MIDDLE PHOTO: TYSON HARRISON

Pollinator and Allergy-Friendly Gardening in the City of Victoria

Gardening in the City helps create healthy, resilient, and diverse ecosystems while building community and our food security.

Plants that produce pollen are highly beneficial to wildlife, and particularly to pollinating insects. About 1/3 of the food we eat has been produced from the work of pollinators. Pollinators are essential components of healthy and diverse ecosystems, and are a key component of a sustainable, resilient, and biodiverse urban environment.

Pollen can also trigger allergic reactions. Respiratory allergies such as allergic rhinitis affect 1 in 5 Canadians and approximately 30–35% of people living in British Columbia are affected by pollen allergies. For people who experience allergies, exposure to certain plants can result in discomfort and at times, serious health problems. Adopting lower allergen gardening techniques may allow residents susceptible to pollen allergies and other related conditions more opportunity to enjoy the outdoor environment.

This guide offers tips and suggestions for gardening with both pollinators and allergy-friendly plants in mind.

This demonstration apiary was built in Victoria by Pollinator Partnership Canada and the Emily Carr Institute of Design. It provides information on the importance of local pollinator groups.

1. Tips to support pollinators

Small actions can make a large difference for pollinators. Here are a few tips to support pollinators in your yard or community.

1.1 Garden with plants that are pollinator friendly and native to your eco-region (See 'East Vancouver Island Eco-Regional Guide and Susuki's Queen of Green in Resources).

1.2 Many non-native plants are good for pollinators, but make sure these plants are not invasive. (See Grow Me Instead, Top 26 Most Invasive Plants in B.C., in Resources).

1.3 To provide a consistent supply of pollen and nectar, select different plants that together will bloom over the entire growing season. (See HATS, Gardening with Native Plants in Resources)

1.4 Do not use pesticides or plants treated with pesticides. Many pesticides are toxic to pollinating insects.

1.5 Leave areas of your yard with leaves, sticks and rotting wood that all provide pollinator habitat. However, be aware that this can create mold and potentially cause allergic reactions for some (see David Suzuki's Queen of Green.ca in Resources).

FOR MORE INFORMATION:

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CITY OF VICTORIA

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2. Tips to reduce allergenic pollen exposure

These lower allergen gardening tips will help new and experienced gardeners reduce air-borne pollen exposure for people with pollen allergies and related allergic symptoms. A good method for choosing plants that are appropriate for our region and lower pollen allergy, would be to avoid plants that have a high allergy rating (see Ogren's OPALS Rating System below) and to choose native plants to our region that are primarily insect pollinated (See 'East Vancouver Island Ecoregional Guide' in Resources).

TOP 10 Lower Allergen and Pollinator Friendly Plants

There are many local plants that could be considered for a lower allergen landscape. A few examples of this are: Camas, Kinnikinnick, Yarrow, Sword Fern and Coastal Strawberry.

Here are the City of Victoria's 'top 10' excellent plants that consider both lower allergen (via OPALS rating) as well as being strong supporter of pollinators. This is just a small selection, as there are many lower allergen plants that are also considered to be pollinator friendly.

Arctostaphylos uva ursi
(Kinnikinnick) – native
OPALS – 2

Pieris *japonica*
(Lily of the Valley)
OPALS – 3

A*chillea millefolium*
(Yarrow) – native
OPALS – 4

Sedum spp.
(Stonecrop) – native sp. Avail
OPALS – 2

Mahonia aquifolium
(Tall Oregon Grape) – native
OPALS – 2

Ceanothus thyrsiflorus
(California Lilac)
OPALS – 4

Hebe spp.
(Shrubby Veronica)
OPALS – 2

Allium spp.
(Flowering Onion) – native species Avail.
OPALS – 2

Vaccinium ovatum
(Evergreen Huckleberry) – native
OPALS – 2

Oxalis oregana
(Wood Sorrel) – native
OPALS – 1

Please refer to our Lower Allergen Landscape Planting Resource List as a resource to keep in mind when creating an accessible, lower allergen garden.

Plant Allergy Rating Scale:

In Thomas Ogren's book, *The Allergy Fighting Garden: Stop Asthma and Allergies with Smart Landscaping* (see in Resources), a rating systems is used to describe and rate a plant's propensity to cause allergic reactions.

Ogren establishes plant allergenicity by considering various characteristics, such as pollen dispersal method (wind versus insect) and stickiness. Choosing plants with a lower OPALS rating (5 or less) may help reduce pollen-related allergies.

