



# A Newsletter for GARDENERS OF ALL LEVELS

By Helena Area Master Gardeners

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## Inside this issue:

## Go Native with Pollinator-Friendly Gardens

|  |    |
|--|----|
| Go Native with Pollinator Friendly Gardens | 1  |
| Pollinator Quiz                            | 4  |
| Pollinators and Pesticides                 | 5  |
| Book Review: The Drunken Botanist          | 7  |
| Predators, Pollinators, Parasites          | 9  |
| Spot Spraying Pesticides                   | 12 |
| Plant Profile: Geraniums                   | 13 |
| Gardening Calendar                         | 15 |
| Ask the Experts                            | 16 |

### Sue Leferink

These days our lives can get so busy that we don't have time to stop and study nature. Even so, we want to include plants in our gardens that increase biodiversity and help key stone species such as native bees, butterflies and other important pollinators so that when we do have time to stop and smell the flowers, our gardens will be buzzing with activity. Not only does this bring us enjoyment, but it fosters healthy ecosystems and food for human consumption. Over one-third of the food we eat is a result of pollination.

It is important for pollinators to have their basic needs met: 1) Water, 2) Food, 3) Shelter, and 4) A Place to Raise Their Young. To learn more about how to provide this habitat and qualify your garden as a Certified Wildlife Habitat Garden visit the National Wildlife Federation at <http://www.nwf.org/Garden-For-Wildlife/Create.aspx>. Food must be provided during the entire growing season for both larva and adults. Many varieties of plants will provide sustenance for multiple pollinators.

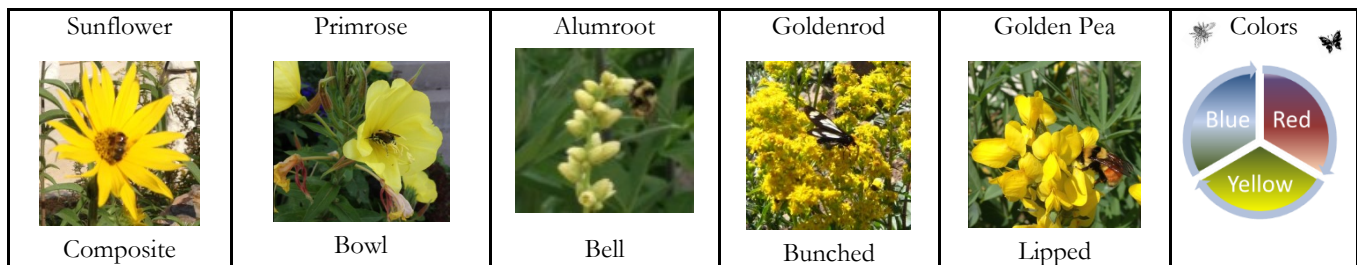
When considering a location for a pollinator garden, select a protected area. This may involve planting a hedge to shelter it from the wind, using shrubs such as chokecherry or currant. Add in natural elements such as interesting rocks with holes that retain water, sandy areas, mud puddles (or pots) and driftwood or natural stumps. The rocks allow insects to warm themselves. Pollinators often land where a patch of ground is moist to drink without drowning. Muddy areas can be used to absorb salts and build homes. The location should not be near bird baths, feeders or houses if your goal is to increase the populations of pollinators.

A pollinator garden is not a garden for perfectionists. A healthy garden has that lived-in look, meaning there will be swiss cheese patterned holes in leaves, patches of exposed soil, dead wood or rocks to provide shelter.

When considering plants to include in a pollinator garden it is important to consider shapes, sizes and colors. A flower should be a composite flower or have a bowl, bell, bunched or lipped shape.

If you have questions or comments, or would like to submit an article or tips and hints, contact us at [Goldcountrymastergardeners@gmail.com](mailto:Goldcountrymastergardeners@gmail.com)

Figure 1: Plant Shapes and Colors



## Go Native with Pollinator-Friendly Gardens ... *continued*

To attract bees, plant white, yellow, blue and violet flowers as a general rule. To attract butterflies, plant bright red, orange and yellow flowers for best results. The larger the flower, the larger the pollinator it can attract due to a larger landing pad and entrance. Keep similar plants together to make it easier for pollinators to collect food. This also creates rhythm and harmony for a beautiful landscape. Plant similar varieties to extend the blooming period. A good example is Goldenrod. Canada, Rigid and Missouri Goldenrod all bloom at slightly different times so if planted together the garden will be blooming for an extra two to four weeks. Penstemon are another great example. They grow easily from seed and there are over a hundred varieties of native Penstemon in many colors and sizes.

If attracting butterflies, consideration must be given to selecting both larvae and adult host plants. Good larvae host plants include Willow, Mallow, Prairie Clover, Milkweed, Wild Plum, Chokecherry, and Cottonwood. Good nectar plants for adults include Aster, Phlox, Tickseed, Bee Balm, Echinacea, Lupine and Serviceberry. Montana is also home to some beautiful moths such as the Police Car Moth and White-lined Sphinx Moth (*Hyles lineata*). Night blooming flowers like Evening Primrose are key to attracting night-time insects and bats to a garden.

There are over a hundred bees native to Montana (<http://www.pollinator.org/PDFs/MontanaBeeGuide-Final.pdf>) but Mason Bees (*Osmia lignaria*), Leaf Cutter Bees (*Megachile spp.*) and Bumble Bees (*Bombus spp.*) are the easiest to attract to our gardens. Mason Bees get their name from using mud to build their nests within existing wooden holes. Their life span is short (March through Early June) but they are extremely effective in pollinating fruit trees. Therefore, it is vital to have many early blooming plants such as Golden Currant, Chokecherry and Field Chickweed. Leaf Cutter Bees then take over the task of pollinating the rest of the summer. These bees carve out leaves to build nesting capsules inside of existing wooden tunnels. Their favorites are Rose leaves. Bumble Bees are the only social bees native to Montana with a similar hive structure to honey bees but on smaller scale (about 50 bees to a hive). They nest in abandon mouse burrows and can fly further than other bees to food sources. Their favorite flowers are Fuzzy-tongued Penstemon and Golden Pea.

