bags; as soon as you notice caterpillars, start program of spraying with BTK applied every 10 day for after a heavy rain through midsummer.

Needles light gray or bronze.

Cause: Spider mites. Control in spring with dormant oil before growth starts. During active growth, spray plants repeatedly with strong jets of water. For severe infestations, make 2 applications of insecticidal soap 7-10 days apart.

Needles drop; plant weak or dead.

Cause: Hemlock woolly adelgids.

Signs are white egg masses that appear in late winter and early spring. Damage is done spring through summer as nymphs feed on twigs and leaf bases. Control by spraying trunk and branches in early spring with dormant oil. Repeat the spraying in June and October with insecticidal soap or superior oil.
UPDATE: The research as mentioned above and done by scientists at the Connecticut Agriculture Experiment Station has found that lady beetles (Sasajiscymnus tsugae beetles) do a wonderful job of destroying woolly adelgids. These beetles may be purchased from Tree Savers, based in Pennsylvania, which sells 3000 to 5000 beetles per week.

Trunk or branches with small holes; limbs die or break off.

Cause: Borers. Keep plants healthy with proper pruning, mulching and watering. Avoid wounding bark. Prune off borer infested branches. If you see borer holes in your trees, probe into them with a flexible wire or inject a solution of parasitic nematodes. After treatment, seal holes with putty.

Branch tips die back.

Causes: Blight due to sun scorch or drought. Cut off and destroy dead or diseased wood. During periods of drought, water deeply and regularly. Thick mulch may also help.

Needles yellow and drop.

Cause: Rust. Indicated by whitish blisters on undersides of needles followed by needle drop. Prune out and destroy infected branch tips.

Trunk or branches with oozing lesions; branch tips die back.

Cause: Canker. Remove and destroy affected branches. Cut away cankered area along with 2″ of healthy bark. Heavily diseased plants cannot be cured and should be removed. Best prevention is good growing conditions. Avoid damaging plants with lawn mowers, string trimmers or pruning tools to prevent wounds.

SPRUCE

Spruces can reach a majestic 100' in height, making them an impressive specimen tree. They are frequently sold as Christmas trees and if you buy the bagged kind to be planted in your yard, make sure you have enough room to let the tree reach its normal size. They grow quickly! Spruces need a moist but well-drained slightly acidic soil with lots of organic matter. Be aware that oil sprays may remove the blue color from blue spruce foliage until new foliage is produced.

Branches with brown tips.

Cause: Spruce budworms. These tunnel into opening buds, destroying the terminals and gradually migrating to the younger foliage. Handpicking works if only a few caterpillars are present. Usually however, they are so numerous as to require an application of BTK. Reapply after a rain.

Leaves light gray or bronze.

Cause: Spruce spider mites. These damage needles and can kill young trees. Control in spring with dormant oil before growth starts. During active growth, spray repeatedly with strong jets of water. For severe infestations make 2 applications of insecticidal soap 7-10 days apart.

Shoot tips with conelike swellings.

Cause: Spruce gall adelgids. If there are only a few galls, prune them off before they open in July. For serious infestations, spray with insecticidal soap as new growth starts in the following spring. Or apply a dormant oil spray over the whole plant in late winter.

Needles discolored; branch tips webbed.

Cause: Spruce needleminers. These caterpillars feed at base of needles and sometimes web together the needles at the tips of twigs. Control by spraying with a strong blast of water in fall or late winter to knock the webs and loose needles from the tree. Clean up all fallen debris.

Plant defoliated; branches bear cocoon-like bags.

Cause: Gypsy moths; sawflies. Handpick and destroy the bags. As soon as you see caterpillars, start a program of spraying with BTK applied every 10 days or after a heavy rain through midsummer.

Needles skeletonized.

Causes: Japanese beetles, sawflies. Pheromone traps for Japanese beetles are most effective if used throughout the neighborhood. Apply milky spores to your lawn for long-term larval control. Handpick beetles in early morning when the beetles move more slowly if there are only a few. Control sawfly larvae as soon as you spot them by handpicking or spraying needles with insecticidal soap.