Table 1: Ogren Plant Allergy Scale (OPALS) Rating System

OPALS Rating	Guideline
1 – 5	Lower potential to cause allergic reactions, increased risk as number rises.
6 – 8	High potential to cause allergic reactions
9 – 10	Extremely high potential to cause allergic reactions

The OPALS ranking system has been used here and in the Lower Allergen Landscape Planting Resource List as the primary tool in the assessment of the allergenicity of plant species. Currently, it is the only numerically valued system to rate allergenicity and is not all inclusive of lower allergen plant species available for use in our region. Research and understanding of pollen dispersal methods and other allergy inducing attributes of plants is important in making informed decisions.

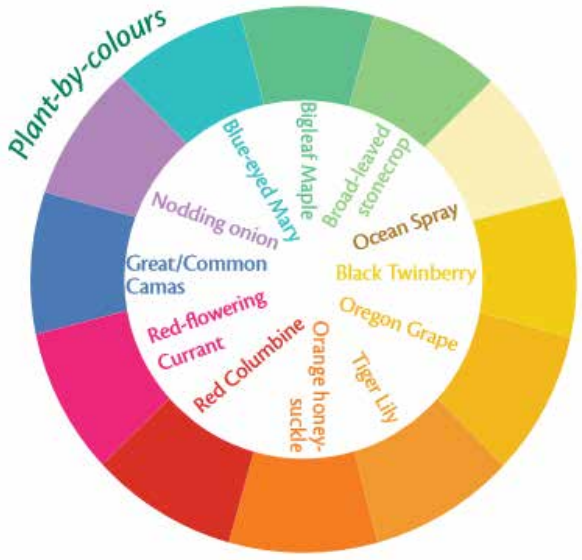
2.1 Plant Selection:

(a) Non-Invasive and no plants treated with pesticides:
See section 1.2 and 1.4 for resources.

(b) Avoid planting wind-pollinated plants:
Allergenic plants tend to be wind-pollinated (*anemophilous*) and produce large amounts of pollen. Examples of wind-pollinated plants include poplar trees, as well as many weeds, such as ragweed and stinging nettles.

(c) Select insect-pollinated flowering plants:
Insect-pollinated plants (*entomophilous*) generally produce lower quantities of pollen, which tends to be stickier and heavier pollen than from airborne wind-pollinated plants. Consult the 'Lower Allergen Landscape Planting Resource List' in Resources.

(d) Select dioecious female + insect-pollinated monoecious species:
As it is the male sex organ that creates the pollen, it is possible to reduce air born pollen further by selecting dioecious female species (although options for this can be limited) or monoecious species that are insect or animal pollinated (less airborne pollen). See 'primary classifications of flowering plants' definitions in FAQs). For examples, consult the article 'Landscape Plant Selection Criteria for the Allergic Patient' listed under Resources.



Habitat Acquisition Trust' 'Plant by Colours' wheel showcases native plant options based on their colour scheme that attract various pollinators.

(e) Plant by Colours:
Various pollinators are attracted to different colour hues and scents. For example, bees tend to prefer bright white, yellow or blue flowers while hummingbirds are attracted to plants with reds, oranges and whites (See 'Pollinators Protection and Stewardship' in Resources). Select plants that attract or detract certain types of pollinators and cross-reference with the 'Lower Allergen Plant Resource List' for a lower allergen landscape.

2.2 General Strategies for Lower-Allergen Gardening

(a) Sourcing:
Inquire and encourage local nurseries to stock lower allergen plants (and ask to have them properly labeled).

(b) Plant Placement:

- Pollen levels are highest near the plant. Place allergenic plants away from high traffic areas, such as doors, pathways and patios, play features, or air intakes and opening windows.
- To best consider those who experience pollen-related allergies, find a location that will help avoid pollen exposure. For example, a lower allergen hedge or fence on the windward side of a garden can help trap airborne pollen. Higher pollen plants are best in naturalized areas and way from places people congregate.
- Hard surfaces can keep pollen airborne. Lawns, rain gardens, and swales can help trap fallen pollen while providing pollinator habitat.

(c) Garden Maintenance:

- Be mindful that disturbing settled pollen (e.g., mowing grass) can result in the pollen becoming airborne and trigger allergic reactions. Keep grass cut low to reduce the production of pollen. Mow when the grass is wet.
- Monitor outdoor allergen levels to know when the most prominent pollen and spore types in Victoria are active (see 'Aerobiology Research Laboratories' in Resources) and to consider the timing of plant pruning to best avoid highest levels of pollen release.
- When possible, avoid gardening when it is windy or when the garden is dry, as disturbed pollen will travel further under these conditions. Cool, wet days also help keep pollen levels low.
- Pollen counts often peak around noon in urban areas, but it also depends on time of year and types of plants growing in the area. Temperature, wind, humidity and rain can also affect the pollen count.