A selection of clumping, native grasses, sedges and rushes should also be tucked into the garden between the flowers. How do you tell the difference between them? Well, as the saying goes... "*Sedges have edges, rushes are round and grasses have nodes from their tips to the ground*". Some great choices are our state grass, Bluebunch Wheat Grass (*Pseudoroegneria spicata*), Little Bluestem Grass (*Schizachyrium scoparium*), Blue Grama Grass (*Boutelous gracilis*), Prairie Junegrass (*Koeleria macrantha*), Tufted hairgrass (*Deschampsia caespitosa*), Idaho Fescue (*Festuca idahoensis*), Poverty Rush (*Juncus tenuis*) and Sprengel's Sedge (*Carex sprengei*).

One does not have to go totally native to encourage pollinators in the garden, but it is helpful to tuck in a few. Native plants can also be used as companion plants. For example, native hyssop can be planted next to grape vines to attract pollinators. It adds a wonderful fragrance to the garden

### NATIVE PLANTS FOR POLLINATORS

#### Spring Blooms (Mar-May)

Black Hawthorn *Crataegus douglasii*  
 Pasqueflower *Pulsatilla patens*  
 Silky Phacelia *Phacelia sericea*  
 Oregon Grape *Mahonia repens*  
 Golden Currant *Ribes aureum*  
 Western Serviceberry *Amelanchier alnifolia*  
 Cutleaf daisy *Erigeron compositus*  
 Hood's phlox *Phlox hoodii*  
 Common Chokecherry *Prunus virginiana*  
 Harebell *Campanula rotundifolia*  
 Hairy False Golden Aster *Heterotheca villosa*  
 Prairie Smoke *Geum triflorum*  
 Golden Pea *Thermopsis montana*  
 Narrow-leaf Stonecrop *Sedum stenopetalum*

#### Mid Summer Blooms (Jun-Jul)

Alumroot *Heuchera richardsonii*  
 Fuzzy-tongued Penstemon *Penstemon eriantherus*  
 Wilcox's Penstemon *Penstemon Wilcoxii*  
 Yellow Buckwheat *Erigonum flavum*  
 Blanket Flower *Gaillardia aristata*  
 Silky Lupine *Lupinus sericeus*  
 Sticky Geranium *Geranium viscosissimum*  
 Beebalm *Monarda fistulosa*  
 Yellow Columbine *Aquilegia flavescens*  
 Coneflower *Echinacea angustifolia*  
 Showy Fleabane *Erigeron speciosus*  
 Scarlet Globemallow *Sphaeralcea coccinea*  
 Woods' Rose *Rosa woodsii*  
 Giant Hyssop *Agastache cusickii*  
 Blazing Star *Liatris punctate*

#### Late Summer/Fall Blooms (Aug-Sept)

Rubber Rabbitbrush *Chrysothamnus nauseosus*  
 Missouri Goldenrod *Solidago missouriensis*  
 Canada Goldenrod *Solidago canadensis*  
 Rigid Goldenrod *Solidago rigida*  
 Maximilian Sunflower *Sunflower maximiliani*  
 Common Yarrow *Achillea millefolium*  
 Smooth Blue Aster *Colias eurytheme*  
 Yellow Evening Primrose *Oenothera flava*  
 Showy Milkweed *Asclepias speciose*  
 Prairie Coneflower *Ratibida columnifera*

## Go Native with Pollinator-Friendly Gardens ... *continued*

since it is in the mint family. If selecting non-native plants for pollinators, choose heirloom varieties which have a stronger fragrance and denser nectar source rather than hybrids.

**Take up the challenge!** By planting food sources for pollinators in your garden, you can create a pollinator pathway

(<http://www.pollinatorpathway.com>).

If you have already planted a pollinator garden, show your support and register it for free on the Million Pollinator Garden Challenge website today -

<http://www.pollinatorpathway.com>.

Make it a goal to plant at least five pollinator friendly plants in your garden this year to celebrate National Pollinator Week, June 19-25<sup>th</sup> -

<http://pollinator.org/pollinatorweek/>

which will increase our local pollinator populations. If you are not sure where to start, visit the Montana Native Plant Society web site at

<http://www.mtnativeplants.org/> or stop

by the Montana Wild Education Center at 2668 Broadwater Avenue across from Kessler School to observe a native plant landscape designed just for pollinators. The garden is behind the education center next to the Eagle Rescue habitat.



### **Resources:**

Attracting Pollinators to your Garden Using Native Plants - <https://www.fs.fed.us/wildflowers/pollinators/documents/AttractingPollinatorsV5.pdf>

Butterflies of Montana - <http://www.thebutterflysite.com/montana-butterflies.shtml>

Bumble Bees of Montana - [http://mtent.org/Projects/Bees%20of%20Montana/bumble\\_bees/bumble\\_bees\\_home.html](http://mtent.org/Projects/Bees%20of%20Montana/bumble_bees/bumble_bees_home.html)

Bumble Bees of the Western United States -

<https://www.fs.fed.us/wildflowers/pollinators/documents/BumbleBeeGuideWestern2012.pdf>

Montana Bee Guide - <http://www.pollinator.org/PDFs/MontanaBeeGuide-Final.pdf>

Montana Dragonflies & Damselflies - [http://mtnhp.org/docs/2009\\_odonata\\_checklist.pdf](http://mtnhp.org/docs/2009_odonata_checklist.pdf)

Montana Native Plants for Pollinator-Friendly Gardens -

[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/mtpmcbr11694.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/mtpmcbr11694.pdf)

Million Pollinator Garden Challenge - <http://www.pollinatorpathway.com>

Native Wildflowers and Bees of Western Montana -

<https://www.fs.fed.us/wildflowers/pollinators/documents/NativeWildflowersBeesWesternMontana.pdf>

