



# **How to Make a Pollinator Garden**



**by Clement F. Kent**



Pond edge at University of Toronto, Mississauga. Moist soil supports rose Swamp milkweed, pink Beebalm, and Blue Vervain.



Great Blue Lobelia (left) and waterlily (right) are two more natives for pond margins or centers.



# Introduction

A pollinator garden is a place where birds, bees, butterflies and other pollinators can find food, drink, and a home. I use native plants in my pollinator gardens to create beautiful places that have a natural feel and help the environment.

In this booklet I'll tell you how to make a pollinator garden. To get there is a bit like solving a mystery: we'll have to be detectives answering questions about why, what, who, when, and where (the five w's) so we can get to "how". Let's look at these five "w" questions that lead us to the big "How?".

**Why** should we make pollinator gardens?

**What** do pollinators need in gardens?

**Who** will enjoy the garden?

**When** will they be in the garden?

**Where** will the garden be?



*Monarchs migrating in fall – author's pollinator garden, shore of Lake Huron*

When we can answer these five questions we'll know what kind of pollinator garden we're going to design. After that, the rest of the booklet will take you through the steps of designing, planting, maintaining, and enjoying a pollinator garden.

## **Why** should we make pollinator gardens?

Why should we be interested in pollinator gardens? To answer this we need to know why plants need pollinators, why people need pollinators, why pollinators are declining, and the benefits your pollinator garden will bring.

## ***Why plants need pollinators – it's all about SEX***



*green sweat bees on Blue Vervain (Verbena hastata)*

Yes, this is all about the birds and the bees...plants have sex too. To make seeds (babies), plants need to bring together pollen (sperm) and ovules (eggs). Plants, like people, make healthier offspring if they're not inbred.

For people, that's simple: don't marry your close relations. Plants have a harder time: they're rooted (literally!) in one

spot and have to get pollen from another plant. Many flowering plants need help to get pollen from one mate to another.

That's where the birds and the bees come in...and the butterflies, moths, beetles, bats, flies, ants, and other creatures that can be pollinators. If there are too few pollinators, these plants set fewer seeds or fruits or become more inbred.

## ***Why we need pollinator gardens – F,A,R,M***

**F** stands for fun, first in our list - pollinators in your garden are not to be missed.

**A**griculture's second - food, you know? - fruits, forage, and veggies need bees to grow.

**R**enewal of nature is third but not last – if ecosystems go our time will be past.

**M**aking a difference, the fourth part of FARM - you have fun by reducing harm.

## ***Why pollinators are declining.***

Pesticides and diseases have knocked down honeybees and bumblebees in the last two decades. Equally hard on many species is habitat loss due to modern agricultural styles and (sub)-urban sprawl. Finally, climate change is driving some pollinators extinct at the edges of their ranges.



## ***Why pollinator gardens are great!***

Researchers have found that gardens planted with an abundance of flowers blooming over a long period can bring pollinator numbers up in areas that had been losing them... and adding nesting sites and changing garden care practices have a big impact too.

You can make a pollinator garden that will be fun to be in, educational, that will bring in lovely birds, butterflies, and bees you never knew were in your neighborhood, and help them survive and thrive.

## ***What do pollinators need in gardens?***

Food, drink, and a good home is the quick answer. Let's look at what each of these means.

### ***Food – nectar, pollen, bugs, leaves***

I bet you guessed that nectar and pollen were on the menu!

Nectar is rich in many sugars and gives energy to all pollinators. Nectar's mix of kinds of sugars can make it easier to digest than sugar water in feeders, which is all sucrose. Think of sports drinks which often have fructose and glucose and you'll understand why nectar is better.



*monarch caterpillars on milkweed*

Pollen is rich in proteins and fats. Bee babies (larvae) need pollen to grow. Bee colonies don't grow without pollen.

But who eats bugs and leaves? Bird babies (chicks) absolutely require insects and other critters – so orioles and hummingbirds need a place rich in bugs to raise a family. Butterfly babies (caterpillars) eat leaves, usually of just a few kinds of plants per type of butterfly.

So, a well-rounded pollinator garden restaurant needs a continuous supply of nectar to power the parents, plus pollen, bugs, and leaves in the "children's menu".

## ***Drink – water in the garden***



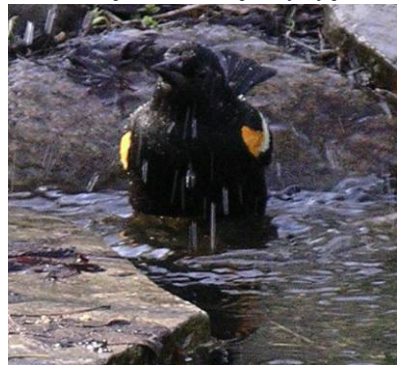
*honeybees in the California desert drinking from a stream in a palm oasis*

Some pollinators can get all the water they need from nectar, but many need a source of clean drinking water too. In dry places, some honeybee foragers specialize in bringing water back to the hive where it also serves for evaporative air conditioning on hot summer days.

Water in your garden brings in many other wild things, not just pollinators, and is a constant source of delight.

### ***Good home = good site + building supplies.***

Location, location, location! Birds need dense shrubs or trees off the beaten track for their nests. But supplies are important too. One spring morning I watched an oriole pull strips of fiber from old stems in the garden to use in weaving its elaborate hanging nest.



*Redwing blackbird bathing in my city garden*

Bees nest too – some underground, some in stems or rotten wood. Some gather pine resin or leaves for nest building. Bumblebees like abandoned mouse nests for the insulation the furry nest gives their young, who need to be warm. We'll design our garden to include good sites and materials, and just as important we'll learn how to avoid accidentally destroying nests when we care for the garden.

## *Who will enjoy the garden?*

We design our gardens for the people, pollinators, and other wild things that will be in it. Who are they?

You (the gardener) might be the only person, but likely your friends and family will be there too. So, do we need to design for children or older people? Will you have a special spot to sit in for enjoying the garden? Or is it a public garden which may need to withstand higher foot traffic?

Which pollinators are you especially interested in? If you want a wide range of species you'll choose one set of flowers, but if you were mostly interested in hummingbirds or bumblebees or butterflies, your choices will differ.

My gardens don't just have pollinators. Many other birds and insects come to them, and I have to take into account my dog, neighborhood cats, and the night-time visits of raccoons, opossums, and skunks. I put rocks on top of new plants in the water garden because curious raccoons dig them up at first but lose interest after a week or so. I have a few shallow spots that birds can bathe in, with foliage nearby so they can "sneak up" to the pond. This makes them braver when I sit nearby. But it's not dense foliage so cats can't hide there to hunt the birds.

