#04 Gardening for Biodiversity Series

GOOD GARDEN PRACTICES: UNDERRATED PRACTICES & TOP PLANT PICKS

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PART 1: GOOD-GARDEN PRACTICES

Effective gardening practices play a crucial role in cultivating a healthy garden. While many gardeners are familiar with more common advantageous techniques (e.g., how to remove invasive species), there are also a variety of lesser-known practices that significantly improve sustainability, enhance biodiversity, and ensure long-term ecosystem health. The following is a compiled list of our 10 favorite underrated good gardening practices:

01 - Leave your leaves:
Plant litter comes in many forms including fallen dead leaves, tree bark, needles and twigs. Decomposing plant litter is an important component of soil health, nutrient cycling and biodiversity (Tresch et al., 2019). As such, not raking the leaves or other plant litter in your garden or yard supports a variety of species who overwinter in them including earthworms, butterflies, moths, caterpillars, slugs, spiders, beetles and more (Handa et al., 2014). Outside of supporting biodiversity in your garden and attracting beneficial insects, you will save time and money, and reduce pollution by not using a leaf blower.

02 - Snags a.k.a. habitat trees & standing logs:
Similar to the benefit of leaving plant litter in your garden through the winter time, the same positive impacts to biodiversity are seen when keeping snags, standing logs and dead branches in the garden (Fröhlich & Ciach, 2020). This is because many beneficial species are on the search for dead wood, which is typically removed from urban settings (Seibold et al., 2015). These species include, but are not limited to: cavity nesting birds and mammals, beetles, fungi, other plants and beneficial insects (Fröhlich & Ciach, 2020). Furthermore snags and other decaying wood positively impact soil health, keeping your garden sustainable for years to come (Błońska et al., 2023).

How yard maintenance can help pollinators. Greenpeace, 2023

03 - Use alternatives to pesticides:
Pesticides are chemical compounds that are used to eliminate species considered “pests,” including a variety of insects, rodents, and weeds, and are largely intended to prevent the spread of illness to crops (Pathak et al., 2022). However, pesticides harm the beneficial insects in your garden, and have been scientifically proven to be detrimental to the environment, to wildlife and to human health as well (Meftaul et al., 2020; Sánchez-Bayo, 2012).

Instead of using these harsh chemicals, there are eco-friendly alternatives which have proven just as effective. Above all, it begins by attracting predatory insects and wildlife into your garden, which actively hunt and feed on the harmful pests. This occurs naturally in healthy ecosystems and is known as conservation biological control (Jaworski et al., 2019). Choosing to cultivate companion plants - those that when planted together provide each other benefits - also enhance the settlement and population growth of pests’ natural enemies (Jaworski et al., 2019). The most famous example of this being the “three sisters” - corn, beans, and squash. In some cases, these beneficial predatory insects require assistance. Here, it can be effective to use more DIY-pesticides, such as sea salt spray, water-vinegar mixtures, and coffee grounds, or eco-friendly pesticides, such as biopesticides, horticultural oils and insecticidal soaps (California Lightworks, 2021; Oguh et al., 2019; Aneja et al., 2016; Nile et al., 2019; Souto et al., 2021).

04 - Prioritize native plants & beneficial insects
There are countless beneficial insects for our garden, with the most commonly recognized being those which are considered pollinators (bees, butterflies, spiders, moths, and so on). In addition to pollination, insects can be beneficial to our garden, for a variety of other reasons including for pest control, seed dispersal, and decomposition.

The way to attract these beneficial insects largely depends on which insect you are trying to attract. The Horticulture for Home Gardens' Beneficial Insects Guide highlights over 10 insects common in Canadian gardens, and suggests how to attract them. Likewise, the Toronto and Region Conservation Authority has published a Beneficial Insects Guide, which lists common beneficial insects for healthy yards and their shelter requirements to attract them, at the different stages of life. Generally, it is always best to avoid chemical pesticides, and plant a diverse range of flowers, especially native plant species and herbs (e.g., dill, cilantro, basil, etc.), as the most powerful way of attracting beneficial insects. Other practices such as providing shallow water sources, rocks, and mulching to habit microorganisms have also proven effective (Pacholko, 2021; Toronto and Region Conservation Authority, 2021).