Selecting Plants for Pollinators: A Regional Guide for Farmers, Land Managers, and Gardeners

<http://www.pollinator.org/PDFs/S.RockyMt.Steppe.rx2.pdf>

Native Plant Landscaping - <http://www.mtnativeplants.org/Native%20Plant%20Landscaping>

Pollinator Pathway - <http://www.pollinatorpathway.com/>



# Connect the Pollinator to Its Food Source or Host Plant!

Sue Leferink

1. Blue Orchard Mason Bee



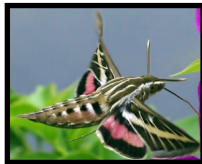
2. Leaf Cutter Bee



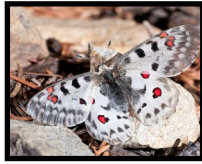
3. Central Bumble Bee



4. White-lined Sphinx Moth



5. Rocky Mountain Parnassian



6. Gray Comma



7. Ottoe Skipper



8. Monarch Caterpillar



9. Gray Hairstreak



10. Spring Azure



A. Showy Milkweed



B. Purple Prairie Clover



C. Gooseberry



D. Woods' Rose



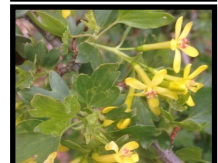
E. Evening Primrose



F. Narrow-leaf Yellow Stonecrop



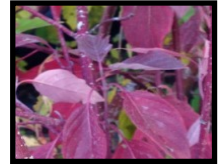
G. Golden Currant



H. Little Bluestem



I. Red Twig Dogwood



J. Golden Pea



## Pollinators and Pesticides

### Judy Halm

When spring arrives each year, we look forward to our gardens, flowers and fruit trees. Often times we end up sharing those plants with insect pests such as aphids, flea beetles, potato beetles or other sap-sucking and chewing insects. In order to protect our investment into the plants and the time to care for them, we tend to look for a magic bullet that will save the plants from pests.



### The Good News...?

One such magic bullet appears to be a class of insecticides developed in the 1980s and 1990s. Neonicotinoid insecticides, or “neonics” for short, are widely used around the world to protect such diverse crops as corn, cereal grains, soybeans, apples, sugar beets, turfgrass and ornamentals from chewing and sucking insects. Neonics are also used for treating seeds before planting, in drenches for soil insects and in flea treatments for domestic animals.

The name Neonicotinoid means “new nicotine-like insecticides”. They are chemically related to nicotine, and disrupt neural transmission in the central nervous system of invertebrates. Unlike older organophosphorus and carbamate insecticides, the neonicotinoids are much more toxic to invertebrates, like insects, than they are to mammals, birds and other higher organisms.



Neonicotinoids are popular because they are water-soluble and can be applied to the soil, where they are taken up by plants and transported to all portions of the plant, including stem, leaves, flowers, nectar and pollen. Since neonics can be applied directly to the soil, the possibility of wind drift and unintentional contamination is reduced. Additionally, depending on the active compound, they can persist in the soil and plant material<sup>1</sup>, conferring long-term insect control. They are also available in sprays or in direct injection.

Neonicotinoids are used on commercially produced crops such as corn, wheat, and soybeans, orchards and grapes, hay and alfalfa, as well as on ornamental plantings, home lawns, gardens and trees. Most corn and soybean seeds planted today are pre-coated with neonicotinoids, meaning millions of acres of cropland have been treated.

The most commonly found neonicotinoids are<sup>2</sup>

- Imidacloprid
- Acetamiprid
- Clothianidin
- Dinotefuran
- Nitenpyram
- Thiocloprid
- Thiamethoxam

### Now the Bad News

Neonicotinoids are easy to use, effective, and long-lasting, so where’s the problem? For the same reasons that they are so useful – they are water-soluble, are taken up into all parts of the plant, and can persist in the soil for long periods of time (Imidacloprid displayed a half-life of 90 to 365 days in EPA studies, and even longer in other studies<sup>3</sup>), neonicotinoids can have a detrimental effect on important pollinators. Neonics do not act only on problem insects, they target helpful insects, as well, including those that prey on insect pests.

Worldwide, the reproduction of nearly 85% of all flowering plants benefit from pollinator activities, as does 35% of crop production.<sup>4</sup> The most recognized pollinator in the United States is the European honey bee, although numerous other insects also act as pollinators, including native bees, wasps, flies, beetles, ants, butterflies and wasps. Unfortunately, the most-used pesticides in the world are the numerous types of neonicotinoids. The potential for pollinator-pesticide conflict are obvious.



## Pollinators and Pesticides... *continued*

Much science-based peer reviewed research<sup>4</sup> has been done over the years on the effects of neonics on pollinators. Honeybees have been the most studied, but any invertebrate, which includes most pollinators, have been shown to be susceptible to the toxic effects of neonicotinoids. The results of the studies have indicated that neonicotinoids can play an important role in causing pollinator decline or even death.

Several large bee kills in the Portland, Oregon area were traced back to neonicotinoids legally sprayed on linden trees, leading the Oregon Department of Agriculture to ban the use of certain neonics on linden trees and other *Tilia* species<sup>5</sup>. The European Union has proposed a total ban on the use of neonicotinoids except for plants grown entirely in greenhouses<sup>6</sup>.

**How can pollinators be exposed to pesticides?** Direct contact can occur when applications are applied while bees are present and foraging on flowers, or when spray or dust drift into areas where bees are present. Nectar and pollen collected by pollinators can be contaminated by spray or drift, or by the systemic action of the pesticides.

Contact with pesticide residue is another route of exposure for pollinators. Because of the long duration of neonics, bees can contact leaves and flowers of previously treated plants and pick up traces of the residue. Additionally, pollinators may consume pesticides in contaminated water and in guttation droplets formed on treated plants.