*our Labrador thinks the pond is hers!*



## *When will they be in the garden?*

When will you be in the garden? Will it be before or after work, in early morning or late in the day? Most butterflies and bees don't fly in the cooler hours, but birds and bumblebees do. Will it be in spring and fall only (e.g. a school pollinator garden) or in full summer (perhaps a cottage garden)? Time of day and season will help you focus your garden design.



## *How to make a pollinator garden*

When will the garden help pollinators the most? Bumblebees and birds have special needs in spring and early summer, while monarchs use the garden from late June through September. If your garden is only sunny part of the day, you'll choose flowers benefitting pollinators flying then.

When will you plant the garden? Spring is the best time but early fall works surprisingly well. If you plant in summer, better have a good supply of water the first season!



*Beebalm (Monarda didyma) and a Hummingbird Clearwing moth*

When will you rake, prune, or clean the garden? For bees nesting in old stems, removal in fall is fatal, but pruning to leave old raspberry or blackberry stems as six inch stubs for one year longer than usual adds habitat. Other butterflies and bees overwinter under loose bark or dead leaves – tidying these up before summer removes the next generation. But deadheading - removing old flowers as they fade – can make

some wonderful flowers like beebalm bloom months longer.

## *Where will the garden be?*

Will your pollinator garden be private, or in a public spot? Hummingbirds tend to be a bit shy, and won't hang around if there's constant foot traffic near the flowers. And public gardens have to have semi-indestructible plants and paths. On the other hand a sufficiently large public garden, like downtown Toronto's Music Garden, can be designed to have a series of more private "garden rooms". So public/private is the first part of "where".

Will the garden be in an urban setting or in the country? In cities deer eating the plants are such a big problem, but then the country gardener doesn't have to cope with the 20-story condo built just to the south of the garden! Paradoxically, continuous flower bloom may be more important in the country garden than in the city – we'll come back to this, but nesting sites are definitely something city gardens need to provide.

Will your garden be planted in the ground or in pots – and if you answered “pots”, on a first floor deck or a 10<sup>th</sup> floor balcony? Though most of our pollinator garden designs assume an in-ground garden, the Projects section has advice on a Balcony garden too.

Where the sunlight falls in the garden is a crucial factor. Simply put, the more sun the better! But even if you have a partly shaded lot, you can still grow good flowers. A fully shady location might focus on spring flowers and nesting sites.



*the High Park pollinator garden has dry sandy soil on a slope*

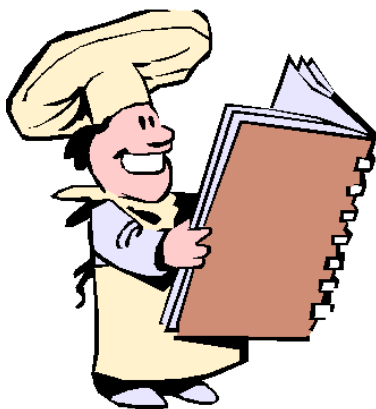
Where good or poor soil is found in the garden site is obviously important, but it may be backward to what you guessed – many long-blooming native plants will put on a better show in a “poor”, unfertilized soil. The High Park pollinator garden has a dry, sandy soil but natives chosen for that site thrive there.

If you're planning a water feature, where will it be? Next to the house may mean unwelcome raccoon visits late at night. Even without a pond, can you use downspout runoff to create moister areas in the garden? You'd be surprised how many kinds of butterfly come to drink from mud or damp soil!

One last “where” to consider – are there other habitats or gardens nearby you can re-use? For instance, my country pollinator garden is next to a big clay bank, so I don't need to worry about providing sites for ground-nesting bees. A patch of crown vetch put in many years ago on that hillside for erosion control supports Duskywing caterpillars; the adult butterflies then come to my garden for nectar.

Bigger is better for many pollinators – if you put your garden next to a neighbor's, it may be more than twice as attractive to many species. After sunshine, the other big success factor in attracting pollinators has been shown to be the total area of flowers. So put your pollinator garden just across the fence from the Smith's next door (so long as they don't spray pesticides) and you'll both see more winged visitors. It's a win-win for you, the neighbors, and the pollinators!

## How to make a pollinator garden.



So, you've thought about why, what, who, when, and where to make your pollinator garden. What next? Let's get specific – in the next few pages I'll give you a recipe for actually designing and making your garden.

It's not a cookbook recipe – you'll still need to choose among some of the ingredients listed. Those choices will be helped by your answers to the five W questions we just looked at. By the time you've added all those W's to the How, you should get Wow!

Here are the main steps in the recipe and their essential ingredients. We'll spell them each out in detail in a moment:

Form a team	<i>Ingredients: helpers to taste</i>
Make a plan	<i>5 w's, paper, pencil, thought, advice, budget!</i>
Choose the plants	<i>Plant pictures, suppliers, budget!</i>
Prepare the site	<i>Shovel, trowel, gardening gloves, helpers</i>
Plant the garden	<i>Plants, helpers, water, labels</i>
Care for a new garden	<i>Water, water, water!</i>
Continuing care	<i>Pruners, hoe, gloves, time, patience</i>



## ***Form a team***

Well, maybe! If you're doing *everything* yourself, you're a team of one. But even if you're a total do-it-yourselfer, you may need to bring housemates or neighbors onsite. Or maybe you have a bad back and would like to use a contractor to help in the heavy work? Just possibly, you might be aiming for a very elegant design and are going to work with a landscape architect or designer.

If you are doing a public pollinator garden you'll probably want to get together a group of like-minded people to help. Use of public space is a privilege, not a right, and town planning departments and politicians are more responsive if they see a request for use of public land that's backed by a group of citizens. The same is true for school gardens and school boards.



*the High Park pollinator garden has a team of helpers*

Another issue public gardens have is long-term maintenance – after the initial enthusiasm, who will still show up to weed and prune months later? That's why putting together a team of fellow gardeners and keeping their involvement is so essential for public gardens.

## ***Make a Plan***

What's a garden plan? It includes a sketch map of the site (a "plan drawing"), a list of goals you want to achieve, and a list of things you'll have to do (task list) to achieve them.

## *How to make a pollinator garden*

Let's start with the list of goals. You'll have an easy time listing them because they are the answers to the 5 w's we went through in the first few pages. So, take a pen or pencil or keyboard in hand and write down your answers:

- Why do you want to make a pollinator garden?
- What will provide food, drink, and home sites?
- Who will be in the garden?
- When will they be there?
- Where will the garden be?

Look back at the details in the 5 w's pages to think out answers to these that really suit you and your garden. Congratulations! You've just done the first third of your plan!

Next is the sketch map and the list of tasks. I do these together because drawing the sketch makes me think of tasks to do, and writing down tasks often makes me revise the sketch!



