



MIDDLETOWN
Rhode Island

PLANNING DEPARTMENT

TOWN OF MIDDLETOWN

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To: Paul Croce, Chair
Planning Board members

From: Ron Wolanski, Town Planner

Date: March 5, 2024

Re: Review and recommendation to the Town Council on draft fertilizer and pesticide use policy.

This item was continued to the March 13th Planning Board meeting in order to address revisions requested by the Open Space & Fields Committee relative to adding language to address pesticide impacts, particularly impacts on pollinators. Attached is the revised draft policy with changes made since the last version identified. Also attached is some background information on certain pesticides provided by the Open Space & Fields Committee.

Once the Planning Board has reviewed the policy document and any additional revisions are made, the proposal and the board's recommendation should be forwarded to the Town Council for consideration. The Town Council would then consider potential adoption.

Please feel free to contact me with any questions.

Cc: Town Administrator
Town Solicitor

POLICY 20. Fertilizer and Pesticide Use Policy

Effective Date: 00/00/2024

1.0 PURPOSE

The purposes of this Land Usage Policy Statement are to:

1. State the Town of Middletown's view regarding nutrient fertilizer and pesticide use.
2. Formulate policies and guidelines to assist the Town of Middletown develop a framework that achieves the following goals:
 - a. Encourage planting and maintenance of minimally managed turf areas;
 - b. Comply with the total daily maximum loads (TMDL) for the Town's water resources prescribed by the Rhode Island Department of Environmental Management;
 - c. Develop standards that will allow reasonable use of fertilizers and pesticides for the enhancement and maintenance of turf quality;
 - d. Reduce or eliminate the unnecessary use of chemicals in our environment;
 - e. Conserve valuable waterways and other resources that increase property values, protect the unique environment vital to the Town's economy, and reduce the financial burden on taxpayers and property owners by regulating the outdoor application of nitrogen, phosphorus, and pesticides on turf;
 - f. Help achieve the goals of the Town of Middletown's Comprehensive Community Plan.
 - f.g. [This policy aims to protect pollinators, including bees and other beneficial insects, by limiting the use of nicotine pesticides in residential settings.](#)
3. Encourage agricultural users that customarily utilize fertilizer and pesticides as well as public and private golf courses to participate in voluntary programs at the state level, including using fertilizers and pesticides in a manner consistent with best management practices (BMP)s, Good Agricultural Practices, etc.
- 3.4. [Educate residents of Middletown on limitations of pesticides per RIGL 23-25-40\(a\)\(2\) – Pesticide Control and provide them with alternative pest control application methods.](#)

2.0 SCOPE

This policy shall apply to all applications of nitrogen and phosphorus through fertilizer and applications of pesticides within the Town of

Middletown, subject to the exemptions listed in Section 6. [Nothing in this policy shall run counter to provisions of RIGL 23-25 Pesticide Control.](#)

3.0 FINDINGS AND GENERAL PRINCIPLES

The purpose of this policy is to promote, in the public interest, the labeling, distribution, sale, storage, transportation, use and application, and disposal of pesticides and fertilizers as defined in this policy. The Town finds that pesticides are valuable to our state's agricultural production and to the protection of human life and the environment from insects, rodents, weeds, and other forms of life which may be pests; but it is essential to the public health and welfare that they be regulated to prevent adverse effects on human life and the environment. Pesticides may cause injury to man, or may cause unreasonable adverse effects on the environment if not properly used. Pesticides may injure human life or animals, either by direct poisoning or by gradual accumulation of pesticide residues in the tissue. Crops or other plants may also be injured by their improper use. The drifting or washing of pesticides into streams, lakes, or other bodies of water may cause appreciable damage to aquatic life. A pesticide applied for the purpose of killing pests in a crop which is not itself injured by the pesticide, may drift and injure other crops or non-target organisms with which it comes in contact.