**How do neonicotinoids affect honeybees?** In addition to death due to direct contact with high doses of neonicotinoids, studies<sup>4</sup> have shown that bees are susceptible to non-lethal doses. These doses may affect foraging abilities, learning, mobility, memory and homing ability (the ability to return to the hive). Overall colony success can be diminished.



There has been much discussion about the role of neonicotinoid pesticides and colony collapse disorder in honeybees. Scientific consensus holds that colony collapse disorder has many causes, including Varroa mites and some products used to treat the mites, fungi, poor quality queens, lack of nutrition, long distance transport of hives and pesticides. New evidence also indicates that the use of high fructose corn syrup as a substitute feed for bees when honey is removed from the hive, may be causing reduced immune system function<sup>7</sup>. An enzyme found in the cell walls of pollen, but not in high fructose corn syrup, stimulates the bees' immune systems to make them stronger. Although neonics are likely not solely responsible for colony collapse disorder, their effects, combined with the other stresses bee colonies face, can lead to reduced ability for the bees to survive. It might be the proverbial straw

that broke the camel's back.

**What can we do to help protect pollinator health?** The best solution is to practice Integrated Pest Management (IPM) on gardens, shrubs, trees and flowers. Learn about IPM from your local County Extension Agent or Educator. Encourage companies where you do business to limit the use of neonicotinoids in their products – some retailers sell bedding plants that have been treated with neonics. Be sure to ask before buying. When buying a pesticide, check the label to see if they contain neonicotinoids; take the list above with you to the store. Clerks in the store may not always be familiar with what their products contain. I was assured by a store employee that there were no nicotine products in any of a store's pesticides, yet I was holding a product that contained imidacloprid as the active ingredient. You will need to educate yourself to protect the bees.

Perhaps the best approach to protecting pollinators is to use the Precautionary Principle: If you are not certain that a product *is safe*, don't use it!





## Pollinators and Pesticides... *continued*

1. J.-M. Bonmatin, C. Giorio, V. Girolami, D. Goulson, D. P. Kreutzweiser, C. Krupke, M. Liess, E. Long, M. Marzaro, E. A. D. Mitchell, D. A. Noome, N. Simon-Delso, and A. Tapparo. “**Environmental fate and exposure; neonicotinoids and fipronil.**” Environmental Science and Pollution Research International; 2014. <https://www.ncbi.nlm.nih.gov/pmc/articles/pmc4284396/>
2. <http://citybugs.tamu.edu/factsheets/ipm/what-is-a-neonicotinoid/>. Texas A & M University AgfiLife Extension.
3. US EPA. EFGWB review of imidacloprid, environmental fate and groundwater branch. Washington, DC: United States Environmental Protection Agency; 1993.
4. Jennifer Hopwood, Aimee Code, Mace Vaughan, David Biddinger, Matthew Shepherd, Scott Hoffman Black, Eric Mader, and Celeste Mazzacano. “**How Neonicotinoids Can Kill Bees: The science behind the role these insecticides play in harming bees**”. November 2016; Xerces Society for Invertebrate Protection, Portland, OR.
5. <http://www.oregon.gov/ODA/programs/Pesticides/RegulatoryIssues/Pages/PollinatorIssues.aspx>
6. <https://www.theguardian.com/environment/2017/mar/23/europe-poised-for-total-ban-on-bee-harming-pesticides>
7. Wenfu Mao<sup>a</sup>, Mary A. Schuler<sup>b</sup>, and May R. Berenbaum<sup>a</sup>. “**Honey constituents up-regulate detoxification and immunity genes in the western honey bee *Apis mellifera***”. Departments of <sup>a</sup>Entomology and <sup>b</sup>Cell and Developmental Biology, University of Illinois at Urbana–Champaign, Urbana, IL 61801. Contributed by May R. Berenbaum, March 21, 2013.

## Book Review: *The Drunken Botanist*, by Amy Stewart

### Dave Belitsky

I started to collect Amy Stewart’s books when she wrote *Wicked Plants* eight years ago. Her books are full of information about plants, new to me, and well worth the time. Being a “plant nerd”, I couldn’t resist buying a copy of her latest book, *The Drunken Botanist*. You really don’t have to be a serious imbibor to appreciate her descriptions of how plants have been utilized throughout history and, in nearly every culture, to produce beverages. This book is not just a description of how grapes are turned into wine. Instead, Amy Stewart has compiled information about how humans have utilized plants for thousands of years to create an amazing array of beverages and other foods.

The book takes you to Mexico to learn of all the tequila variations, like pulque, produced from agaves. It also takes you back in time to learn that “hard” apple cider was a standard household beverage during colonial times. Evidently, cider was preferred because the available water was often contaminated. Reading Stewart’s descriptions of the numerous variations of apple cider, I’m beginning to think that I may have to take that trip to France to experience “real” Calvados.

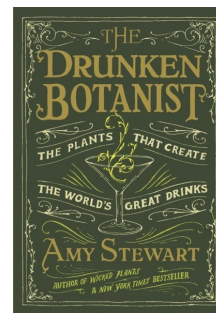
Readers who take the time to read this book will learn:

- Yeast that grows on oak trees somehow made its way to wine vats. In turn, domesticated variants of the “oak yeast” are an essential ingredient of today’s beer, wine, and bread.
- Tips for growing elderberries, currants, hops, and sloe berry. (The namesake for my college-days favorite, sloe gin fizz!)
- The flavor of licorice can be found in several different plants.

Some readers may read this book in a few sittings, especially because of the humorous anecdotes that the author shares. But I use it as a reference book especially for Part II, an alphabetical listing of herbs, spices, flowers, and trees used as flavoring in all sorts of beverages and food preparations.



As Amy says in the introduction: “*I want everyone who walks through a botanical garden or hikes a mountain ridge to see not just the greenery but the very elixir of life—the aqua vitae— that the plant world has given us.*”



The Drunken Botanist: The Plants That Create the World's Great Drinks (Algonquin Books, March 2013)

## Predators, Pollinators, Parasites: Insect Friends in the Garden

### Ann Prunuske

For generations, we have been conditioned to recoil at the sight of a bug in our house or garden – to recoil and grab a bottle of the meanest insecticide we can find. Now, beset with problems arising from the chemical solution to destructive bugs, we are re-discovering how to appreciate the natural balance in nature. Some of those bugs are strong allies of gardeners. So, instead of rushing out to buy chemicals, learn how to identify, attract, and foster Nature's gift of beneficial insects.