*Question Mark feeds on fallen pears.  
Do you have fruit in the garden?*

For your task list, start with the main recipe steps: form a team, make a plan, choose the plants, prepare the site, plant the garden, care for it, and continuing care when it's established.

You've already thought about forming your team, so what's involved in planning for plant choice, site preparation, planting, and care? Your garden site and the kind of plants you want to grow need to match. For example a dry sandy site demands plants that tolerate

drought, while a site with a high fence or wall can have taller plants in the back than one a small garden next to the street. And, if you're planting next to the street, remember that the garden must look tidy to the neighbors or the city may come and mow your garden down!

## ***Budget!***

There are more details on the kinds of plants to choose in the next section, but in your plan you want to think about where you're going to get them. What's your budget, and how fast do you want the garden to look mature? Starting with bigger plants is more costly but looks "done" quickly, while starting with seeds can be quite cheap but can take a year or so to look great. And if you want to start with plants, will you get them from neighbors who have clumps to divide, or will you be buying from a garden centre?

**\$\$\$** A quick way to get a budget is to multiply the length and width of the garden (in feet) to get the number of square feet. For example, a 2 feet wide by ten feet long garden is 20 square feet. Now, if you plan to have mostly smaller plants, you will want about 20 plants (one per square foot). If you'll have a mix of sizes, plan on dividing by 2 – that is, around 10 plants in our example. And if your garden will mostly be larger plants like false indigo or the perennial sunflowers, divide by 4 – so the example garden would use 5 plants. If you are buying plants, expect to spend between \$3 for smaller plants and \$10 for big, special ones. \$5 per plant is about right for a rough guess. So, our 20 square foot garden might cost between \$25 and \$100 for purchased plants (these are 2011 estimates).

Add in the cost of any tools or construction materials you will buy (for instance stone or brick or gravel if you build paths, or wood for fencing, etc.) And of course if you are hiring help budget for their time. A contractor can of course quote the whole project for you – ask for a firm not-to-exceed quote and unless the contractor is highly recommended by people you know, get a second or third quote.

If you want to have a small pond, do a separate budget for it: ponds give great satisfaction to human gardeners, but cost varies greatly. Expect to spend around \$2-\$3/square foot for a pond liner and underlayer, or a container. You may spend from \$100 and up on a good pump with biological filter attachment and fountain – the fountain attracts birds, soothes people, and above all it and the filter keep the water clean and aerated.

You need a safe source of electricity for the pump – talk to an electrician how much this will cost if you don't already have an exterior outlet that is ground fault protected - take no risks with water and electricity, the pond is for growing things, not electrocuting them!

Ponds plants and fish have been in vogue long enough to make them a bit pricey. If you want a good native waterlily, a healthy plant may cost \$30-\$50. Other good plants like the blue-flowered Pickerel Plant (*Pontederia cordata*) may cost \$5-\$15 each. The good news is that adding that indispensable native fish, the unfortunately named Fathead Minnow (*Pimephales promelas*) is cheap – they are sold as feeder fish in bait and fish hobbyist stores.



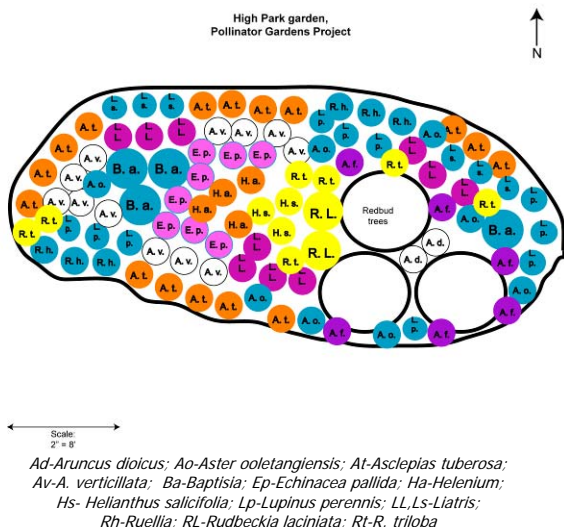
*Spring petals fall on lily-pads and pickerelweed shoots in my pond. Minnows swim below*



## How to make a pollinator garden

So, let's budget for a 4' by 5' garden pool. If you do all the work, already have a nearby electrical plug, and keep it simple your pond might cost \$100 for liner, edging, and related materials, another \$100 for pump and accessories, and perhaps \$40 for plants and fish. \$250 is not cheap, but it will give you a very nice basic pond that you can add to over time. If on the other hand you add other ingredients to the recipe, or have the pond installed for you, you will probably pay \$500-\$1000 or more. Or best of all, you live in the country and there's a natural pond or pool on your land – can we come and visit?

All along of course you've been sketching how all these parts of your garden will look. At this point I try to do a clean map. Use papers and a few small circles (outlines of coins, etc) to draw plants approximately to size, or if you are computer-mad like me, use a drawing program. I find this convenient for large plans because I can cut-and-paste copies of a plant's symbol. At this stage some of the plants may not have names – don't worry about this, just choose size and color for now. In the next section you choose actual plants and you can change the sketch then.



## Choose the plants

I enjoy this step a lot! This is the time to dream about how your garden will look in full bloom, but it's also the time to be hard-headed about what will grow well in your garden and meet the needs of pollinators.

The first thing you'll want is a good guide to native plants. We'll meet a few of them in these pages but these are just the tip of the iceberg. A list of books and websites is in the Appendix at the end of this booklet.

How do you pick plants from the many kinds available? Go through the ones you find attractive and choose based on these seven criteria:

1. How tall is it?
2. Does it need sun or shade?
3. Normal, moist, or dry soil?
4. When and how long does it bloom?
5. What colour are the flowers?
6. What shape are the flowers?
7. Is it a good nectar or pollen source?

1-3 above are criteria used in any garden design, but 4-7 are particularly important in a pollinator garden.

Make sure to put tall plants at the back of the garden and short ones up front, and meet their needs for light and soil – those are the basics.

Pollinators need flowers from spring until fall. Choose a mix of spring, early summer, late summer, and fall-blooming species. Among the kinds flowering at any point in time, some will bloom over a longer period. Bee-balm is a good example – it starts flowering in July and if you trim flower heads off when they're done, it will keep blooming well into fall. If you have a small garden, picking long-flowering plants helps get continuous bloom.

Colour is important to you, the garden designer, but it's also important to some pollinators. Hummingbirds in particular like red or orange flowers, but I have seen them very happy with blue salvias. Flower *form* is more important to pollinators. Hummingbirds, orioles, long-tongued bumblebees and butterflies look for flowers with a tubular form – for example, trumpet-vine (*Bignonia*) or honey-suckle, columbine or penstemon.