There is sufficient scientific evidence demonstrating that excessive nutrient enrichment of and pesticide addition to water resources can have numerous and various, significant negative impacts. For example, public health risks from excessive loading of nutrients to water resources may include direct detrimental effects on drinking water sources by increased concentrations of nitrogen and phosphorus that can violate safe drinking water standards. Additionally, degradation of the quality of water resources can have significant negative impacts to the local and regional economy, and the fiscal well-being of the Town of Middletown. The Town of Middletown's soil characteristics mean that agronomic practices of soil fertilization and pesticide applications common in other parts of the region, state, and country may not always apply in the Town of Middletown, as these practices vary by soil type. Scientific literature demonstrates that a significant potential source of nutrient loading to water resources is from inappropriate, excessive and/or improper use of turf fertilizer. As recognized by RIGL §46-30-2, water resources are a critical renewable resource which must be protected.

As recognized by RIGL §23-25-3, the drifting or washing of pesticides into streams, lakes, or other bodies of water may cause appreciable damage to aquatic life. The Town of Middletown seeks to restore, preserve, and enhance the quality of surface waters and to protect the waters from discharge of pollutants so that the waters shall be available for all beneficial uses and thus protect the public health, welfare, and the environment. Accordingly, the Town issues this policy statement to encourage parties exempted under Chapter 153.84(B)-(C) of the Town of Middletown Zoning Ordinance, namely agricultural users that customarily utilize fertilizer and pesticides and public and private golf courses, to participate in voluntary programs at the state level, including using fertilizers and pesticides in accordance with best management

practices (BMPs), Good Agricultural Practices, the Obsolete Pesticides Prevention Program, the RI Pollutant Discharge Elimination System Program, and the Green Golf Course Certification Program.

[A growing body of scientific literature shows that pesticide exposure can adversely affect humans and insect pollinators even at low levels. Neonicotinoids are a group of insecticides widely used in agriculture, turf management, ornamentals and residential settings. Their impact on pollinators, especially bees, has raised concerns about environmental health.](#)

4.0 DEFINITIONS

For the purposes of this Policy Statement, the following definitions shall apply:

AGRICULTURE/AGRICULTURAL USE. Land uses normally associated with the production of food, fiber and livestock for sale. This includes farming in all its branches, generally as the cultivation and tillage of the soil, dairying, the production, cultivation, growing and harvesting of any agricultural, floricultural, viticultural or horticultural commodities. For purposes of this chapter, such uses shall not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

APPLICATOR. Any individual or entity that applies fertilizer or pesticides to turf or soils.

BEST MANAGEMENT PRACTICE (“BMP”). A structural device or a nonstructural practice for pollution management, which is deemed to provide the best available treatment or control of a pollution source such as stormwater. For purposes of this Chapter, BMP means the “Lawn and Landscape Turf Best Management Practices,” from the University of Massachusetts Amherst Center for Agriculture, Food and the Environment, or the New England Regional Nitrogen and Phosphorus Fertilizer and Associated Management Practice Recommendations written by the University of Connecticut College of Agriculture and Natural Resource.

CERTIFIED COMMERCIAL APPLICATOR. Any commercial applicator who is certified under § 23-25-13 as authorized to purchase, acquire, apply, or supervise the application of a pesticide classified for restricted use by EPA or limited use by the director.

CERTIFIED PRIVATE APPLICATOR. Any private applicator who is certified under § 23-25-14 as authorized to purchase, acquire, apply, or supervise the application of any pesticide classified for restricted use by EPA or limited use by the director.

COMBINATION PRODUCTS. Sometimes colloquially referred to as “weed and feed,” any product that, in combination with fertilizer, contains post-

emergence herbicides, insecticides, other pesticides, or plant growth regulators.

COMMERCIAL APPLICATOR. Any person (whether or not that person is a private applicator with respect to some uses), including employees of any federal, state, county or municipal agency, department, office, division, section, bureau, board, or commission, who applies or supervises the application of any pesticide for any purpose or on any property other than as provided by the definition of “private applicator”.

COMPOST or ORGANIC COMPOST. The biologically stable, humus-like material derived from composting or the aerobic, thermophilic decomposition of organic matter.

ENVIRONMENT. The water, air, land, and all plants and humans and other living animals in it, and the interrelationships which exist among these.

FERTILIZER. A substance that enriches the soil with elements essential for plant growth, such as nitrogen, phosphorus, potassium or other substances; fertilizer does not include those nutrients that are normally excluded from fertilizer such as chemicals that are part of horticultural gypsum, dolomite, limestone, lime, Jersey greensand, grass clippings, or compost topdressing.