(d) Trees:
Trees can be one of the largest producers of pollen. If you live near a school or have tenants or neighbours with allergies, consider removing high pollen-producing male trees and nut trees from your selection process, and research lower allergen options. See 'tree selection' options in Ogren's book under 'Pollen Reduced Gardening' section of Resources.

3. Stinging Insects:

Many low pollen plants are large, bright coloured flowering plants that are insect pollinated (entomophilous plants) will attract insect pollinators, such as bees and wasps. Some stinging insects can be harmful to a small percentage of people who have insect venom allergies, with stings resulting in serious or life-threatening consequences.

(a) Generally, insects such as native bees are not aggressive and only sting in self-defense if you pinch or step on them, or if they get caught in clothing.

(b) Honeybees are only in managed hives in our region, not in wild nests. Therefore, they can be defensive of their hives, so it is best practice to stay back. They are easily recognizable in their managed boxes.

(c) Bumble bee nests can be identified by frequent workers entering or exiting the hole to the nest. They can be in trees, the ground, compost piles etc. Bumble bees do not swarm. They tend to not demonstrate aggression if observers stay back at least one metre.

3.1 Stinging Insect Considerations:

Consider plant placement (as listed in Section 2.3) as well as the following maintenance and planting tips:

(a) Consider placement and selection of flowering plants known to attract stinging insects away from, and not directly adjacent to, playgrounds, pathways, patios, walkways and public areas of congregation.

(b) Be mindful to not leave food or spills (particularly meats or sugary drinks) in outdoor spaces, particularly public spaces, as to avoid attracting stinging wasps.

(c) Around your home, keep trees and shrubs thinned out and cut back from the structure, and seal up exterior holes and cracks where problematic insects might create nests.

(d) If you are worried about nests and have a family member with an anaphylactic allergy to a certain species of stinging insect that nests in burrows, fill in any rodent holes or mole tunnels, or other void spaces such as hollow logs or gaps in stone faces in the yard so insects cannot build nests in them. Also, be mindful of wasps' nests under sheds, in crawl spaces, in chimneys, etc.

(e) Be careful when mowing the lawn or trimming vegetation, activities that might arouse nesting bumble bees or wasp nests.

Nepeta racemosa is an excellent example of a plant species that is ranked OPAL 2 but can be associated with being extremely pollinator friendly with a propensity to attract bees.



From left to right: A leaf-cutting bee, a bumble bee and a mason bee. Photos by Tyson Harrison.

Frequently Asked Questions

What are pollinators?

Pollinators are insects or animals that move pollen. Bees are thought to be the most important pollinators globally. Pollinators also include butterflies, moths, beetles, flies, wasps, and birds. Globally, there are over 20,000 species of bees and over 450 diverse and beautiful types of native bees that call British Colombia home.

How is pollen dispersed?

Different species distribute pollen in different ways, with the main dispersal methods being:

- Anemophilous (an-*uh*-mof-*uh*-l*uh* s) – by wind;
- Entomophilous (en-t*uh*-mof-*uh*-l*uh* s) – by insect. Insects typically pollinate flowers as they move from flower to flower or plant to plant searching for nectar and pollen to feed themselves or their young. When an insect lands on a flower to feed, pollen grains stick to its body accidentally or are collected into specialized structures as is the case for bees. As the insect moves to another flower of the same species, pollen grains are transferred to the flower's stigma and pollination occurs.

The way in which a plant reproduces affects pollen characteristics and how it moves in the environment. To best understand this, it is important to note that there are three primary classifications of flowering plants.

- Dioecious (dahy-ee-sh*uh* s) – means that the male and female reproductive organs are in separate plants. Female plants would have flowers consisting of its reproductive organ, the pistil, and the male plants would have flowers consisting of its reproductive organ, the stamen.
- Monoecious (*muh-nee-shuh* s) – means that the plant has both male and female reproductive organs in separate flowers but on the same plant.
- Perfect Flowered – means a plant has both male and female reproductive organs on the same flower.

Many dioecious plants are wind pollinated yet some need pollinators. Perfect flowers and/or monoecious can also be obligate out-crossers or self-fertile (or anything in between). The important distinction is if they have evolved to attract pollinators to distribute their pollen – either within the flower, within the plant, or among plants. If the plant has evolved for pollinators, they put resources into things like showy flowers, scent, and often bigger (non-wind borne) and much fewer pollen grains than wind pollinated.

How does pollen cause allergic reactions?