"When you kill off the natural enemies of the pests, you inherit their work."

Carl Huffacker

Predator insects get rid of pests in our gardens and crop fields, parasites slow the march of leaf eating insects, and pollinators insure the production of fruit from flowers. This added with your own predator presence in the garden and you have quite a strong defense against plant and crop damage.

Pollinators, such as honeybees, fertilize flowers, which increases the productivity of food crops ranging from apples to zucchini. Predators, such as lady beetles and soldier bugs, consume pest insects as food. Parasites use pests as nurseries for their young. On any given day, all three 'P's' are feeding on pests or on flower pollen and nectar in a diversified garden. If you recognize these good bugs, it's easier to appreciate their work and understand why it's best not to use broad-spectrum herbicides.

### *Beneficials to Know and Love*

**Ladybugs:** Adults range in color from pale yellow to red to black and are often spotted. They are attracted to angelica, tansy and scented geraniums. Larvae look like spiny alligators. Both adults and larvae feed voraciously on small, soft pests such as aphids, mealybugs and spider mites.

**Lacewings:** The pale green or brown, alligator-like larvae prey on aphids, scale insects, small caterpillars and thrips. Adults have large, finely veined wings and feed mainly on flowers including Queen Anne's lace, wild lettuce, goldenrod and tansy.



Stratford Camera Club



**Hover fly larvae:** Also known as syrphid flies, these black-and-yellow- and black-and-white-striped flies resemble wasps, but do not have stingers. They are attracted to bee balm, butterfly bush, marigold and members of the daisy family, and are highly effective pollinators. Females lay their eggs in aphid colonies. The greenish-grey larvae that emerge eat aphids in tight places too small for most other insects.

**True bugs/minute pirate bugs:** This is the common name for insects in the Hemiptera order. Members of this order have needle-like beaks for sucking fluids and leathery wings crossed flat over their backs. Immature insects closely resemble adults. While some are garden pests, many others are allies. Assassin, ambush and minute pirate bugs prey on the tomato hornworm, thrips, leafhopper nymphs, corn earworms and a great number of other pests.





## Predators, Pollinators, Parasites ...continued

**Ground beetles:** These large, iridescent black beetles hide under rocks and logs during the day and move quickly when disturbed. They live in the soil and eat a variety of pests including slugs, snails, grubs, cutworms and root maggots. They are attracted to perennial groundcovers, logs and stones.



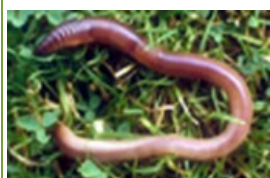
**Spiders:** Although not insects, spiders are often grouped with them. Some of the best predators in the garden, spiders catch their prey in webs or leap on their prey using silk thread as a dragline. Common garden spiders do not move indoors come fall and are nonpoisonous.

**Aphid midges:** Delicate, long-legged adults feed on the honeydew left by aphids. Larvae, which look like tiny orange maggots, voraciously consume aphids.



**Tachinid flies:** These large, bristly, dark grey flies place their eggs on cutworms, sawflies, stinkbugs and other pests. Adults are attracted to pollen and nectar plants including bee balm, comfrey, rudbeckia and butterfly bush.

**Parasitic wasps:** Adults of these mostly tiny and non-stinging wasps are attracted to members of the carrot and daisy families, strawberries and clover. Females inject their eggs into or onto pests such as aphids, flies, beetles and many caterpillars. Larvae grow by absorbing nourishment through their skin.



**Earthworms:** — also not insects — are highly beneficial in gardens. Referred to as ‘nature’s plow’, earthworms aerate and enrich the soil. Worms are highly sensitive to chemical and physical changes, so avoid any synthetic fertilizers, and minimize tillage.

### Attracting Beneficials

One cannot assume beneficial insects will show up and live in one’s garden. Research shows that ample flowers not only sustain them, but also allow longer survival and production of more progeny, thus increasing the natural control of undesirable insects. Insect friends need food, water, and shelter.

To attract predatory insects to your garden to help with pest control:

- Don't use pesticides, especially broad spectrum or residual chemicals. Pesticides rarely discriminate and rid your garden of many of the beneficial insects necessary for a healthy garden. Even organic pesticides can have negative impacts on beneficial insect populations. If there is no effective alternative, use only when pests are present, not as a preventative. Use pyrethrins, insecticidal soap and horticultural oil sprays that leave little or no residual, and only treat areas being damaged by pests.
- Use mechanical means to foil insects, such cutworm collars or floating row covers.
- Plant a variety of flowering plants, especially those with small flowers rich in nectar. Although many of the larvae are predators, these will supply the nectar and pollen by adults and provide safe places for resting and laying eggs.

## Predators, Pollinators, Parasites ...continued

- Dedicate 5-10% of the garden to beneficial-attracting plants – plant for blooms all season long.
- Particularly attractive are herbs allowed to flower, such as coriander, fennel, dill, lavender, thyme, mint, and parsley.
  - Flowers of the composite or daisy family are also appealing to beneficials. Examples include goldenrod, coneflowers, sunflowers, coreopsis, and black-eyed Susan.
  - Intercrop: mix up your plants so that those that attract beneficial insects are near those that need protection, such as vegetables.
  - Place your plants close together to provide a moist, shaded environment for beneficials who dehydrate easily.
  - Provide a source of water by putting out a shallow dish of water with stones to give them dry places to land.
  - Minimize soil disturbance to protect soil-dwelling insects and their eggs.
  - Create mulched or stone pathways to provide shelter for predatory beetles.
  - Allow leaf litter to remain on planting beds to provide overwintering spots
  - Plant ground cover to provide shadowy, sheltered spots for spiders.
  - Keep your soil healthy by adding compost to allow soil organisms to thrive.
  - Attract beneficial insects to your yard rather than buying and releasing them. Releasing insects may rid your yard of naturally occurring beneficials through competition and predation (some beneficial insects, such as praying mantises, feed on both pests and other beneficial insects). In addition, some insects, such as certain ladybugs, are migratory and, once released, quickly move on to other locations.
  - Invest in a good insect guide so that you can accurately identify troublemakers and beneficials.