HEAVY RAIN EVENT. A rainfall greater than 0.25 inches per hour, or a rainfall greater than one (1) inch total in a twenty-four (24) hour period.

IMPERVIOUS SURFACE. Any structure, surface, or improvement that reduces or prevents absorption of stormwater into land, and includes concrete, asphalt, paver blocks, gravel, decks, patios, elevated structures, and other similar structures, surfaces, or improvements.

LABEL. The written, printed, or graphic matter on, or attached to, the pesticide or fertilizer or device or any of its containers and wrappers.

LICENSED COMMERCIAL APPLICATOR. Any commercial pesticide applicator who is licensed under RIGL §23-25-12 as authorized to use or supervise the use of any pesticide not classified for restricted use by the United States Environmental Protection Agency or limited use by RIDEM on land not owned or rented by the commercial pesticide applicator.

NITROGEN. An element essential to plant growth. For the purposes of this chapter, nitrogen may be available as slow-release, controlled-release, timed-release, slowly available, or water-insoluble nitrogen, which means nitrogen in a form that delays its availability for plant uptake and use after application and is not rapidly available to turf and other plants; and/or quick-release, water-soluble nitrogen which means nitrogen in a form that does not delay its availability for turf and other plant uptake and is rapidly available for turf and other plant uptake and use after application.

NONPOINT SOURCE POLLUTION. Pollution from any source that is not discernible, confined and discrete. Potential sources of nonpoint source

pollution include, but are not limited to, stormwater runoff, agriculture, silviculture, mining, construction, septic systems and urban development.

NUTRIENT. Any of the following seventeen (17) elements needed for growth of a plant: the three non-mineral elements: carbon, hydrogen, and oxygen; the six macronutrients nitrogen, phosphorus, potassium, calcium, magnesium, and sulfur; and the eight micronutrients: boron, copper, iron, chlorine, manganese, molybdenum, nickel and zinc.

PESTICIDE. Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest; and any substance or mixture of substances for use as a plant regulator, defoliant, or desiccant.

PHOSPHORUS. An essential plant nutrient, phosphorus fertilizers are used for replenishing phosphorus in soil, produced commercially from phosphate rock and apatites, including such organic substances as bone meal and manure and such phosphorus-rich industrial wastes as basic slag and Thomas slag.

PRIVATE APPLICATOR. Any person who uses or supervises the use of any pesticide for purposes of producing any agricultural commodity on land owned or rented by him or her or his or her employer or (if applied without compensation other than trading of personal services between producers of agricultural commodities) on land of another person.

RECHARGE. The replenishment of underground water reserves.

SATURATED GROUND. Soil soaked with moisture such that it cannot absorb any more liquid.

STORMWATER RUNOFF. Flow on the surface of the ground, resulting from precipitation.

TURF. Any non-crop land area that is covered by any grass species, excluding meadows, grasslands, flower or vegetable gardens, pasture, hay land, trees, shrubs, turf grown on turf farms or any form of agricultural production or use.

WETLAND. An area, as defined by RIGL §2-1-14 (Coastal Wetland) and RIGL §2-1- 20 (Freshwater Wetland) and as determined by the Rhode Island Department of Environmental Management or the Coastal Resources Management Council, which is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

5.0 GUIDELINES

Performance Standards for Fertilizer Application

The care and maintenance of residential and commercial lawns, gardens, and other landscaped areas in the Town of Middletown can contribute to water quality degradation. Further, excessive amounts of fertilizers, inappropriate formulations, and poor timing of application can result in adverse impacts to stormwater runoff and water quality in our ponds, lakes, streams and coastal waters.