Long tongues or beaks allow these pollinators to get nectar that the more abundant honeybees can't. On the other hand, some of the small native bees specialize on smaller flowers that the honeybees may pass over. That's why it's good to have a good mix of flower forms in your garden.



*Ruby-throat hummingbirds and trumpet vine (Bignonia). Illustrator: Peter A Anastasi, 50 birds for town and garden, 1973. US Fish&Wildlife*

### *How to make a pollinator garden*

Spring is a tough time for new queen bumblebees – they have to find and start a nest all on their own, and won't have help for about 6 weeks while their first generation of daughters is growing up. So the queen needs easy access to flowers from May until mid-June, the times she's doing all the work. Flowering shrubs and trees are a great help in spring – we notice the trilliums and violets, but bees notice the pussy willows (an excellent pollen source), redbud, buckeye, honey-locust and catalpa trees. If your garden isn't big enough for a tree, work with your neighbors to get some of these attractive species planted along roadsides and in parks nearby. Many towns and conservation authorities provide native trees for free in public sites – ask!



*honeybee on pussy willow blossoms*

## *Care for a new garden*

Planting a new garden is work, but also great fun, because you're seeing your plans and dreams taking shape before your eyes. First let's talk about planting, and then we'll get into tender loving care for the new plants.

How you plant the garden depends mostly on two things: what soil you start out with and what plants you have.

If you are using an existing garden bed, great! You don't need to do anything to get native plants to grow, except to **cut back** on fertilizers and soil amendments. But if you are planting on what used to be lawn or unimproved soil, you have a bit more to do. Your biggest problem is **not** improving the soil – you're not planting a vegetable garden here – it's weeds.

What's a weed? The only true answer is "a plant that grows where you don't want it". Lawn grasses, for example, are not weeds where they're wanted, but they are good survivors and can fill up your pollinator garden if you don't take steps to remove them. The big problem is their ability to come back from roots, which is shared by many other weeds like dandelions or Queen Anne's Lace. The solution? Lasagna!



“Lasagna bedding” is a cute way to describe using layers to block weeds and give new plants a head start. The bottom layer of the lasagna is newspapers laid at least 4-5 sheets thick to block grass or weed growth. This will slowly break down, but the weeds will be gone by then.

Lay the sheets with a good overlap so roots and shoots don't slip through. The next layer up can be any ordinary soil that doesn't have weeds in it – for instance the “triple mix” sold at garden centres. You only need about an inch of this. If you'd like to be fancy, put another inch of sand or fine gravel on top of the soil layer – this helps keep new weeds from establishing. If you make this lasagna a week or two before planting that gives the lawn or weeds underneath time to smother.



*Lasagna bedding put this garden on top of a lawn*

Now you're ready to plant! You need to use a trowel or spade to cut a hole through the newspaper into the sod or earth underneath, just the size of the pot the plant is in and perhaps ½ inch or 1 cm deeper. Carefully pop the plant out of the pot, set it into the hole, and brush the sand or gravel or soil from your top layer over it until it's level with the surrounding surface. Water well! This means soak it once, wait 15 minutes, and soak it again.

What plants did you just plant? Were they all in larger pots (4" across or bigger) or were they small “plugs” or transplants? The smaller the plant the more help it needs to get through the first few weeks until it sends out more roots. And, even if you had a bigger pot, if the part above the soil is much taller than the depth of the pot, you may have better luck if you snip off some of the top growth. A plant with too many leaves and not enough roots is likely to wither in hot sun. Another way some gardeners deal with this is to partially shade the new plantings for a few days to a week with cloth or screening that lets some light through.

## *How to make a pollinator garden*



*water the new garden for up to 2 months*

Even after the crucial first week is over, your young plants need continuing care – mostly watering, unless you're lucky enough to have copious, regular rains. It may take your new plants up to 2 months to get well established. During this time, give the garden a good soaking at least once a week, more often if plants are withering. It's better to water longer but do it less frequently, to encourage the roots to search deeper for water.

Mulch (bark, leaves, compost, etc) is great for keeping the soil moist, but needs thought in a pollinator garden. Some bees nest in the ground, and thick mulch keeps them away. On the other hand, some butterflies pass the winter as chrysalises under bark or in the top layer of mulch. So, design your garden with mulched and unmulched soil. Keep part of the mulch undisturbed to allow butterflies to winter over in it. If you have a dry spot, instead of fighting it, enjoy it – ground nesting bees like drier soil, and you can plant drought-resistant plants there.

## *Continuing **Care** for established gardens*

Pruners, hoe, gloves, time, patience – the difference between a pollinator garden and a restoration project is that you want to keep your garden looking like a garden. There's no such thing as a free lunch or a zero-work garden, although a well established pollinator garden is less work than a typical formal garden.

Once your garden is several months old, you should taper off watering and eventually stop. From now on you want the plants to toughen up! Don't fertilize, and don't worry – native plants are adapted to low fertility, drier soils.

A good pair of hand pruners is very helpful. Even in their first year, perennials like bee balm will benefit from "dead-heading" – removing old flower heads to encourage fresh ones to form. Be judicious – I definitely leave seed heads on many plants to give winter and spring birds a treat. If you find the look of the developing seed-heads "untidy", here's an exercise for you.



*milkweed pod silk shines silver in winter light*

Choose some stalks that are mature and beginning to dry. Cut them with your pruners and do an indoor arrangement in a vase using only these stems – no water, no soil, no plants. If you practice, you'll find you can create very attractive compositions. Enter them in a fall fair in your neighborhood! Now when you can see the beauty in these seed pods, try leaving some in place in your garden through fall and winter. Feel free to thin and prune them with your pruners, but leave some outside. Some of the most attractive additions to a winter garden are late-opening weed pods or wild clematis seed heads topped with a cap of fresh white snow.

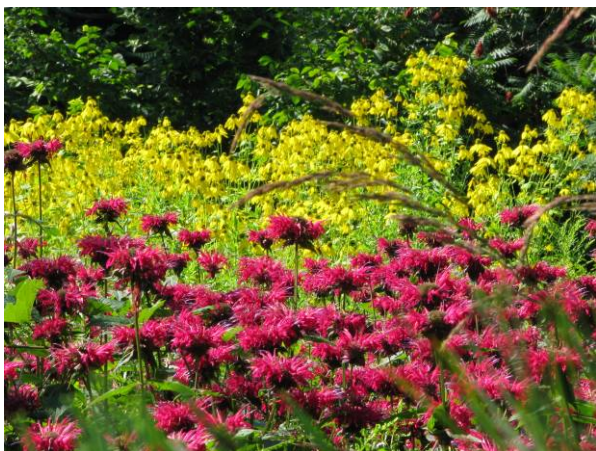
Pruning plants will be **much** more vigorous in the second year, and you might find some of them are crowding other smaller kinds. Pruners! It's natural for a few species to overgrow their appointed spot, and it's you the gardener who needs to persuade them to share and share alike.