Pollen allergies, also called seasonal allergies and hay fever are referred to by the medical term "allergic rhinitis" and are often caused by exposure to pollen. Pollen enters the human body and is experienced as a hostile foreign substance by people with certain immune system conditions like allergies and asthma. Proteins in pollen cause the immune system to produce histamines, which causes the noses, eyes, throat and sinuses to become swollen, irritated, and inflamed. This leads to visible symptoms such as trouble breathing, sneezing, a runny nose, itchy red eyes and a sore throat or coughing. It may also worsen other conditions; for example, it may trigger acute asthma attacks and lead to whole-body (anaphylaxis) allergic reactions, however this is a rare occurrence for pollen exposure.

Are pollen allergies seasonal?

Highest pollen concentrations and airborne levels are usually reported during the spring (trees), summer (weeds and grasses), and the fall (weeds, non-native, nuisance plants). The lowest pollen concentrations are typically observed in winter. However, given Victoria's mild climate, pollen reactions can be experienced throughout the year. (For the up-to-date daily allergy outlook for Victoria, see the 'Weather Network' in Resources).

Does climate change impact pollen allergies?

Some research suggests that climate change will increase airborne allergens and related allergic reactions. This is because warmer weather and milder winters can result in increased pollen production in plants. Higher carbon dioxide levels can also increase plant growth and pollen production, and more frequent thunderstorms can increase the amount of pollen in the air. All these facts could result in higher airborne pollen levels, longer allergy seasons, and greater exposure to aeroallergens. Thus, it is important when choosing replacements for plants not thriving due to climate change, to consider native, lower allergen species in the selection process.

Resources

Living with Pollen Allergies

Health Link BC: The BC government offers information and resources to prevent and treat pollen-related allergic reactions.

Visit www.healthlinkbc.ca/health-topics/tv6577

Outdoor allergen levels

Aerobiology Research Laboratories monitor outdoor allergen levels and use this information to produce reports and forecasts for media, allergists, research institutions, and pharmaceutical researchers. Visit http://www.pollenexperts.ca/victoria-british-columbia/

The Weather Network offers a daily allergy outlook for Victoria. See https://www.theweathernetwork.com/ca/forecasts/pollen/british-columbia/victoria

Pollen Reduced Gardening

Article: Brett J. Green, Estelle Levetin, W. Elliott Horner, Rosa Codina, Charles S. Barnes, Warren V. Filley, "Landscape Plant Selection Criteria for the Allergic Patient", The Journal of Allergy and Clinical Immunology: In Practice, Volume 6, Issue 6, 2018, Pages 1869-1876, ISSN 2213-2198, https://www.jaci-inpractice.org/article/S2213-2198(18)30342-8/pdf.

Book: "The Allergy Fighting Garden: Stop Asthma and Allergies with Smart Landscaping" by Thomas Leo Ogren, was published in 2015 by Penguin Random House. This book (available in print and e-book format) offers more up-to-date information and OPALS rating.

Book: "Veterans Gardening Guide: Promoting Allergy-Friendly Planting" by Peter Prakke.

Website: Society for Allergy Friendly Environmental Gardening: http://www.safegardening.org/

Resource: City of Victoria Lower Allergen Landscape Planting Resource List

Minimizing Pesticide Use

To help reduce reliance on chemical pesticides, the City of Victoria has adopted the Pesticide Use Reduction Bylaw. The City's website can help you learn about how you can prevent garden pests without pesticides. www.victoria.ca/pesticide_reduction.

Avoiding Invasive Species

Invasive Species Council of BC:

Offers resources to reduce the spread and impacts of non-native species within BC. www.bcinvasives.ca.

Native Plant Resource

East Vancouver Island Ecoregional Guide: Offers plant selection to support pollinators.

http://vichortsociety.org/wp-content/uploads/2013/10/Ecoregional-guide-SHORT-E-Van-Isle-194.pdf

Pollinator Support Resources

Habitat Acquisition Trust, Pollinators protection and stewardship resource.

hat.bc.ca/images/Pollinator-Guide-Web.pdf

Island Pollinator Initiative

A coalition of groups working together to protect pollinators on Vancouver Island and the Gulf Islands. Key initiatives include providing community resources and education on pollinators and conservation. www.islandpollinatorinitiative.ca.

Pollinator Partnership Canada

An organization that promotes the health of pollinators through conservation, education, and research. Key initiatives include Eco-regional Planting Guides, School Pollinator Lesson and Garden Kits, Citizen Science, community and professional education, the North American Pollinator Protection Campaign, and National Pollinator Week.

www.pollinator.org/canada.

Growing in the City

To create healthy and diverse ecosystems while building communities and our food security, the City of Victoria supports community gardening, small-scale commercial urban food production, food trees on City land, and boulevard gardening. For more information on applicable City programs, visit www.victoria.ca/growinginthecity.