Terminal shoot curled and brown.

Cause: White pine weevils. Pale yellow larvae bore into terminal shoot while adult weevils emerge in late summer to feed on buds and bark. Early in season cut off damaged shoots several inches below the affected area.

Trunk or branches with small holes; limbs die or break off.

Cause: Borers. Prune off borer-infested branches. If you see borer holes, probe into them with a flexible wire or inject a solution of parasitic nematodes. After treatment seal holes with putty.

Needles yellow; stems and needles covered with small bumps.

Cause: Scales. If possible scrape off minor infestations with your fingernail. Prune out badly infested growth, or use a soft brush and soapy water to gently scrub scales off stems. Apply a dormant oil spray to the trunk and branches before growth starts in spring, or a superior oil during the growing season.

Trunk or branches with oozing lesions; branch tips die back.

Cause: Canker. Cankers are caused by several types of fungi. Remove and destroy affected branches. If possible, cut away and destroy the cankered area

along with 2″ of the healthy bark. Heavily diseased plants cannot be cured and should be removed and destroyed. Best prevention is good growing conditions avoiding any damage to plant by lawn mower, trimmers or pruners.

Branch tips die back.

Cause: Sometimes called blight caused by a fungal disease. Leaves shrivel and twigs die back. Cut off and destroy dead or diseased wood.

Leaves yellow and drop.

Cause: Rust. Prune out and destroy infected branch tips. To reduce the spread spray with sulfur, repeating 2 or 3 times at weekly intervals.

Sources:

The Organic Handbook of Natural Insect and Disease Control, edited by Ellis and Bradley, Rodale Garden Books, ©1993

Danbury News-Times article June 26, 2020, "Lady Beetles Spell Doom for Adelgids that Destroy Hemlocks," Robert Miller

Fine Gardening magazine, "Needle Drop on Everygreen Conifers," August 2020

Organic Methods for the Care of Roses

Mary Wilson

"I don't know whether nice people tend to grow roses or growing roses makes people nice."
~Roland A. Browne

"There is simply the rose; it is perfect in every moment of its life." *~Ralph Waldo Emerson*

There are many reasons to love roses: the beauty and aroma they add to the garden, the romantic association we have for them, and the historic references which have come down through the centuries. As much as may want roses in our yard, many varieties come with special problems which may require chemical interventions. This chapter gives you some ideas about how you can have the best of both worlds, your roses and a yard that is pesticide free.

General Considerations

Choose extremely hardy and disease resistant varieties. In Connecticut these roses can be seen at the EarthKind Rose Trail Garden at Naugatuck Community College.

Nancy DeBrule, owner of Natureworks in Branford, CT, recommends Knock-Out, Double Knock-Out and Pink Knockout; Home Run (Red Knockout); Easy Elegance Series (ComoPark, Kiss Me, Sunrise sunset and Kashmir); Cinco de Mayo; Chickles; Hot Cocoa; Lady Elsie May; Oso Easy Series (Oso Easy Paprika and Oso Easy Cherry Pie; Drift Series (Coral Drift); Rugosa hybrids; Flower Carpet Series (Pin, Red and Appleblossom); Scarlet Meidiland; and Palmengarden Frankfurt.

Good Soil and Drainage

Good soil is key. Healthy soil contains lots of micro-organisms, including beneficial fungi. Soil which drains well is preferable. Too much water at the root level will kill beneficial micro-organisms.

Organic Feeding

You can encourage the growth of beneficial organisms by feeding them organic fertilizer, either granular or liquid. Roses love compost and they thrive in rich soil. Feed with compost/organic matter in spring and in July. Do foliar spraying in August during hot weather.

Watering

Water plants low to the ground, and water deeply. This avoids fungal growth on foliage and blooms.

Sunshine

Plant to get at least 6 hours of sun daily.