### Some plants that attract beneficial insects

#### Early blooming

Basket of Gold *Aurinia saxatilis*, Rocky Mountain penstemon *Penstemon strictus*, Native potentilla *Potentilla verna*, Creeping thyme *Thymus serpyllum*, Sweet alyssum *Lobularia maritime*, Columbine *Aquilegia x hybrid*, Carpet bugleweed *Ajuga reptans*

#### Midseason blooming

Common yarrow *Achillea filipendulina* 'Coronation Gold', Dwarf alpine aster *Aster alpines*, Spike speedwell *Veronica spicata*, Cilantro (Coriander) *Coriandrum sativum*, English lavender *Lavandula angustifolia*, Sulfur cinquefoil *Potentilla recta* 'Warrenii', Edging Lobelia *Lobelia erinus*, Mint *Mentha sp.*, Stonecrop (various) *Sedum sp.*

#### Late blooming

Fernleaf yarrow *Achillea millefolium*, Lavender globe lily *Allium tanguticum*, Dill *Anethum graveolens*, Dyer's camomille *Anthemis tinctoria*, Fennel *Foeniculum vulgare*, Sea lavender *Limonium latifolium*, Wild bergamot *Monarda fistulosa*

### Companion Planting:

Many of the plants that provide habitat for beneficial insects are helpful in other ways: some repel pests. The following useful list is taken from *The Bio-dynamic Source: Companion Plants and How to Use Them* by Helen Philbrick and Richard Gregg.

**Cabbage worms** (not to be confused with the cabbage looper) are the larvae of the white cabbage butterfly and are repelled by tomato, sage, rosemary, hyssop, thyme and wormwood.

**Carrot rust fly** is repelled by onions and leeks, rosemary, wormwood and sage.

**Onion fly** is repelled by carrots.

**Mexican bean beetles** are repelled by the marigolds and the planting of bush beans and potatoes in alternate rows.

**Nematodes** are suppressed by marigolds. Nematodes are microscopic worms and more of a problem in warmer climates. To eliminate Nematodes for 2-3 years, seed or plant marigolds solidly.

## Predators, Pollinators, Parasites ...*continued*

**Flea beetles** are repelled by lettuce.

**Colorado potato beetle and the potato leafhopper** are repelled by inter-planting bush beans with potatoes.

**Squash bugs** are repelled by nasturtiums.

Other strongly scented plants mentioned in the literature which may be considered are: basil, catnip, celery, chives, dill, flax, garlic, geranium, horseradish, parsley, peppermint and onions.

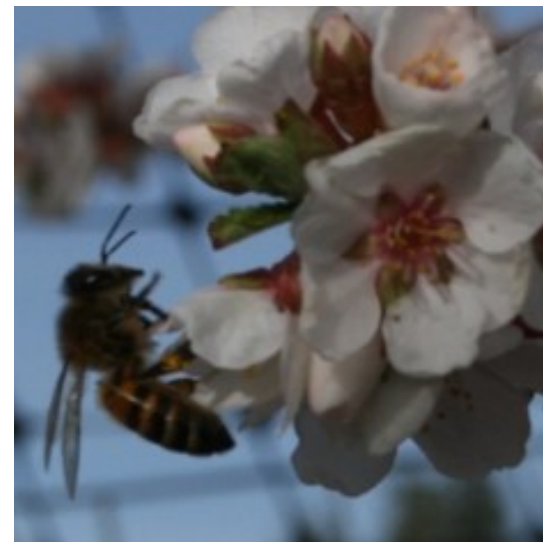
Read more: <http://www.motherearthnews.com/organic-gardening/plants-to-attract-beneficial-insects-zl0z1005zvau.aspx#ixzz2pGx8TmYB>

A gardener who bought fruit trees was given from the nursery owner at no cost some insects to help with pollination. Do you know what these insects were? *They were free bees!*

What do you call a bee that lives in America? Why, of course, it's a *USB*.

Who is the bees favorite singer? *Sting!* Who is their favorite singing group? *The Bee Gees!*

OK, I'll just buzz off now.



### Pollinator Facts from the US Fish and Wildlife Service

[https://www.fws.gov/refuge/Neal\\_Smith/what\\_we\\_do/get\\_involved/pollinator\\_facts.aspx](https://www.fws.gov/refuge/Neal_Smith/what_we_do/get_involved/pollinator_facts.aspx)

About 1 out of every 3 bites of food exist because of our precious pollinators.

Pollinators support biodiversity! There is a correlation between plant diversity and pollinator diversity.

Insects (such as bees, wasps, moths, butterflies, flies, beetles) are the most common pollinators, but as many as 1,500 species of vertebrates such as birds and mammals serve as pollinators too. These include hummingbirds, perching birds, fruit bats, opossums, lemurs and even a lizard (the gecko).

In the U.S., pollination produces nearly \$20 billion worth of products annually

One native leaf cutter bee can do the pollination job of 20 non-native bees



# Spot Spraying of Herbicides in the Garden

## Judy Halm

There are times when a gardener may need to use an herbicide on a particularly stubborn weed in the garden. When spraying a large area is not advisable, there are some strategies to use to limit the area that is sprayed. Make sure to follow all label instructions on the herbicide label, since the label contains safety, mixing and appropriate use information. In addition, the label is the law, and must be followed. Use personal protective equipment as required on the label, such as waterproof rubber or vinyl gloves, safety eyewear, shoes or boots, long pants and a mask. Refer to the product label to dispose of used supplies safely.