1. The Town of Middletown encourages all uses and applications of fertilizer within the Town of Middletown to comply with the following best management practices:
 - a. All fertilizer applications shall follow and be performed in accordance with BMPs found either in the University of Massachusetts Extension's *Best Management Practices for Lawn and Landscape Turf*, the University of Connecticut College of Agriculture and Natural Resource's *New England Regional Nitrogen and Phosphorus Fertilizer and Associated Management Practice Recommendations*, or the New England Interstate Water Pollution Control Commission's *Regional Clean Water Guidelines for Fertilization of Urban Turf*.
 - b. All fertilizer applications shall follow and be performed in accordance with the relevant criteria set forth in Rhode Island Department of Environmental Management's *Sustainable Turf Management for Landscaping*, including:
 - i. Read and understand the product label instructions, information and warnings, including the timing and methods of application, safety precautions, restrictions; and any specific disposal procedures; and apply, use, store and dispose of fertilizer in accordance with label instructions, information and warnings.
 - ii. Conduct soil tests for nutrients. Phosphate fertilizers are used only if a soil test concludes its use is warranted. Follow guidelines in soil test analysis on how much phosphate fertilizer to apply.
 - iii. Use nitrogen fertilizers that contain 50% or more of the total nitrogen (TN) as slow-release nitrogen (SRN).
 - iv. If soil testing is not used, apply no more than 1 lb. / 1000 sq. ft. of phosphate fertilizer to establish new turf.
 - v. Fertilizer equipment is correctly calibrated prior to each use.
 - vi. Fertilizers containing nitrogen or phosphorus should not be applied to turf closer than one hundred (100) feet to any water body or wetlands, or on steep slopes where stormwater runoff flows directly into surface waters or wetlands.
 - vii. Fertilizers containing nitrogen or phosphorus should not be applied to saturated ground.

- viii. Fertilizers containing nitrogen or phosphorus should not be applied to paved or otherwise impervious surfaces. If these fertilizers are incidentally applied to impervious surfaces, any spillage should be immediately contained and removed to prevent run-off.
- ix. Before applying fertilizers containing nitrogen or phosphorus, the applicator should cover stormwater conveyances (including, but not limited to storm drains, ditches, and swales) with a tarp, drop-cloth, or similar covering.
- x. Fertilizers containing phosphorus should not be applied unless a soil test within twelve (12) months of application is conducted and reveals an available phosphorus deficiency or unless establishing new turf or re-establishing or repairing turf after substantial damage or land disturbance, in which case the application shall be in compliance with the BMP.
- xi. The fertilizer application requirements of this subsection shall apply with the same limitations to combination products as defined in the policy.
- xii. Unused fertilizers containing nitrogen or phosphorus should not be over-applied to grass; dumped into storm drains, wetlands, or water bodies; or emptied into a toilet or sink.
- xiii. Lawn clippings fertilized with nitrogen or phosphorus fertilizers should not be allowed to collect on impervious surfaces; nor dumped into water bodies, storm drains, or wetlands.
- xiv. Never apply fertilizer to bare ground except for re-seeding.
- xv. Apply no more than 3.25 lbs of total nitrogen/ 1000 sq. ft per year.
- xvi. Apply no more than 2.0 lbs of total nitrogen /1000 sq. ft. per year in environmentally sensitive areas.
- xvii. Use weather forecasts to determine fertilizer application times. Never apply within 48 hours of a heavy rain event.
- xviii. Return any unused fertilizer to its original container after each use.
- xix. Do not apply fertilizer during summer dormancy. Do not apply fertilizer during winter months on frozen or partially frozen ground.

Pesticide Application Control

As recognized in RIGL §23-25-3, pesticides may cause injury to people, or may cause unreasonable adverse effects on the environment if not properly used. The drifting or washing of pesticides into streams, lakes, and other bodies of water may cause appreciable damage to human life or animals, either by direct poisoning or gradual accumulation.

1. The Town of Middletown encourages all uses and applications of pesticides within the Town of Middletown to comply with the following performance standards:

- a. All commercial pesticide uses and applications shall comply with the Rhode Island Department of Environmental Management's Rules and Regulations Relating to Pesticides, promulgated pursuant to Chapter 25 of Title 23 of the Rhode Island General Laws and Section and 40 CFR §171.5 (a), as applicable.
- b. Any person applying pesticides must be eighteen (18) years of age or older.
- c. Any person engaged in the noncommercial application of pesticides shall:
 - i. Read and understand the label instructions, information and warnings, including the common name of pesticides applied, the pests to be controlled, the timing and methods of application, safety precautions, restrictions; and any specific disposal procedures; and
 - ii. Apply, use, store and dispose of pesticides in accordance with label instructions, information and warnings.
- d. All pest control equipment using pesticides and drawing water from the surface waters of the state or from a potable water supply shall have an effective, Rhode Island Department of Environmental Management approved anti-siphon device to prevent backflow. Any required federal, state, and local permits, as applicable, shall be secured.
- e. No pesticides shall be applied to public water supplies or their tributaries except by legally established water supply entities or their agents as authorized by the Rhode Island Department of Environmental Management.
- f. No person shall apply pesticides in such a manner that allows pesticides to drift or flow into water supplies.
- g. No application of pesticides shall be made by mechanically powered equipment at such times where wind velocity may cause the pesticide to drift beyond target area.
- g.h. Pesticides shall not be applied to any plant during blooming periods to minimize bee exposure.
- h.i. Pesticide containers shall not be used for any purpose, other than the storage of pesticides, unless such purpose has been approved by the Rhode Island Department of Environmental Management.
- j. Only licensed or certified commercial applicators shall apply pesticides within any commercial or public building or on the grounds of any school, and no pesticide shall be applied in any building or on the grounds of any school during regular school hours or during planned activities at the school. This subsection shall not apply to the use of germicides, disinfectants, sanitizers, deodorizers, antimicrobial agents, insecticide gels, non-volatile insect or rodent bait in a tamper resistant container, insect repellants, pesticides applied by public health officials during a state public health emergency, or exempt pesticides under 40 CFR §152.25.

2. A growing body of scientific literature shows that pesticide exposure can adversely affect humans and insect pollinators even at low levels. Neonicotinoids are a group of insecticides widely used in agriculture, turf management, ornamentals and residential settings. Their impact on pollinators, especially bees, has raised concerns about environmental health. RIGL 23-25-40 – Pesticide Control, as amended, with a policy effective date of Jan 1, 2024 restricts Neonicotinoids as follows:
 - a. All pesticides registered in the state that contain one or more neonicotinoids and are labeled as approved for outdoor use are hereby immediately classified as state limited use pesticide. Such pesticides shall not be:
 - i. Sold or distributed to any person other than a certified applicator;
 - ii. Used or applied by any person other than a certified applicator or any person working under the direct supervision of a certified applicator.

6.0 EXCEPTIONS

The following activities are exempt from this policy:

- (A) Agricultural land management activities, including application of fertilizers, carried out in accordance with a conservation management plan that has been approved by the Natural Resources Conservation Service;
- (B) Agricultural pesticide/herbicide applications that comply with RIDEM regulations and subject to any required permits;

7.0 PUBLIC EDUCATION AND OUTREACH

In Rhode Island there is a strong correlation between the amount of impervious area in a watershed and the waterbody within that watershed being listed as impaired by the RIDEM. Increased volume, temperature, and rate of runoff from impervious surfaces, and the concentration of pollutants in the runoff can cause changes in hydrology and impact water quality. Effective management of stormwater runoff offers a multitude of benefits, including protection of wetlands and aquatic ecosystems, improved quality of receiving waterbodies, conservation of water resources, protection of public health, and flood control. A public education and outreach program helps to promote a greater awareness within the community regarding the importance of minimizing storm water impacts as well as the personal responsibilities expected of them. The public education program shall also provide information on the impacts of pesticides on other ecosystems including impacts on pollinators.

1. The Town of Middletown shall engage in the following public education and outreach activities relative to fertilizer and pesticide control:
 - a. Implement a public education program to distribute educational materials in the community or conduct equivalent outreach activities regarding impacts and pollution prevention.
 - b. Enter into partnerships with other governmental or nongovernmental entities, as many may already have educational materials and perform outreach activities.

- c. Use stormwater educational materials provided by other entities instead of developing their own materials, but tailor program materials to address local situations and issues.
 - d. Address the viewpoints or concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children. Direct materials or outreach programs toward specific groups of commercial, industrial, and institutional entities that may have significant stormwater impacts.
2. The Town shall encourage those engaged in public education and outreach activities to use the following BMPs:
- a. Use brochures or fact sheets to educate the general public or specific audiences about stormwater fertilized and pesticide related pollution and the importance of proper stormwater practices;
 - b. Use recreational guides to educate groups such as golfers, hikers, paddlers, windsurfers, climbers, fisherman, and campers about storm water related pollution and the importance of proper storm water practices;
 - c. Use alternative information sources, such as social media, web sites, bumper stickers, refrigerator magnets, and posters at bus stops;
 - d. Create a library of educational materials for community and school groups;
 - e. Engage volunteer citizen educators for a public education task force to educate the general public or specific audiences about stormwater fertilizer and pesticide related pollution and the importance of proper stormwater practices;
 - f. Plan participation events with educational displays at home shows, community festivals, libraries and other public buildings educating the general public or specific audiences about stormwater fertilizer and pesticide related pollution and the importance of proper stormwater practices;
 - g. Develop educational programs for school-age children educating them on stormwater fertilizer and pesticide related pollution and what they can do to help; and
 - h. Use tributary signage along tributaries to increase public awareness of local water resources.