Cicadas are an indicator of a healthy ecosystem. NM Lister, 2022

05 - Harvest rainwater:
Rainwater harvesting is an ancient practice of collecting water runoff from roofs, and saving it for later for irrigation (mainly among other purposes). There are countless benefits associated with this practice. Not only does harvesting stormwater save resources and money, but it also alleviates pressure on local storm drainage systems, and carries micronutrients that promote healthier plants (Capital Regional District, 2012).

To learn how to easily install a rain barrel, the Toronto and Region Conservation Authority has published steps to Help Set Up a Rain Barrel and Harvest Rainwater. Likewise the Capital Regional District of British Columbia has Tips for Rainwater Harvesting, along with a Published Guidelines for Residential Rainwater Harvesting Handbook (Toronto and Region Conservation Authority, 2018; Capital Regional District, 2012).

06 - Incorporate seasonality:
Thinking about seasonality in the garden is crucial to provide year-round habitat - primarily - as well as for aesthetic interest, year-round. Cultivating seasonal interest begins with plant selection, combining annuals, perennials, and evergreen species. For example, selecting plants with bloom in the spring and summer, bright fall colors, and / or berries and textures in the fall and winter, as well as lush evergreens for interim periods. Incorporating overwintering plants is also crucial as they provide shelter and food for small birds and mammals and hibernating insects (Mooney, 2020). For additional information on seasonal gardening, Woodies Garden Goods has a guide for seasonal planting tips with additional considerations, as well as the Toronto Master Gardeners resource for designing a winter garden (Woodies Garden Goods, 2017; Toronto Master Gardeners, n.d.).

Seed and food diversity. Seeds of Diversity Guidebook, n.d.

07 - Save your seeds

Saving the seeds and propagating the plants from your garden is not only cost effective, but also has ecological benefits. For instance, saving seeds plays a crucial role in conservation of varieties and increasing adaptability, and sustainability for food gardening. This is because saving seeds from year to year helps varieties to adapt to the local climate, and allows gardeners to cultivate by selecting fruits or plants to harvest, from those with favorable characteristics (Harper, 2018).

Arguably the greatest benefit of saving seeds to the opportunity to share them with your community. Saving seeds provides a connection to place for a community and develops a working relationship with nature to build a sustainable ecosystem for future generations. The Toronto Green Community Seed Saving Basics resource is a great place to start (Toronto Green Community, 2013) . For information on Canadian seeds from coast to coast, visit Seeds of Diversity, who also have developed a series of reliable resources on all things gardening and seed saving (Seeds of Diversity, 2024).

08 - Source local supplies & local knowledge:

A common roadblock new gardeners face is where to source plants, seeds and their supplies. It is always good practice to source plants locally, and prioritize native plant species. In Ontario, you can begin by navigating the Native Plant Nurseries in Southern Ontario guide, by the Halton Region Master Gardeners (Halton Region Master Gardeners, 2022). For the Greater Toronto Area, EcoMan Jonas Spring with the Toronto Plant Market is the source for a large selection of locally grown native plants (EcoMan Jonas, n.d.). For an extensive list of nurseries for all the Canadian Municipalities, to source native plants and seeds, visit the Canadian Wildlife Federation's Canadian Native Plant Suppliers List (Canadian Wildlife Federation, n.d.).

09 - Organic composting:

Turning our living waste into helpful fertilizer, known as organic composting, supports soil health in gardens, reduces food waste, conserves water and even reduces methane emissions from our landfills (Sharma et al., 2017) Food scraps, coffee grounds, and leaves are all capable of decomposing through either hot or cold backyard composting as long as nitrogen, carbon, air and water are present (Azim et al., 2018). To learn more about the benefits of composting, as well as what can and can't be composted, visit the National Resource Defense Council website (Hu, 2020).

Organic compost bin. Smiling Gardener, n.d.

10 - Get your garden certified

There are many organizations with established programs for garden registration or certification. This process can involve a formal application process, where once certified, gardens receive designations such as 'Wildlife Sanctuary,' 'Wildlife Habitat,' 'Native Plant Habitat,' 'Pollinator Garden,' 'Butterfly Garden,' and others.