### 1. Isolation Box

- a. Use a cardboard box of the appropriate size for the area to be sprayed. The walls should be high enough to contain any errant spray. Open both ends of the box, then place the box over the location to be sprayed, being sure to exclude desirable plants and/or locations.
- b. Spray the herbicide mix on the plants inside the area of the box.
- c. Allow the herbicide several minutes to dry before removing the box.
- d. Repeat for other locations as needed.
- e. Dispose of the box after any spray has dried.



### 2. Focused Spray Weed Cone

- a. Use a Styrofoam cup with a small hole cut into the center of the bottom.
- b. Remove the tip of the nozzle from the sprayer and slide the Styrofoam cup over the nozzle attachment point. Screw the nozzle tip back on.
- c. Hold the sprayer and cup close to the weed of choice and gently spray herbicide onto the leaves.
- d. Repeat for additional weeds as necessary.
- e. Remove the Styrofoam cup and dispose of it.



the leaves with one hand while painting on the herbicide, if desired.

- c. Alternatively, wear an absorbent glove over a waterproof rubber glove. Dip your thumb and forefinger in the herbicide solution, and gently stroke the weed leaves, applying herbicide.
- d. Dispose of the paint brush appropriately.
- e. Return the herbicide to its original container, unless you mixed the product from concentrate. Then be sure the secondary container is labeled with its contents, and store it with other herbicides.



### 4. Soak the Weeds

- a. Fill a well-marked glass or plastic bottle with the desired herbicide.
- b. Immerse the leaves of the weed in the solution for several seconds.
- c. Remove the leaves from the solution and allow the excess herbicide to drip back into the container.
- d. Dispose of the gloves appropriately.
- e. Return the herbicide to its original container, unless you mixed the product from concentrate. Then be sure the secondary container is labeled with its contents, and store it with other herbicides.



You must be familiar with the proper use of your chosen herbicide; read the label to determine which weeds it can be used to treat, the correct safety procedures and handling instructions, and the appropriate disposal procedures. If you have any questions about herbicide use, contact your local County Extension agent.

## Plant Profile: Geraniums

### Connie Geiger

It won't be long before we're planting annuals for summer, and geraniums are likely to be one of them for most of us. The choices come in a variety of shapes, colors and scents.

The geranium we plant in our gardens every year, and the kind found in most local stores, is actually a *Pelargonium* rather than a true *Geranium*, although both are genera in the *Geraniaceae* family. Historically, both genera have been called "geraniums".



The flowers of *Pelargoniums* have 5 petals, where the upper two petals are slightly different shape and size from the lower 3.

They have a thick succulent stem that holds moisture for withstanding drought conditions, and the seed pods have feathered ends for floating on the wind. Most of them are considered "zonal geraniums" which often have leaves with distinct zones, or bands, of color.



"True" Geraniums, also called "cranesbill," are a different genus in the *Geraniaceae* family. Wild varieties are common to North America and Europe. Their flowers also have 5 petals but they are all of the same shape and size and their seedpod structure allows the seeds to be "flung" away from the mother plant.



Note the petal arrangement.

*Pelargoniums* not really annuals, but are a tender perennial, which is why they can be successfully overwintered (more on that later). They are native to South Africa and were introduced to the western world via trade routes around the Cape of Good Hope to Europe in the early seventeenth century. As early as 1818 colonists brought scented varieties to the US as a flavoring for foods. *Pelargoniums* are famous for their scents, including mint, lemon, orange, strawberry, camphor, apricot, coconut, ginger, lime, grapefruit, nutmeg, old spice, chocolate, apple and rose. 120 different chemical constituents have been isolated from the glandular hairs on the leaves in *pelargonium* varieties.

### Growing tips:

*Pelargonium*/zonal "geraniums" are native to low-rainfall areas so they don't like excess water and humidity, though those planted in containers require more water than those planted directly in the ground. The best containers to use are clay pots that promote evaporation. Don't use a plate underneath – they like good drainage. When choosing a container, a good rule of thumb is to base it on the size of the leaves – if they're large (4-5 inches wide) pick a larger pot or whiskey barrel, small-leaved plants do best in a smaller pot. Pick a fairly sunny spot because they like at least 8 hours of sunlight per day. However, Martha Washington (Lady/Regal) varieties require cool nights (50-60 degree) in order to bloom.

If your geraniums are planted in fertile soil in the ground they may not need fertilizer, but if planted in containers its best to fertilize them a couple times during the summer.



### Overwintering:

There are several ways to keep geraniums over winter.

**Propagate from cuttings:** take 4" cutting from soft green part of a healthy terminal stem, strip off leaves from the bottom half, dip in rooting hormone and plant in vermiculite, perlite, coarse sand, or well drained potting soil. Water thor-



## Plant Profile: Geraniums

oughly and let drain, then place in plastic bag to keep air moist, place in north or east window or under artificial light. After 6-8 weeks, it should have rooted and can be planted in soil. Keep in sunny but cool spot until transferring outside.

**Dig and store in dormancy:** shake soil off the roots and remove soil clods (don't wash them). Hang upside down, or put them in a paper bag, and store in a place that stays about 50 degrees and has some humidity. Once a month soak the roots in water for an hour and return them to storage. They will lose all their leaves but the stems are alive and dormant. In March remove dead leaves and prune back to live/green stem. Pot and place in sunny location. Success of this method is dependent upon the storage humidity. Because we live in a dry climate a basement might be a better storage location than a garage or unheated room in your house.

**Bring them inside in their containers:** prune back to 1/3 its size, water thoroughly and store in cool (60-70 daytime temp, cooler at night) but well lit place – use fluorescent light close to the plant for 24 hours. In March, prune back to 1/2 or 2/3 their size.