8.0 WATER QUALITY MONITORING

- 8.1.1 The Town shall develop a watershed monitoring program to perform data gathering and analysis on the water quality of surface water resources in Middletown. The goals are to obtain water quality information to assess current conditions, detect trends, and utilize the data to educate the public about water quality issues.

Neonicotinoids

By: Lindsay Barrow

02/2022

WHAT IS A NEONICOTINOID?

- Neonicotinoids are systemic insecticides used on trees, shrubs and crops to eliminate targeted pests
- In residential areas like Middletown and Aquidneck Island, they're primarily used in lawns to control white grubs.
- Some of the more common neonicotinoids used in the northeastern US include imidacloprid, clothianidin and thiamethoxam.
- Brand names include Bayer Advanced, Knockout Ready To Use Grub Killer, Ortho Bug Insecticides

WHY ARE NEONICOTINOIDS BAD?

- Chemicals may help solve one problem, though there's usually several others that are created that will require other chemicals to treat
- Runoff, leaching, and non-targeted organisms are all byproducts of using neonicotinoids and synthetic fertilizers, herbicides and insecticides
- Only 2-20% of the insecticide is actually taken up by the targeted plant
- When absorbed, the neonicotinoid travels to all of the plants' tissues: roots, stem, leaves, flowers, nectar and pollen and will remain active for weeks or months
- As you know, nectar and pollen is what pollinators eat, feed to their young and make honey with (in the case of bees).
- When ingested, neonicotinoids disrupt the function of the insects' neurons and cause paralysis and death in large doses.
- Lower doses have sublethal effects that work by effecting gene expression, which alters brain function and behaviors.
 - In bees, impairment can alter foraging behavior, which decreases pollination, reproduction and ultimately leads to colony death due to the lack of food
- The other 80-98% of the neonicotinoid used leaches into the soil, affects beneficial biota, leaches into water systems and has negative effects on its life and the surrounding environment.
- *Imagine what it's doing to our bodies and health, if we ingest honey or water with leached chemicals!?*

GRUB DAMAGE IN LAWNS

- A common issue in Middletown are lawn grubs (beetle larvae)
- Symptoms include patchy lawns, scratched/dug up areas from critters eating grubs
- 10 grubs per square foot of lawn space is considered a bad infestation
- Symptoms of grubs:
 - Spongy lawn
 - Scratched up areas from animals digging to eat grubs
 - Lawn dieback in early fall
 - Late summer/early fall is the best time to detect grubs
- Grubs can be costly for homeowners and municipalities
 - By damaging turf, costs are needed to mitigate the issue then repair the area

- Neonicotinoids are a temporary band-aid, not a permanent solution.

ALTERNATIVE TREATMENTS AND WAYS TO AVOID CHEMICALS

- What can you do instead of use such harsh insecticides?
- Skip the chemicals altogether.
 - Synthetic fertilizers, herbicides and pesticides will deplete soil fertility and nutrients over time
 - Unhealthy soil decreases water retention, which can cause runoff damage and larger issues for your property
- Start with a soil test – an analysis will help determine what your soil is rich in (or lacking), which will point you in the right direction for any necessary treatments and as a guide for planting new materials
- Go organic: a healthy environment will harbor a healthy lawn and garden.
- Take seasonal care of your lawn: water efficiently, aerate, slice seed seasonally
 - Fall is a perfect time to over seed your lawn, which is a healthy, natural way to avoid a grub problem
- Choose and plant based on your property's natural conditions – don't plant a shade loving shrub in a sunny space.