Pruning

Pruning properly is important to allow air flow through the plant, making it less susceptible to fungus. Replace old woody stems with more productive younger wood. Remove any dead or diseased canes, remove twiggy canes, and remove sucker growth below the graft. Reduce size of plant to ¼ or ⅓. Most rose pruning is done in the spring before blooms start to show.

Prune by cutting ¼″ to ½″ above an outward- facing bud eye (a small bump found where a leaf would meet the stem). New stems grow in the direction of the bud and the goal is to encourage them to grow outward, not inward. Make cuts at a 45-degree angle sloping away from the bud, allowing water to run off. During the flowering season, deadheading will encourage more blooms and maintain an attractive shrub.

Practice IPM (Integrated Pest Management)

IPM requires that any problems should be addressed by starting with the least toxic alternative first. Many times removing the insects by a strong spray of water will take care of the problem. Spray with chemicals ONLY when you have a significant problem. Any spraying with chemicals (organic) should be done targeting the problem area only. Never blanket spray.

Encourage Beneficial Insects

Provide plants that beneficial insects like for their nectar, such as those in the Umbelliferae family: Queen Ann's Lace, bronze fennel, dill, lovage, parsley and daisies of all sorts. Examples of beneficial insects are ladybugs (ladybeetles), dragon flies, lacewings, etc. For more information about beneficials see article starting on page 11, "Heroes of the Garden" or go to www.propollinators.org, then Safe Pesticide Alternatives and then Beneficial Insects and Biological Controls.

Good Sanitation

Clean up and properly dispose of any leaves or plants that have been damaged by insects or diseases. Clean up around plants in the spring before top dressing.

Do not use yellow sticky cards for thrips and midges. These cards can trap bees and other beneficial insects.

Note: Rugosa roses can be damaged by insecticide and fungicide sprays. Avoid spraying their leaves.

The Specific Insect and Fungal Control Information that follows is from:

The Organic Gardener's Handbook of Natural Insect and Disease Control, Ellis and Bradley, Rodale Press

Leaf Problems

Leaves wrinkled and discolored **Cause:** Aphids.

Spray plants vigorously with water several times a day for 2-3 days to knock off pests. Encourage ladybugs and other beneficials. If problem persists, spray every 2-3 days with insecticidal soap until pests are under control. Minimize risk from insecticidal soap to bees by spraying at night or very late in evening when bees are not present.

Leaves skeletonized; buds & flowers damaged
Causes: Japanese beetles; sawflies; bristly rose slugs.

Hand pick Japanese beetles early in morning if only a few. Knock them into a jug of soapy, oily water. Using garlic and hot pepper wax sprays may help to repel the Japanese beetles. Pheromone traps for Japanese beetles are available, but these may attract beetles from neighboring yards. Apply milky spore to lawn areas and water well as grubs are the larval stage of the beetles.

For sawflies (rose sawfly or curled rose sawfly) and bristly rose slug: monitor by checking undersides of leaves for little green worms. Control larvae as soon as you spot them by handpicking which is effective but be sure to wear gloves as handling these pests can irritate your skin. For bad infestations use insecticidal soap. Minimize risk to bees by spraying at night or very late in evening when bees are not present.

Leaves & stems with black spots **Cause:** Black spot, a fungus.

Mulch will prevent the spores from spreading to leaves. Pick off and destroy all diseased leaves and clean up all fallen ones. A 0.5 percent solution of baking soda may help control black spot. Dissolve 1 tsp. baking soda in quart of warm water and spray plant thoroughly.

Leaves with powdery white coating **Cause:** Powdery mildew.

Can be serious for some roses. At first sign of disease, pick off affected parts. Provide good air circulation.

Flower buds fail to open **Cause:** Thrips.

Encourage natural predators. If damage is severe, spray weekly with insecticidal soap. (Do not use yellow sticky cards as beneficial insects may be trapped.)