- Cornell University Extension Service: <http://ccenassau.org/resources/-geraniums>
- <https://en.wikipedia.org/wiki/Pelargonium>
- University of Minnesota Extension Service: <http://www.extension.umn.edu/garden/yard-garden/flowers/outdoor-indoor-geranium-culture/>
- <http://faq.gardenweb.com/discussions/2766084/what-is-the-difference-between-a-geranium-and-a-pelargonium>

## Useful Links

MSU Extension Yard & Garden: <http://www.msuextension.org/category.cfm?Cid=5>

Missoula Plant Diagnostics Database: <http://www.co.missoula.mt.us/extension/plantdata/>

National Center for Appropriate Technology gardening publications: <http://www.attra.org/horticultural.html>

National Garden Association: <http://www.garden.org/>

Helena Garden Club: <http://helenagardenclub.wordpress.com/>

Lewis & Clark County Extension Office Web site: <http://www.co.lewis-clark.mt.us/index.php?id=75>

MSU Master Gardener Program: <http://www.mtmastergardener.org/>

## Contact Information

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## Gardening Calendar

### May

- ♣ Harden off houseplants and over-wintered flowers for transfer outside.
- ♣ Plant half-hardy vegetable seeds (2 weeks before last frost) - broccoli, Brussels sprout, cauliflower, and celery from transplants; potatoes from seed-pieces; and parsley and radish from seed.
- ♣ Start hardening off transplants – exposing them to outside temperatures during the day.
- ♣ Direct seed beans, seed potatoes and annual flowers.
- ♣ Remove mulches from around perennials and strawberries.
- ♣ Helena's "Average" Last Frost: May 18th (give or take 2 weeks)
- ♣ Plant corn and transplants of tomatoes, eggplant, peppers, squash, cucumbers, melons, and annuals.
- ♣ Start checking for insects such as aphids, slugs, flea beetles, and cutworms.
- ♣ Power rake, aerate and fertilize lawns.
- ♣ Prune Spring flowering shrubs after flowers fade.
- ♣ Apply compost or fertilizer to annual flower beds before planting flowers.
- ♣ Pinch chrysanthemums and annual flower plants to keep them compact and well-branched.
- ♣ Remove blossoms from newly set strawberry plants to allow better runner formation.



### June

- ♣ Spot treat lawn for broadleaf weeds.
- ♣ Water and fertilize container plantings regularly to encourage growth and flowering.
- ♣ If you haven't already; Plant lettuce greens, spinach, arugula, chard, kale and radishes.
- ♣ Cover new growth if frost suspected.
- ♣ Check soils for moisture content – if dry 2-to-3-inches down, water.
- ♣ Apply compost and fertilizer to bulbs and perennials.
- ♣ Apply foliar fertilizers in the cool of the mornings or in the evenings.
- ♣ Consider planting another row of leafy greens and radishes later in the month.
- ♣ Install or hook up drip irrigation systems.
- ♣ Install rain barrels under gutter down spouts.
- ♣ Plant perennials with a water soluble root booster to help get them established.
- ♣ Plant perennial shrubs and trees now before the heat of summer hits.
- ♣ Start watching for garden pests that require action.
- ♣ Renovate June-bearing strawberry plants after harvest drops off.
- ♣ Fertilize newly planted raspberries.
- ♣ Pinch back chrysanthemum to encourage flower budding in fall.
- ♣ Fertilize roses after first blooms; pinch spent flowers.
- ♣ Pinch back herbs to encourage more growth.



A man was driving down the road and ran out of gas. Just at that moment, a bee flew in his window. The bee said, "What seems to be the problem?"



"I'm out of gas," the man replied.

The bee told the man to wait right there and flew away. Minutes later, the man watched as an entire swarm of bees flew to his car and into his gas tank. After a few minutes, the bees flew out. "Try it now," said one bee.

The man turned the ignition key and the car started right up. "Wow!" the man exclaimed, "What did you put in my gas tank"? The bee answered:



## Ask the Experts!

We all have questions about our gardens, lawns, trees, flowers or other landscape projects from time to time. Ever wish you could ask an expert in the field for answers to your questions? Here's your chance! In each issue of the newsletter we will answer one or more questions posed by our readers. Send in your questions to [Goldcountrymastergardeners@gmail.com](mailto:Goldcountrymastergardeners@gmail.com) and we will pass the questions on to our expert panel for answers.



### Brent Sarchet, Lewis & Clark County Extension Agent

**Q:** I am new to beekeeping. Do you have some suggestions for first year beekeepers?

**A:** Beekeeping can be a very enjoyable hobby that can easily turn into a half time job if you aren't careful. The keys to successful beekeeping include some of the following:

1) **Education** – I highly encourage all new beekeepers to attend a beekeeping course if possible, own at least one resource on beekeeping (preferably one for our northern climate), and have a beekeeping mentor. If you have a local beekeeping group, attend their meetings because most of them will have education opportunities, and those meetings are great places to find a beekeeping mentor.

2). **Location** – Locate your hive in an area where it will get plenty of sun light, and keep it out of direct wind especially during the winter. Your bees should be located in an area that has many different species of plants that will flower at different times of the year. Many sites in the Helena area are deficient in species that will be flowering in the late summer or fall. If you have any threat of bears in your area, electric fence will be your friend.



3) **Varroa mite treatment** – The threshold for treating for varroa mites is 2 percent. Rarely will a hive have less than 2 percent, so in other words plan on treating for mites in the fall after honey is extracted. There are many different treatment options; become familiar with those options and understand their limitations. No treatment option is perfect.

4) **Food reserves** – Make sure the bees have enough stored food to make it through the winter. A strong hive will need at least 60 pounds of honey to make it through the winter. You can either leave that amount of honey in the hive, or you can feed them lots of sugar water prior to winter to get to that 60 plus pounds of food.



“The only time I ever believed that I knew all there was to know about beekeeping was the first year I was keeping them. Every year since I've known less and less and have accepted the humbling truth that bees know more about making honey than I do.”

— **Sue Hubbell, *A Book of Bees: And How to Keep Them***