Hoe! Weeds will always pop up, and it's up to you to chop them down. Mark your own plants carefully (I've been guilty of hoeing down great flowers when they were small in an excess of enthusiasm) but then have at the weeds. I find that mid to late spring is the busiest time for weeding, before the soil dries and your plants shade the soil. The good news is that each year there is less weeding to do, because your plants become tougher and tougher competitors. I find that once a week in late May and early June, once every two weeks until August, and then once a month is about right. This is definitely a case of "*a stitch in time saves nine*" – it's much easier to get rid of weeds when they're small.

If you have bee condos, bird baths, or other "buildings" in your garden, cleaning is an important chore. Bird baths need a scrub brushing once a month or more often. Bee condos should not be touched until after the new bees have emerged in May and early June. Ideally, you have a spare clean condo to put out in April for the new bees to inhabit; put it close to the old one. Then you can take the old one down in June, open it up, and use a scrub brush and water with a little bleach to clean it out. If you forget (June can be a busy month!) leave it for next year.

## How to make a pollinator garden

If you have built bumblebee nesting spots, these are the exception to the rule – they **aren't** used over the winter, so you can dig them up (see below, Bee Nests) and clean them out after first frost. Bumble queens will be out hunting for nest sites early in the spring, so re-bury the nests in the fall after cleaning.



Bee balm in my country garden, with tall coneflower behind

Spring is time for removing parts of clumps that are too vigorous. Bee balm is a prime example – you'll find new plants popping up from runners up to 1-2' from the mother plant. In April or May, the runners are easy to dig up with a trowel – they're shallowly rooted – and remove or transplant. If there are neighbors who don't have pollinator plants, this is a good time to give them a

few presents from your garden! If you have a large space, you can let the spreaders spread for a year or two – in my country garden I let the bee balm spread to a clump 6' wide. A constant stream of hummingbirds, bumblebees, and butterflies visits this clump from July until September.

Perennials aren't trees – they don't always live for decades. Some, like wild lupines, only last a year or two in one spot, while others like wild indigo can last a lifetime. So it's likely that spring will reveal one or two holes in the garden asking for a new planting. This is the time to evaluate how the garden looked last year and ask yourself what colour or form you'd like the replacement plant to have. You can choose something new or divide a clump of something you really liked.

One trick of spring renewal is that a few wise Canadian natives are justly suspicious of when spring truly starts. Anyone living north of Toronto knows what a May frost or snowstorm can do to less hardy foreign plants in gardens. Milkweeds, especially Butterfly milkweeds, are champion weather pessimists and often won't show growth until early June. The Swamp rose-mallow (*Hibiscus moscheutos*) is another late starter. However, anything that hasn't shown growth by mid-June is probably dead.



Seedlings from your plants will be abundant from the second year on. They can be a wonderful resource if you learn to identify them. For plants like wild lupines, seedlings are the very best way to keep them going. One trick to know is that the first pair of leaves (the “seed leaves”) in a seedling often looks very different from mature leaves. You may need to wait for the second or third set of leaves to identify the seedling. If you’re new to this ask an experienced gardener for help.

A mature pollinator garden yields crops other than nectar and pollen. A pussy-willow can get too big in 3 or 4 years, but willows respond wonderfully to hard pruning after the spring bloom is finished. Cut them back to 1’ on half the stems; cut the other half next year. Remember to do this soon after the pollen finishes to get best regrowth. The slender willow wands from pruning make great supports elsewhere in the garden, or they can be woven into interesting shapes for fencing or garden art.

If you have raspberries or blackberries in your garden, you know that they fruit best from year old stems, and that 2-year old stems are usually removed. If you vary this pruning just slightly to leave a 6-12” stump, you’ll find that stem nesting bees love boring into the cut end of the exposed canes. Don’t worry – they do no harm to the living plant. You can keep the pruned stems, which are often quite long, and make a bundle of them or weave them into structures that become natural bee condos. I place mine on top of a pergola where they are out of the way and get some sun.



Woven nest of Baltimore Orioles

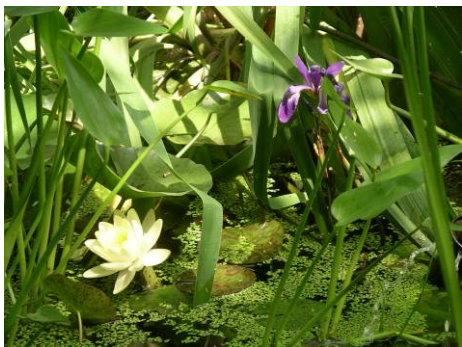
One of the most interesting crops is old stalks of milkweeds and other perennials that have relatively soft, fibrous strips in the stem. I have often paused from May digging in my country vegetable garden to watch Baltimore orioles tugging just so on these stems to tear off long strips. Orioles weave marvelous nests using any natural “yarn” they can get – stems, grass stalks, flexible twigs – but in the city you wild often find colorful shredded plastic and string woven into urban nests.

Since orioles are pollinators, are beautiful to look at, and have delightful songs, I do everything I can to make my garden welcoming to them, including not chopping down last year’s stems until nest building is done.

### *How to make a pollinator garden*

Continuing care of a pollinator garden is one of the most enjoyable jobs there is. As you work in your garden you get to know the habits of its visitors and residents. You can gradually shift the look of the garden based on your own observations of what works and what doesn't.

My own gardens are mature and large enough that I now have the delightful task of choosing new spots for chairs and benches. My family has found that good places to read, sip a drink, watch the bustle in the garden, or just snooze are much in demand.



*Wild blue flag iris and waterlily*

In the country garden, a young pine is just tall enough now that I can sit in a natural blind, cool and surrounded by resin-smelling branches, just a few yards from the giant bee-balm patch. A cool drink on a hot afternoon, a camera on a tripod, and patience allow me to capture many fliers visiting the flowers.



*Put a spot to sit about 3-4 meters from beebalm*

## ***Nests and Condos***

Have you ever put up a birdhouse? Hummingbirds simply need some dense bushes, while orioles will weave their own nest given a tall tree. Butterflies don't nest, but some do need overwintering sites. But providing places for native bees to nest can have a big impact.

Native bees nest in holes in the ground, in old beetle tunnels in rotting wood, and inside of pithy stems. Each species has its own nest needs which are instinctive and don't allow for substitutions.

