Penn State **Extension**

The Buzz

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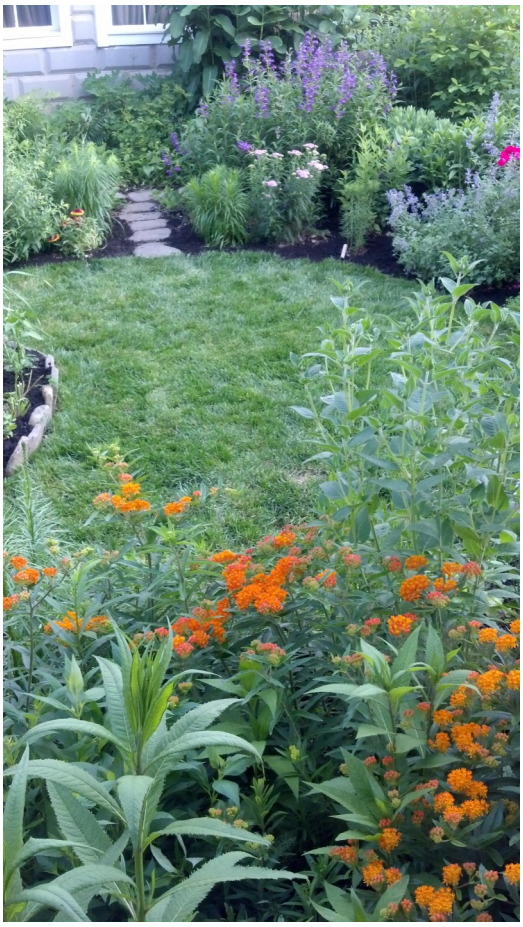
Welcome to the second certified pollinator friendly gardens newsletter. Besides our regular features on a certified garden, favorite pollinator plant and a featured invasive, the staff of the Center for Pollinator Research brings us up to date with their collaborations and plans for the Penn State arboretum.

The word about pollinators is spreading! 563 gardens in 55 counties in Pennsylvania are now certified "Pollinator Friendly". We hope to see another 100 gardens certified in 2016. As always, you can write us at papollinator@gmail.com. In your response to our first newsletter you gave us some great ideas that we will be working on for future issues.

Outstanding Pollinator Gardens

By Linda and Rich Silverman, Penn State Master Gardeners

Our second "Garden of Merit" for pollinators is the garden of Veronica Chavez. Unlike our last "Garden of Merit", Veronica's garden is in York City, a typical-size urban city garden which is anything but typical.



Veronica's Garden

The garden is a 20 ft. by 26 ft. former stone and turf inner-city backyard with a narrow strip down the length of the garage. Veronica has lived there since 2009. Over the first winter she worked on layout ideas so in the spring she would be ready to start digging.

Mostly dominated by native perennials with some herbs and vegetables tucked in here and there along stepping stone paths, plant sites include everything from dry and sunny to moist and shady. The garden uses native vines, native container plantings and vertical gardening on the fence to maximize limited space. She has also planted host plants to increase biodiversity. With 102 species of native plants and 50 different pollinators identified (excluding the nighttime visitors!), this garden is proof that if you build it they will come. It also shows that good things do come in small packages.

Veronica answered the following questions about why her garden is pollinator-certified:

1. How did you visualize your garden and why natives?

The garden needed to "work" for the small space, accommodate a future small dog, eliminate groundwater flow to the basement and be self-sustaining. By self-sustaining I mean no fuss and no irrigation except for plant establishment (and the vegetable garden). The garden needed to be full of activity and life - an oasis for our pollinators in this urban setting. Native plants were the obvious choice. Obtaining year round bloom and interest is easier when choosing native plants as well. **Continued on next page**

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2. Having an urban garden, how do you manage it in such a small space?

This is accomplished in a small space by using three approaches. First, I use the "right plant, right place" philosophy, meaning plants are placed according to their needs. Moist shade plants are planted next to the north facing garage wall, the hot dry sunny plants are placed in the sunny south-facing porch area under the roof overhang, which receives limited rainfall. In addition, I can create vertical plant layers by planting a dry shade plant in the shadow of a full sun plant. Second, I plant more closely than recommended on the plant tags and rely on what I see in nature in terms of spacing. Planting closely provides support for adjacent plants and virtually eliminated weeding as the plants block the way for weed development. I spend about a half-hour per month weeding. I give the Monardas more space as they are prone to powdery mildew and require more air circulation to control the condition.