Note: Becky Martorelli offers a creative way to deal with thrips and midges, an alternative to yellow sticky cards which can capture beneficial insects. She uses yellow or blue inverted Solo cups which she treats by covering the entire cup inside and out with spray type cooking oil. The oil will run off at first. Leave the cup in the sun and it will get sticky. Spray again the next day. Place inverted in the garden area on plastic, metal or bamboo sticks. They should be at the level of the plant you are protecting and leaning outward about 12″. Unwanted insects will be attracted to the inside of the cups and be captured there. No harm to bees or other pollinators!

Yellow stippled leaves; foliage webbed **Cause:** Spider mites.

Spray plants thoroughly with water especially the undersides of the leaves 2-3 times a day for several days. For severe infestations, spray with insecticidal soap. Minimize risk to bees by spraying at night or very late in evening when bees are not present.

Leaves with yellow-green mottling **Cause:** Viral diseases.

Insects spread viruses so keeping insect pests under control will reduce chances of viral problems. Destroy infected plants immediately.

Leaves skeletonized, flowers eaten
Cause: Rose chafers, aka rose bugs.

Handpicking is the best control. Reduce populations of larvae by treating lawn areas with milky disease spores.

Leaf undersides with powdery orange pustules **Cause:** Rust.

Pick off and destroy infected leaves.

Leaves stippled with white **Cause:** Leaf-hoppers.

Spray with insecticidal soap, repeating as necessary. Minimize risk to bees by spraying at night or very late in the evening.

Leaves yellow; stems and leaves covered with small bumps
Cause: Scales.

If possible, scrape off all minor infestations with your fingernail. Prune out badly infested growth. Use a soft brush and soapy water to scrub scales off stems. Apply a dormant oil spray before growth starts in spring, or a superior oil during the growth season. Both these oils can be harmful to bees so any spraying should be done at night or very late in the evening.

Leaves skeletonized or large holes; webbed branches
Cause: Caterpillars.

Several kinds feed on foliage including tent caterpillars and webworms. Control by manually destroying their nests or egg cases, spraying leaves with BTK (*Bacillus thuringiensis var. kurstaki*) at first sign of damage. Be aware that BTK is safe for bees but can be harmful to butterflies and moths. Spray on unwanted caterpillar nests only.

Other Issues

Canes with discolored or dead areas **Cause:** Cankers.

The best approach is to prune off and destroy diseased canes.

Flowers fail to open; petals with holes **Cause:** Beetles (rose curculios are bright red; rose leaf beetles are blue or green).

Handpicking is the best control. Remove and destroy infested buds.

Flower buds/new shoots deformed or dead **Cause:** Rose midges.

Cut off and destroy all infested buds to reduce further damage.

Shoot tips wilted; large holes in leaves **Cause:** Leafcutter bees.

Control by pruning out the injured tips several inches below the damaged area. Seal the cut end of the came with grafting wax or putty to prevent bees from burrowing into canes. Remember, a few holes in leaves is not a real problem.

Shoot tips die back; canes swollen or with small holes
Cause: Stem girdlers and borers.

Cut off and destroy all dead and dying wood.

Buds fail to open; turn brown **Cause:** Botrytis blight, a fungal infection. Pick off and destroy diseased blooms; spray plants weekly with sulfur.

Trunk or roots swollen, wart-like growths **Cause:** Crown gall.

If infection is mild, prune out diseased growth. Afterward, disinfect pruners with bleach solution. Destroy severely infected plants. This disease remains viable in the soil for several years without a host, so avoid replanting susceptible plants.

References:

Barbara Ellis and Fern Marshall Bradley, "The Organic Gardener's Handbook of Natural Insect and Disease Control," Rodale Press, 1992, 534 pp.

DuBrule-Clemente, Nancy "Growing Roses Without a Chem Lab," Connecticut Gardener, March/April 2012, pp. 3-5

Martorelli, Becky, email dated February 28, 2020.

Protect Our Pollinators web site, www.propollinators.org.