CREATE FUNCTIONAL YARD SPACE

- There are plenty of alternative ways to make a yard functional with limiting grassy spaces
- Garden space, edible gardens, paths, etc.
- Limit lawn areas to around house or other concentrated areas that have ideal conditions

LANDSCAPE DESIGN

- Organizing landscape spaces is an effective way to mitigate any unnecessary chemical use
- Plan lawn and garden sizes based upon your individual needs
- Choose a variety of plants, which can help provide food and habitats for native birds and other pollinators while acting to control pests
- Property Zones, span 1-5
 - Zone 1: Closest to the house/structure and requiring the highest amount of maintenance (lawn space)
 - Zone 2: Somewhat managed, may include garden spaces, paths and other specimen plants that require some attention
 - Zone 3: Less managed area, meadows, more natural spaces
 - Zone 4-5: Unmanaged area, woodland space, wind buffer zone, etc.

EXAMPLES: (LOCAL) POLLINATOR FRIENDLY PLANTS

NATIVE WEEDS

- Clover, *Trifolium repens*
- Dandelion, *Taraxacum officinale*
- Buttercup, *Ranunculus spp.*
- Creeping Thyme, *Thymus serpyllum*
- Creeping Charlie, *Glechoma hederacea*

NATIVE PERENNIALS

- Coneflowers; Black-eyed susans, *Rudbeckia spp.*; *Echinacea purpurea*
- Giant Hyssops, *Agastache spp.*
- Salvia, *Salvia spp.*
- Sunflowers, *Helianthus spp.*
- Bee Balm, *Monarda spp.*
- Milkweed, *Asclepias spp.*
- Phlox, *Phlox spp*

NATIVE PERENNIAL SHRUBS

- False Spiraea, *Sorbaria sorbifolia*
- Clethra, *Linnaeus spp.*
- Buttonbush, *Cephalanthus occidentalis*
- Blackberry/Raspberry Bushes, *Rubus spp.*
- Blueberry *Vaccinium spp.*
- Rose Bush, *Rosa spp.*

NATIVE TREES

- Sassafras, *Sassafras albidum*
- Willow, *Salix spp.*
- Eastern Redbud, *Cercis canadensis*
- Maple, *Acer spp.*
- Sourwood, *Oxydendron arboretum*

LAWN ALTERNATIVE – SHADE

- Ferns

LAWN ALTERNATIVE – SUN

- Meadow

CONCLUSION

- Pesticide damage doesn't stop with pollinators
- Pollinators are the building blocks to our food chain and are consumed by birds, fish and mammals that are all inadvertently consuming insecticides, with unknown long term effects and potential harm
- Several states have begun to outlaw neonicotinoids:
 - 2016-2019: Maryland, Connecticut, Vermont restrict consumer use of neonicotinoid insecticides
 - September 2020: Canada and the EU bans neonicotinoid pesticides
 - March 2021: Massachusetts votes to restrict outdoor consumer use of neonicotinoid insecticides
 - June 2022: Maine prohibits use of neonicotinoid pesticides in residential landscapes (lawn, turf, ornamental vegetation)
- Every small effort to stop using harsh chemicals helps create change in a bigger picture

REFERENCES:

P.S.A. Bebane et al. *The effects of the neonicotinoid imidacloprid on gene expression and DNA methylation in the buff-tailed bumblebee *Bombus terrestris**. 6/19/2019.

<https://royalsocietypublishing.org/doi/10.1098/rspb.2019.0718>

JL Larson, CT Redmond and DA Potter. *Assessing insecticide hazard to bumble bees foraging on flowering weeds in treated lawns*. 6/12/3013. <https://pubmed.ncbi.nlm.nih.gov/23776667/>

Beyond Pesticides. Maine bans consumer use of neonicotinoid insecticides, with some exceptions. 6/21/2021. <https://beyondpesticides.org/dailynewsblog/2021/06/maine-bans-consumer-use-of-neonicotinoid-insecticides-with-some-exceptions/>

Ley, Elizabeth L. Eastern Broadleaf Forest, Oceanic Province. NAPP and Pollinator partnership.

<https://www.pollinator.org/PDFs/EasternBroadleaf.Oceanic.rx18.pdf>

Photo: Neonicotinoid Life Cycle <https://www.science.org/doi/10.1126/science.1259159>

Photo: toxic-ten Neonicotinoids <https://www.savethebee.org/pesticide-reform/>