There are many species of bumblebees in our area. The most common nest site is in an abandoned mouse or chipmunk burrow. Each new queen starts her own nest, and with an old mouse nest, she gets a pre-dug tunnel and often the warm fur with which mother mouse lined the nest. This is important because baby bumblebee larvae need warmth to grow. When the nest is new, the queen alternates her time between flying out to forage for nectar and pollen, and sitting on her nest to incubate the young. She has an almost bare "brood patch" on her abdomen which she places over the young to keep them warm, but the insulating materials left by the mouse or brought in by the queen help too.



You can make bumblebee nest boxes. Put them slightly out of the way of people traffic – bumblebees are not as aggressive as honeybees but they don't like disturbance. Boxes should go in the ground in fall or at the latest very early spring. Boxes should be made of a non-toxic, waterproof material and should be about 8"x8"x6". One end should contain a circular exit hole about 5/8" in diameter. Put cotton wool or a similar insulation material into the box before closing it – the bees will sculpt it around the nest for warmth. Some bumblebee species will use a box placed on the ground, while others want to go down into a tunnel which imitates a burrow. Some flexible tubing with one end in the box, buried under a few inches of soil, another at the surface, and a downward-dipping U with a hole in the bottom for drainage make an entryway.

I highly recommend mounding up a hill of earth 6" to 1' high, with a south-facing bank, and burying the box inside this with the exit to the south. Smaller native ground nesting bees will also use sunny banks. My first city yard was on a steep slope facing southwest – every spring a swarm of small Andrenid bees emerged from dozens of tunnels in this bank to gather pollen of spring flowers. Any rock garden with a south or west facing wall can be made into a bee rockery by putting a thicker layer of soil between some of the stones in the wall for the bees to burrow in. Bumblebee nests should go inside the wall with the exit tubes coming out between two stones.

Bumblebee boxes should be cleaned in late fall. For the more ambitious, read the detailed instructions on how to keep bumblebees in observation nests in the book by Kearns and Thompson (*More Information*, pages 29-30).

Other ground nesting bees will use any bare soil to dig their nests, but a small bank or slope without too much vegetation makes it easier for them to dig. Why? Some bees will dig tunnels several feet long. For a ½" bee, this is like you or me digging a tunnel 120' long. You can imagine that it's much easier to haul out the soil from this dig sideways, rather than carrying it up a twelve story high shaft! If you have a site like this in your garden, remember that the next generation of bees spends the winter in the nest tunnel, so avoid digging in this area until they emerge in spring.

I always keep a few old logs in my garden. If they are soft enough, wood-nesting bees can dig their own tunnels, but it's quite easy to take an electric drill and turn the sunny side of the log into an apartment building for bees. Use drill bits of various sizes to attract a number of species and make the holes as deep as the bit will go.

Stem nesting bees love old raspberry or blackberry canes. Hollow stems are not favored, because they make it easy for enemies to get in. These bees prefer a stem filled with soft pith, which they can burrow into to make a nest tunnel.

You can make a condo for wood- and stem-nesting bees. Many artists and artisans are experimenting with bee condos (links, pgs 29-30). I've already described two simple designs – drilling holes in old wood or bundling pithy stems together. If you want a less rustic condo, you can make one by grooving one side of a 6" piece of exterior plywood using a router and a bit that makes a round groove. Don't carry the groove all the way across



*Condo for wild bees*



the board – you want an entrance only in one end. Do this with several boards, using different bit sizes. Bundle the boards together with an ungrooved board on top for a roof, and you have the bee condo shown, which has room for 30 nests. Mount it on a pole or a tree or against a fence in a sunny spot in early spring.



The condo above has thin plastic spacer strips between boards that make it possible to gently slide one board out to look into the nests, without harming them. Here's a board from a condo with 7 nests, mostly from leaf-cutter bees, at the end of the summer. This picture was taken with the transparent spacer still in place to avoid disturbing the nests.

As long as you don't disturb them too often, following the development of native bee nests in your condo is a fascinating summer pastime. A good guide to help you identify these bees is Laurence Packer's "A Guide to Toronto's Pollinators" (pg 29-30) – which despite its name should work well in most of Ontario, Quebec, and New York State.

Whether you provide bee nesting sites by naturally with south-facing banks or pithy stems, or by condos and boxes, you'll be delighted by the interesting behaviours and enhanced pollinator activity you'll bring into your garden. For fun, put one ear against the side of a bee condo some warm afternoon.

You may be able to hear the sounds of mother bees scraping, cleaning, and packing pollen! Try visiting the "Resonating Bodies" website of sound artist Sarah Peebles (pg 29-30) for recordings of sounds from a variety for bee nests.

## Plants for the Pollinator Garden

There are literally hundreds of good plants for your pollinator garden, so in this section we'll list just a few star performers. The "Find out More" section points you to books and websites with more details. I've ordered plants by bloom season, from spring to fall. Within each season, the order is from short, front-of-border plants to tall ones.

## Early-Mid Spring

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Bloodroot. *Sanguinaria canadensis*. Pure white flowers in earliest spring, good foliage afterwards. 6-12". Tolerates shade. This poppy family member has a double flowered form too but I prefer the single one, which gradually spreads by seedlings.



Violets. Our native woodland violets give good spring bloom, and as a bonus their leaves feed caterpillars of fritillary butterflies. 4"-10". Some favorites are the blue-speckled white flowers of *Viola sororia* "Freckles" and the delicate yellow blooms of the Canada violet.



Canada Columbine – *Aquilegia canadensis* – thrives in sun or shade so long as it gets some moisture in spring (but can dry up in summer). Beautiful flowers greet early-arriving hummingbirds and queen bees. 6"-2', part shade to sun.



Bluebells – *Mertensia*. The wonderful blue hanging bells are a mid-spring treat, and good for bumblebees. *Mertensia virginica*, Virginia bluebells, is the most commonly available species. Plant it where it gets some spring sun before the leaves come out. Foliage dies down midsummer. 6-18".



Solomon's Seal – *Polygonatum*. White tubular flowers attractive to bumblebees dangle in pairs below the long stalks. A very hardy and almost indestructible plant for a shady border, spreading gradually. 1.5'-2.5'.



Willows – *Salix discolor*. Yes, the pussy-willow is a flower - a good pollen source in early spring. Hosts several kinds of caterpillars. Avoid dry soil. Trim back to keep it a reasonable height. 5'-15'.



Redbud – *Cercis canadensis*. The wonderful pink sprays of pea-like flowers on this small tree are a sure sign of spring. Redbud can tolerate partial shade and is suited to a smaller garden. 8'-20'.