There are countless reasons for registering / certifying your garden that can act as a powerful tool for building local support and recognition of your environmental efforts. Above all, this process establishes credibility and validates the ecological benefits associated with the garden through the recognition of larger conversation organizations. Raising awareness through this action helps to modernize landscaping narratives towards biodiversity, and can inspire passers-by to engage in similar eco-friendly practices. Receiving formal certification by organization can also provide you and your garden with incentives and resources. For example, there are programs which provide gardeners with local resources, input from experts, and upon certification, eye-catching garden signs. Likely the most well recognized is the Canadian Wildlife Federation Garden Habitat Certification program. Similar programs include: In the Zone through Carolinian Canada, the North American Butterfly Association's Butterfly Garden certification, the Monarch Butterfly Fund's Monarch Waystation Program, and the National Wildlife Federation Certified Wildlife Habitat program.

BONUS TIP: The Ecological Design Lab has developed FREE ecologically-informed garden signs available for download! These garden signs are an effective tool for educating your community about your environmental efforts. Garden signs inspire action, and provide a sense of empowerment for gardeners and visitors alike, to actively participate in environmental practices. Whether you're promoting a garden for pollinators, a naturalized yard, or anything in between, we have provided a range of options to suit your needs and budget.

EDL ecologically-informed signage. NM Lister, 2024

PART 2: WHAT PLANTS SHOULD I CHOOSE? (PLANT GUIDE / TOP PLANT PICKS)

Together our organization has compiled a list of our favorite garden plants for you to consider. These plants listed are suggestions and represent a selection of native and regionally appropriate species across Canada, and for Ontario specifically. While these plants can be appreciated for their beauty, ecological benefits or other characteristics, please remember to evaluate them based on your garden goals as well as your environment and site conditions. **Remember it is always best to seek local knowledge to determine if these plants will thrive in your space.**

The subsequent section provides a spreadsheet of detailed information about each recommended plant, including their growing requirements, and some highlight ecological characteristics.

Across Canada:

Trees

- Red Maple (Acer rubrum)
- White Birch (Betula papyrifera)
- Maidenhair tree (Ginkgo biloba)
- Balsam Fir (Abies balsamea)
- American Mountain Ash (Sorbus americana)

Shrubs

- Saskatoon Berry (Amelanchier alnifolia)
- Alpine Currant (Ribes alpinum)
- Wild Rose (Rosa carolina)
- Canada Buffaloberry (Shepherdia canadensis)
- Red Osier Dogwood (Cornus sericea)

Perennials & Vines

- Wild Bergamot (Monarda fistulosa)
- Goldenrod (Solidago spp.)
- Canada Anemone (Anemone canadensis)
- Swamp Milkweed (Asclepias incarnata)
- Clematis virginiana (Virginia Clematis)
- Canada Violet (Viola canadensis)
- Switchgrass (Panicum virgatum)

Ontario:

Trees

- White Pine (Pinus strobus)
- Sugar Maple (Acer saccharum)
- Black Cherry (Prunus serotina)
- Red Oak (Quercus rubra)
- Eastern Redbud (Cercis canadensis)

Shrubs

- Nannyberry (Viburnum lentago)
- Alternate-Leaf Dogwood (Cornus alternifolia)
- Northern Spicebush (Lindera benzoin)
- Serviceberry (Amelanchier canadensis)
- Fragrant Sumac (Rhus aromatica)

Perennials & Vines

- Wild Columbine (Aquilegia canadensis)
- Common Milkweed (Asclepias syriaca)
- Purple Coneflower (Echinacea purpurea)
- Large-leaved Aster (Eurybia macrophylla)
- Virginia Creeper (Parthenocissus quinquefolia)
- Boneset (Eupatorium perfoliatum)

ADDITIONAL RESOURCES:

- Nature Canada: Recipe for a garden full of birds, butterflies and bees through native plants
- Nature Canada: Native Flora You can Plant to Help Birds
- Nature Canada: Add Some Bird Friendly Plants to your Garden!
- NCAT: Sustainable Pest and Weed Control Database
- SNAP: Organic Land Care Training for Municipal Officials or Transitioning Landscapers
- Washington Post: 5 reasons to keep some dead wood in your garden

ACROSS CANADA:

Plant Name	Type	Soil	Mature Height	Mature Spread	Cold Hardiness (USDA Zone)	Exposure	Water Use	Season of Interest	Ecological Benefits
Red Maple (Acer rubrum)	Tree	Moist, acidic	40-60 ft (12.2-18.3 m)	25-35 ft (7.6-10.7 m)	3-9	Full sun to partial shade	Medium	Fall	Habitat and food (i.e., seeds, leaves) for wildlife, including birds (i.e., Downy Woodpeckers, American Redstarts), and insects (i.e., moths and caterpillars).
White Birch (Betula papyrifera)	Tree	Well-drained, sandy	30-50 ft (9.1-15.2 m)	20-30 ft (6.1-9.1 m)	2-7	Full sun	Medium	All seasons	Habitat for wildlife, including birds (i.e., Chickadees, Woodpeckers) and insects (i.e., moths, butterflies); bark used for shelter by smaller mammals.
Maidenhair tree (Ginkgo biloba)	Tree	Loamy, well-drained	50-80 ft (15.2-24.4 m)	30-40 ft (9.1-12.2 m)	3-8	Full sun	Low	Fall	Supports pollinators; resilient to urban environment stressors; resistant to pests and diseases.
Balsam Fir (Abies balsamea)	Tree	Well-drained, acidic	40-60 ft (12.2-18.3 m)	20-25 ft (6.1-7.6 m)	3-5	Full sun to partial shade	Medium	All seasons - evergreen	Habitat for wildlife including birds (i.e., chickadees, crossbills), and small mammals (i.e., snowshoe hares); resin attracts beneficial species of insects
American Mountain Ash (Sorbus americana)	Tree	Well-drained, acidic	20-30 ft (6-9 m)	10-20 ft (3-6 m)	2-6	Full sun to partial shade	Medium	Fall	Habitat and food (i.e., berries) for wildlife including birds (i.e., Blue Jays, American Robins).
Saskatoon Berry (Amelanchier alnifolia)	Shrub	Well-drained, sandy	10-15 ft (3.0-4.6 m)	6-10 ft (1.8-3.0 m)	2-6	Full sun	Low	Spring	Habitat and food (i.e., berries, leaves, flowers, and buds) for wildlife; including birds (i.e., woodpeckers, chickadee), mammals (i.e., chipmunks, marmots) and pollinators; excellent for erosion control.
Alpine Currant (Ribes alpinum)	Shrub	Moist, well-drained	3-6 ft (0.9-1.8 m)	3-5 ft (0.9-1.5 m)	2-7	Partial shade	Low	Spring	Habitat for birds and small mammals; serves as a natural hedge or screen.
Wild Rose (Rosa carolina)	Shrub	Sandy, well-drained	4-6 ft (1.2-1.8 m)	4-6 ft (1.2-1.8 m)	4-9	Full sun	Low	Summer	Habitat and food (i.e., rose hips, leaves, buds, twigs) for wildlife, including birds (i.e., Fox Sparrows, Northern Mockingbirds), and pollinators.
Canada Buffaloberry (Shepherdia canadensis)	Shrub	Sandy, rocky	3-6 ft (0.9-1.8 m)	3-6 ft (0.9-1.8 m)	2-6	Full sun to partial shade	Low	Summer	Habitat and food (i.e., berries) for wildlife, including birds (i.e., grouse, songbirds) and smaller mammals (i.e., chipmunks, hares); crucial for nitrogen fixation.
Red Osier Dogwood (Cornus sericea)	Shrub	Moist, clay	6-10 ft (1.8-3.0 m)	6-10 ft (1.8-3.0 m)	2-8	Full sun to partial shade	Medium	Winter	Habitat and food (i.e., berries, nectar, stems) for wildlife, including birds (i.e., American Robins, Bluebirds) and pollinators.
Wild Bergamot (Monarda fistulosa)	Perennial	Dry to moist	2-4 ft (0.6-1.2 m)	1-3 ft (0.3-0.9 m)	3-8	Full sun	Low	Summer	Habitat and food (i.e., flower) for wildlife including pollinators; provides as a larval host for some moths.
Goldenrod (Solidago spp.)	Perennial	Dry to moist	2-6 ft (0.6-1.8 m)	1-3 ft (0.3-0.9 m)	3-9	Full sun	Low	Fall	Food (i.e., nectar, seeds) for wildlife, including birds (i.e., American Goldfinch, Dark-Eyed Junco), and pollinators.
Canada Anemone (Anemone canadensis)	Perennial	Moist, loamy	1-3 ft (0.3-0.9 m)	2-3 ft (0.6-0.9 m)	3-7	Partial shade	Medium	Summer	Habitat and food (i.e., nectar) for wildlife, including pollinators; erosion control and ground cover.
Swamp Milkweed (Asclepias incarnata)	Perennial	Wet, loamy	3-5 ft (0.9-1.5 m)	2-3 ft (0.6-0.9 m)	3-9	Full sun	High	Summer	Habitat and food (i.e., nectar, leaves) for wildlife, especially pollinators; vital host plant for monarch butterfly larvae.
Clematis virginiana (Virginia Clematis)	Vine	Moist, well-drained	10-20 ft (3.0-6.1 m)	10-15 ft (3.0-4.6 m)	4-9	Partial shade	Medium	Summer	Habitat and food (i.e., nectar, leaves) for wildlife, including pollinators; serves as a host plant for fritillary butterfly species; ground cover.
Canada Violet (Viola canadensis)	Perennial	Moist, well-drained	8-16 inches (20-40 cm)	8-16 inches (20-40 cm)	3-7	Partial shade to full shade	Medium	Spring to early summer	Habitat and food (i.e., nectar) for wildlife, including pollinators; serves as a host plant for fritillary butterfly species; ground cover.
Switchgrass (Panicum virgatum)	Perennial	well-drained sandy, loamy, or clay soils	3-6 ft (0.9-1.8 m)	2-3 ft (0.6-0.9 m)	3-9	Full sun	Medium	Late summer, early fall	Habitat and food (i.e., leaves) for wildlife, including birds (i.e., grouse, quail), small mammals (i.e., rabbits), and pollinators; erosion control.