Hummingbirds in the Garden

Dottie Evans

Tell me, O Rose, what thing it is
That now appears, now vanishes?
Surely it took its fire-green hue
From daybreaks that it glittered through;
Quick, for this sparkle of the dawn
Glints through the garden and is gone!
What was the message, Rose, what word:
Delight foretold, or hope deferred

~ Edwin Markham

With their jewel-like colors, zooming flight, territorial displays, and feisty nature—hummingbirds have it all and their presence in our gardens adds life and color. Consider how far they have traveled to get here! After spending the winter in Florida, Mexico, or Central America, hummingbirds begin their northward migrations in late February and early March. Many species fly 500 miles nonstop (at 30 mph) over the Gulf of Mexico. Some are headed west for Texas and California while others will fly east of the Rocky Mountains to the Midwest or Eastern Seaboard.

Ruby-throated hummingbirds are the only species regularly seen east of the Mississippi River and they usually arrive in Connecticut around the first of May. We want to be ready to welcome them.

The males arrive first.

Hummingbirds may live up to 12 years and they like to return to the same garden they've visited before—often on the very same date with the males arriving ahead of time to establish territories. If I forget to put out my feeder, I might look out my kitchen window one day to find a handsome male hovering expectantly over the exact same spot where the feeder was hung last year. So I hurry to make the nectar and hang the feeder.

Brewing the nectar is easy and quick.

Add ¼ cup of granulated sugar to 1 cup of tap water and stir to a boil or until dissolved (5 minutes). Any extra nectar can be refrigerated for up to 2 weeks.

No matter how much nectar you are making, the ratio is always the same: 1 part sugar to 4 parts water. ***NEVER*** add red food coloring or dyes and avoid using soap to clean the feeder. Simply wash by hand in hot water. Then refill with fresh nectar and you're good to go for 2-3 days. Hot weather speeds fermentation, turning the nectar cloudy and rancid. If the weather is cool, the nectar might last 4-5 days.

Ants invading? If you notice hummingbirds flying nervously around the feeder but not stopping for a sip, it's likely that ants have found their way into the nectar by climbing the pole. One solution is to trim any nearby foliage that gives them access. Another is to install an "ant moat" which is cup of clear water suspended over the feeder trapping them on their way down. This inexpensive device can be purchased at Wild Birds Unlimited in Brookfield or at most bird supply stores.

Females are shy while males defend and display.

Once a hummingbird pair has set up housekeeping in your garden you can settle down to watch the show—though you may never know exactly where the nest is located. The pale green female is furtive, quick to come and go. She doesn't seem to visit the feeder as often, perhaps because she is sitting on eggs and doesn't like leaving the babies unattended.

Meanwhile, the male feeds at his leisure. He likes to perch nearby watching out for interlopers and he will promptly attack any other male hummer hoping to steal a sip in passing. His ruby ascot appears black in shadow, but it flashes iridescent red in bright sunlight. He likes to show off his acrobatic skills with a series of deep-dive, swinging arcs that rise and descend at 60 mph. I've been lucky to catch this impressive display only twice in all the years I've put out hummingbird feeders.

The youngsters arrive and the males leave.

After incubating her two eggs and then feeding the young at the nest, the female will one day show up with fledglings in tow. It's not long before they are sipping nectar for themselves though their behavior and appearance clearly mark them as juveniles. They are hesitant but at the same time hyperactive. Mostly, they enjoy zooming around while practicing their flying skills and feint-fighting on the wing. As the summer goes on juvenile males develop a delicate necklace of tiny black dots under their chins. Over the winter, these markings will be replaced by the deep crimson plumage typical of adult male hummingbirds in prime breeding form.

All too soon it is August and the days are getting shorter. While the females will linger in your garden with their young, the males are preparing to migrate south and before you know it, they are gone. By September the entire hummingbird family will have departed.

But don't take down that feeder. Leave it up for a couple of weeks, keep it filled with fresh nectar and watch to see if any migrants from up north pass through. They'll be grateful for a sip and a quick energy boost during their long journey south. And who knows? One of them may remember where you live and return to your garden next spring.

Earth-Friendly Gardening

One yard at a time




Protect Our Pollinators

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