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## Late Spring - Early Summer



Creeping Phlox – *Phlox subulata*. A true groundcover with lovely pale blue flowers. 2"-4", part shade-sun. Also look for shade-tolerant *Phlox stolonifera*, moss phlox *P. subulata*, and woodland *P. divaricata*. Many pinks, reds, and some whites are available.

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Bird's foot violet – *Viola pedata*. Beautiful cut foliage, lovely blue flowers, and a later bloom season make this a choice violet, which can also bloom again in fall. Prefers well-drained soil with some sun – not a woodland species. 4"-8"



Nodding Onion – *Allium cernuum*. Lovely little pink bells look great in the rock garden or the front of the border. 6"-12". Ontario has fewer native spring bulbs, but if you include plants from the western mountains there are many choices to add to well drained beds.



Lupines – *Lupinus*. Our native kind has true-blue flowers and is not as massive as the garden hybrids. Threatened butterflies feed on the leaves. This short-lived perennial reproduces readily from seeds, so let seedpods mature and plant the seeds as soon as the pods open where you want them to grow to bloom the following year. 12"-18"



Water Iris – *Iris versicolor*. This lovely flower can be found next to water over much of Canada. The most common type is blue to purple, but whites and red forms can occur. The leaves of some varieties are an amazing deep purple in spring, then turn green. Leaves 6"-18", flower stalks 12"-24". Trouble free in any moist spot.



False Indigo – *Baptisia*. There's nothing false about the indigo blue of this long-lasting June bloomer. The leaves support several butterfly caterpillars, and it has several herbal uses in the native Canadian tradition. Full sun, 3'-5'.



Honeysuckle - *Diervilla lonicera*, *Lonicera dioica*. Ontario native shrubs like the bush honeysuckle or vines like the smooth honeysuckle are quite hardy and tolerate some shade. Their nectar is what we know them for but some caterpillars eat the leaves. Avoid invasive foreign species like Japanese Honeysuckle.



Northern Catalpa tree – *Catalpa speciosa*. The beautiful white tubular flowers and the big bold leaves make a grand sight in June. A very nice shade tree to sit under on a hot day.

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## Mid-Late Summer-Fall



Wild Petunia – *Ruellia humilis*. Not really a petunia, but the clear blue flowers borne over a long bloom season make this a great plant for front of the border, although in rich soil it will grow higher. Some drought tolerance, sun.

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Butterfly Milkweed – *Asclepias tuberosa*. Bright orange flowers borne for several weeks are very attractive to all pollinators, and monarch caterpillars feed on the leaves. Plant where it is to grow – tap rooted. Can survive drought or grow in normal soil; bloom height depends on moisture. 1'-3'. Full sun



Whorled milkweed – *Asclepias verticillata*. Finely cut foliage and white flowers plus great drought tolerance make this a good milkweed for a dry bed. 1-2', full sun



*Echinacea pallida* is native to Ontario although more people grow *E. purpurea*, the Purple Coneflower *E. purpurea*. Both are easy and very drought and heat tolerant. 2-3', sun. Very long-lasting in the garden.



Swamp Milkweed – *Asclepias incarnata*. Fine in damp soil or normal moisture, the pink to rose to red flowers are a treat for the eye and bring butterflies, bees, and hummingbirds. Excellent host for monarch caterpillars. 3', sun to partial shade.



Coreopsis - . The gay golden flowers of coreopsis bloom over a long period, especially if deadheaded. 2.5-3.5', normal soil, sun. We are blessed with many golden daisy family plants, like the Rudbeckias, which are perennial and come in different heights and forms, such as coneflowers.



Helen's flower – *Helenium autumnale*. All the species are from the Americas, there are many garden hybrids. Very attractive to late summer pollinators. Sun, normal to moist soil, 2-3', a range of gold to orange to red forms.



Goldenrod – *Solidago*. The over 100 species of goldenrods are much valued in Europe. Edison bred 12' tall plants yielding enough rubber from sap to make tires on the Model T his friend Ford gave him! There are varieties for sun and shade, short and tall. Fall honey is mostly goldenrod and aster. Valuable to bees and butterflies in late summer.



Asters – *Aster*. If there is one Latin name you can remember, this is it! Some bloom in late summer but the peak is the fall. Shades of blue and purple are dominant, but there are beautiful whites. The pinks and reds are all artificial selections. The tall (3-5') New England and New York asters are what most people think of, but the blue wood aster (*A. cordifolius*), and the white wood aster (*A. divaricatus*) are great for woodland conditions while the heath aster (*A. ericoides*) gives sprays of very delicate small white flowers in full sun. White aster photo: Charlotte Ekker Wiggins, CC 2.0





# ***Where to Find Out More***

## ***Books***

*I suggest trying one of the books by Lorraine Johnson – great starting points. Lorraine writes from her Toronto garden:*

**100 easy-to-grow native plants for Canadian gardens** 2nd ed. Lorraine Johnson. ISBN 1552856577, Library call # 635.95171 JOH. North Vancouver, B.C.: Whitecap, 2005.

**The new Ontario naturalized garden : the complete guide to using native plants** Rev. ed. Lorraine Johnson. ISBN 1552852008, call # 635.95171 JOH. North Vancouver, B.C.: Whitecap, 2001.

**Grow wild! : native-plant gardening in Canada and northern United States** Lorraine Johnson. ISBN 0679309195, call # 635.95171 JOH. Toronto : Random House of Canada, 1998

*Although Tallamy's book is written for US readers, it applies to parts of Canada. More than a how-to book, it gives the **why** interestingly and engagingly:*

**Bringing nature home : how native plants sustain wildlife in our gardens.** Douglas Tallamy. ISBN 9780881928549, call # 639.92091 TAL. Portland, Or. : Timber Press, 2007

*Can you be an academic expert on bees and still write engaging, funny prose? Laurence Packer proves the answer is YES:*

**Keeping the bees : why all bees are at risk and what we can do to save them.** Laurence Packer. ISBN: 9781554681099, call # 595.799 PAC Toronto : HarperCollins Canada, 2010.

*This pamphlet is a photographic guide to pollinator bees and flies:*

**A guide to Toronto's Pollinators.** Laurence Packer. Call # 571.8642 DAV. Vancouver : David Suzuki Foundation, 2008

*A choice little book by Toronto bumblebee expert Thomson, with practical instructions on nest designs, etc:*

**The natural history of bumblebees : a sourcebook for investigations.** Carol Ann Kearns and James D. Thomson. ISBN: 0870815652, call # 595.799 KEA. Boulder, Colo. : University Press of Colorado, 2001.

*An eloquent modern update to Silent Spring:*

**Silence of the songbirds : how we are losing the world's songbirds and what we can do to save them.** Bridget Stutchbury. ISBN: 0002007282, call # 598.8 STU. Toronto : HarperCollins, 2007.