ACROSS ONTARIO:

Plant Name	Type	Soil	Mature Height	Mature Spread	Cold Hardiness (USDA Zone)	Exposure	Water Use	Season of Interest	Ecological Benefits
White Pine (Pinus strobus)	Tree	Sandy, well-drained	50-80 ft (15.2-24.4 m)	20-40 ft (6.1-12.2 m)	3-8	Full sun to partial shade	Medium	All seasons	Habitat and food (i.e., seeds) for wildlife, including birds (i.e., mourning doves, pine warblers), and insects (i.e., larvae); windbreaks.
Sugar Maple (Acer saccharum)	Tree	Moist, well-drained	50-70 ft (15.2-21.3 m)	30-50 ft (9.1-15.2 m)	3-8	Full sun to partial shade	Medium	Fall	Habitat and food (i.e., sap and seeds) for wildlife, including birds (i.e., woodpeckers, warblers) and pollinators.
Black Cherry (Prunus serotina)	Tree	Well-drained	50-60 ft (15.2-18.3 m)	30-40 ft (9.1-12.2 m)	3-9	Full sun	Low	Spring to Fall	Habitat and food (i.e., fruit) for wildlife, including birds (i.e., bluebirds, sparrows), mammals (i.e., chipmunks, squirrels), and pollinators.
Red Oak (Quercus rubra)	Tree	Loamy, well-drained	60-75 ft (18.3-22.9 m)	40-50 ft (12.2-15.2 m)	3-8	Full sun	Medium	Fall	Habitat and food (i.e., acorn, leaves, stem) for wildlife, including birds (i.e., blue jays, woodpeckers), and pollinators.
Eastern Redbud (Cercis canadensis)	Tree	Loamy, well-drained	20-30 ft (6.1-9.1 m)	25-35 ft (7.6-10.7 m)	4-9	Partial shade	Medium	Spring	Habitat and food (i.e., flowers, buds, young seed pods) for wildlife, including various pollinators (i.e., hummingbirds).
Nannyberry (Viburnum lentago)	Shrub	Moist, well-drained	10-15 ft (3.0-4.6 m)	6-12 ft (1.8-3.7 m)	2-8	Full sun to partial shade	Medium	Fall	Habitat and food (i.e., seeds) for pollinators; hosts Spring Azure butterfly's larvae and caterpillars.
Alternate-Leaf Dogwood (Cornus alternifolia)	Shrub	Moist, well-drained	8-12 ft (2.4-3.7 m)	6-8 ft (1.8-2.4 m)	3-7	Partial shade	Medium	Spring	Habitat and food (i.e., berries, leaves) for wildlife, including birds (i.e., Northern Cardinals, Juncos) and pollinators.
Northern Spicebush (Lindera benzoin)	Shrub	Moist, sandy	6-10 ft (1.8-3.0 m)	4-6 ft (1.2-1.8 m)	5-9	Partial shade	Low	Fall	Habitat and food (i.e., berries, leaves) for wildlife, including birds (i.e., White-Throated Sparrows, American Robins) and other pollinators (i.e., Swallowtail Butterfly's caterpillars, Tulip Tree Beauty Butterfly caterpillars).