*The Xerces Society is about knowing and conserving insects:*

**Attracting Native Pollinators: The Xerces Society Guide to Conserving North American Bees and Butterflies and Their Habitat,** editor Eric Mader. ISBN: 9781603426954. Storey Publishing, LLC 2011

*How to make a pollinator garden*

## **Web**

*Shameless self-promotion – my blog has many new topics and pictures -*  
The Pollinator Gardens Project: **[www.blog.pollinatorgardens.net](http://www.blog.pollinatorgardens.net)**

*Great site about bumblebees by Toronto expert Sheila Colla -*  
Save the Bumblebees: **[savethebumblebees.com](http://savethebumblebees.com)**

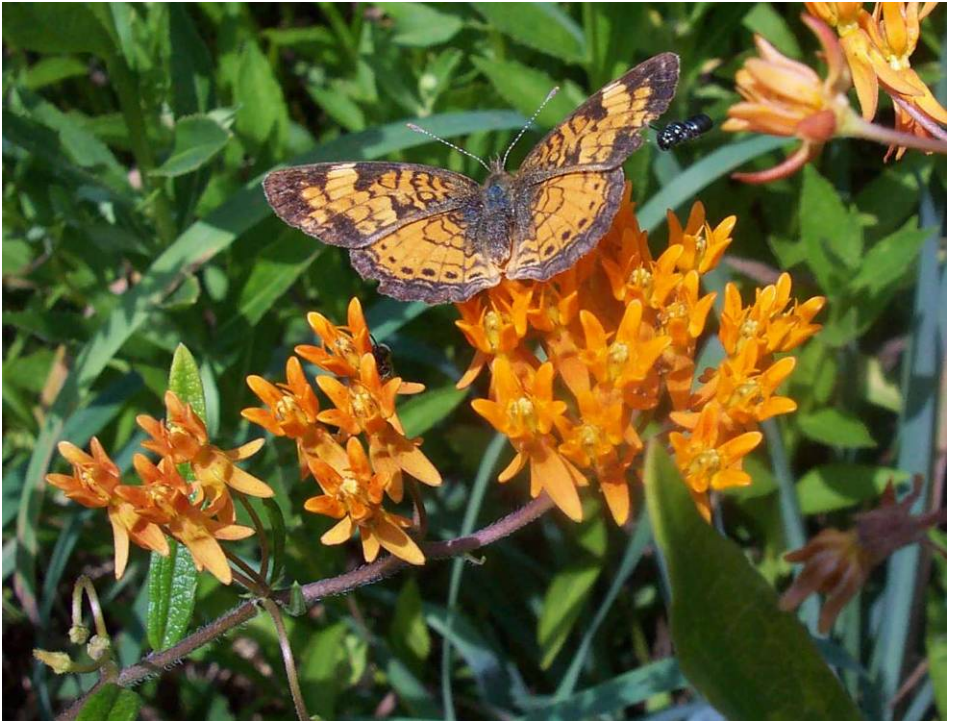
*Toronto-based but continent wide, plant database -*  
North American Native Plant Society: **[nanps.org](http://nanps.org)**

*Toronto-based Canadian charity, plant database - Evergreen:* **[evergreen.ca](http://evergreen.ca)**

*Guelph Ontario group - many resources - Pollination Guelph:* **[pollinator.ca/guelph](http://pollinator.ca/guelph)**

*Xerces Society, all about insect conservation - Xerces Society:* **[xerces.org](http://xerces.org)**

*US-based pollinator protection resource - Pollinator Partnership:* **[pollinator.org](http://pollinator.org)**



*University of Kansas monarch lovers - Monarch Watch:* **[monarchwatch.org](http://monarchwatch.org)** checkerspot butterfly and native bee on butterfly milkweed, *Asclepias tuberosa*



above: Sweet Black-Eyed Susan (*Rudbeckia subtomentosa*) and Beebalm in the author's country garden.

below: Green-headed Coneflower (*Rudbeckia laciniata*) with a Summer Azure butterfly (*Celastrina neglecta*)



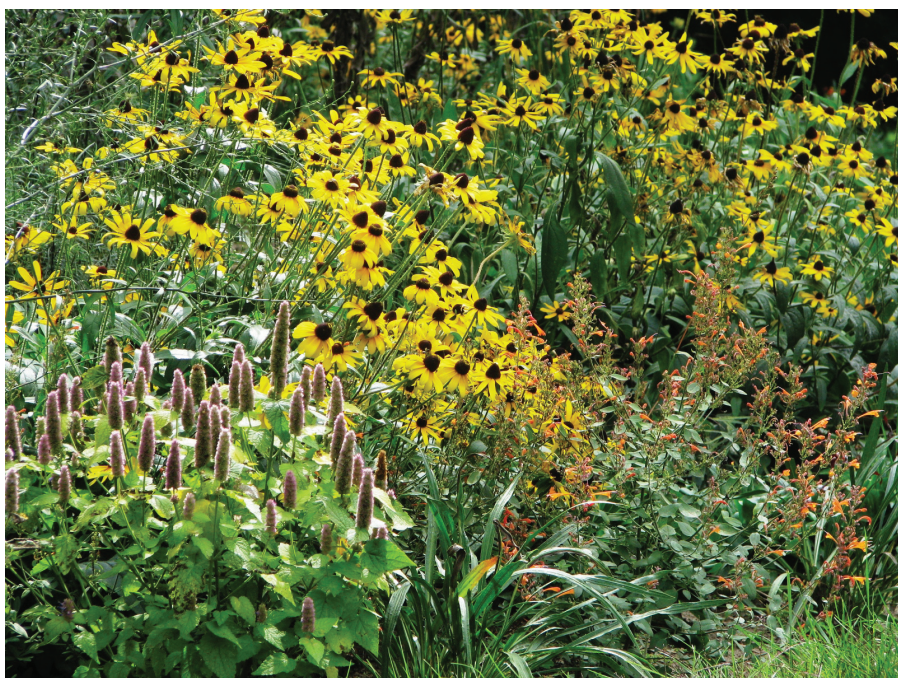




### About the author:

Clement Kent, Ph.D., is head of the Pollinator Garden Project and President of the Horticultural Societies of Parkdale and Toronto. He also researches the genetics of honeybees at York University.

Clement loves sharing his gardening and scientific knowledge with other gardeners.



Design: Leena Raudvee

Illustrations by author except where noted

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Supported by the Pollinator Garden Project of the Horticultural Societies of Parkdale and Toronto

Published 2011 by Godel Computer Solutions Ltd.  
Toronto, Ontario, Canada

ISBN 978-0-9868753-0-4

**[pollinatorgardens.net](http://pollinatorgardens.net)**