Serviceberry (Amelanchier canadensis)	Shrub	Moist, sandy	15-20 ft (4.6-6.1 m)	10-15 ft (3.0-4.6 m)	4-9	Full sun	Medium	Spring	Habitat and food (i.e., berries, nectar) for wildlife, including birds (i.e., American Robins, Northern Cardinals), and other pollinators (i.e., Viceroy and Red-Spotted Purple butterflies).
Fragrant Sumac (Rhus aromatica)	Shrub	Dry to moist	2-6 ft (0.6-1.8 m)	6-10 ft (1.8-3.0 m)	3-9	Full sun to partial shade	Low	Fall	Habitat and food (i.e., berries, stems, flowers, leaves) for wildlife, including birds (i.e., American Robins), as well as smaller mammals; erosion control.
Wild Columbine (Aquilegia canadensis)	Perennial	Rocky, well-drained	1-3 ft (0.3-0.9 m)	1-2 ft (0.3-0.6 m)	3-8	Full sun	Low	Spring	Habitat and food (i.e., nectar and leaves) for pollinators (i.e., Ruby-Throated Hummingbird, Black Swallowtail Butterfly, Sweat Bees, Bumblebees, Hawk Moths).
Common Milkweed (Asclepias syriaca)	Perennial	Dry, sandy	3-5 ft (0.9-1.5 m)	2-3 ft (0.6-0.9 m)	3-9	Full sun	Low	Summer	Habitat and food (i.e., nectar) for wildlife including a variety of pollinators (i.e., Monarch Butterfly, Milkweed Bugs, Milkweed Leaf Beetles).
Purple Coneflower (Echinacea purpurea)	Perennial	Loamy, well-drained	2-4 ft (0.6-1.2 m)	1-2 ft (0.3-0.6 m)	4-9	Full sun	Medium	Summer	Habitat and food (i.e., nectar, leaves, seeds) for wildlife, including birds (i.e., hummingbirds, goldfinches, sparrows), and other pollinators.
Large-leaved Aster (Eurybia macrophylla)	Perennial	Moist, loamy	1-2 ft (0.3-0.6 m)	1-2 ft (0.3-0.6 m)	3-8	Partial shade	Medium	Fall	Habitat and food (i.e., seeds, leaves) for wildlife, including pollinators (i.e., Pearl Crescent butterflies, Silvery Checkerspot butterflies, moths and bees); provides ground cover; overwintering pollinators.
Virginia Creeper (Parthenocissus quinquefolia)	Vine	Well-drained, loamy	30-50 ft (9-15 m)	5-10 ft (1.5-3 m)	3-9	Full sun to partial shade	Medium	Fall to year-round	Habitat and food (i.e., berries, leaves, stem) for wildlife, including birds (i.e., chickadees, nuthatches, mockingbirds), small mammals (i.e., squirrels, skunks), and other pollinators.
Boneset (Eupatorium perfoliatum)	Perennial	Wet, loamy	3-5 ft (0.9-1.5 m)	2-4 ft (0.6-1.2 m)	3-8	Full sun to partial shade	High	Late summer to early fall	Provides habitat and food (i.e., nectar, leaves, seeds) for wildlife, including pollinators (i.e., bees, butterflies, moths, beetles); acts as a host plant for many moth species (i.e., Burdock Borer Moth); provides seeds for birds in late fall.

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