I plant by root profile, which allows more plants per area: try placing a shallow rooted plant next to a medium or deep rooted plant to cram more plants into the same space. If something doesn't work out, I move the plant until it finds a happy location.

3. Since other homes around you have concrete or grass, have you noticed a difference in the amount of pollinators and wildlife in your garden?

Without a doubt there is far more life and activity in our yard than in neighboring yards. The difference is night and day. There are so many birds, bees, butterflies, wasps, moths, bee mimics, dragon flies and darners - even a salamander in our yard!

4. Have you had any success in changing the attitudes of the neighbors around you?

When the gas utility performed emergency work on our block, we had a choice of concrete or earth for the tiny 8x10 ft. area in front of our houses. We converted the concrete to earth. Seeing that, my adjacent neighbor ripped out her Hostas and Japanese pachysandra and said she would mirror whatever I planted so it would look like one big garden in the front of our houses. We planted mostly natives, of course. In addition, my immediate neighbors no longer indiscriminately kill bees and wasps whenever one wanders into their yard. The younger children yell for me to come outside when they see a butterfly so I can see it too.

5. What have you done to increase biodiversity in your garden? You mentioned vertical gardening.

Tragically, I ran out of space in the yard, so I started to garden vertically. We use native vines and have moved some of the vegetables to the grow boxes on the fence, thus freeing up ground space for more native plants. We have a variety of early through late season plants which helps increase biodiversity by providing year-round shelter and food sources for pollinators and birds. We don't "put the garden to bed" for the winter", we leave almost everything standing to provide insect and bird shelter, provide winter interest for us humans and provide seed heads for the birds in winter.

We are recognizing Veronica's garden as an excellent example of what can be done in a small area to help our pollinators.

More Blooms for Bees: Penn State forms a partnership with the horticulture industry to identify new pollinator-friendly plants.

By Christina M. Grozinger, Center for Pollinator Research, Penn State

To help gardeners in their quest to find the pollinator-friendly plants that can be integrated into any landscape, researchers at Penn State's Center for Pollinator Research are surveying ornamental plant species for their attractiveness and nutritional value for honey bees, bumble bees and other pollinators.

"Our goal is to cover the United States in flowering plants that support diverse communities of pollinators" says Harland Patch, research scientist and lecturer in the Department of Entomology and Center for Pollinator Research.

Penn State has joined forces with Pollinator Partnership, AmericanHort, the American Honey Producers Association, the American Beekeeping Federation and the American Seed Trade Association for this project. Bringing together such a diverse group of organizations ensures that the study will be designed so that the results can be broadly and rapidly used to help support pollinators.

The Center for Pollinator Research recently completed a survey of the largest growers of ornamental plant species in Pennsylvania, and compiled the results to identify the top-selling and most highly produced flowering plants in this region. These plant species and varietals will be used in field studies this summer, to determine which plant stocks attract the greatest numbers of pollinators (including managed and wild bees and flies) and the greatest diversity of bee species. These studies will be conducted at University Park and integrated into the Landisville Flower Variety Trials at Penn State's SEAREC. The nutritional quality of the plants' nectar and pollen will also be assessed, and including into ongoing studies at the Center which are evaluating the optimal diets for bees.

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More Blooms for Bees (Continued from Page 2)

The researchers hope that these studies will identify previously unrecognized pollinator-friendly plant species, thereby increasing the diversity of plants available to gardeners. Furthermore, this information will allow growers to adapt their management practices to reduce or alter the timing of applications of pesticides to these plant species during production, to reduce the risk to pollinators.

For more information about this study, please contact Christina Grozinger, director of the Center for Pollinator Research (cmg25@psu.edu). For more information about the Center, please visit our website (http://ento.psu.edu/pollinators). For more information about the Landisville Trial Gardens, please visit (http://trialgardenspsu.com/). This research is supported by funding from the Horticultural Research Institute and USDA-APHIS.

PROTECTING POLLINATORS

Avoiding Invasives: The Privets
Ligustrum japonicum, Ligustrum sinense, Ligustrum vulgare

By Connie Schmotzer, Penn State Extension, York

Mention privet, and my mind used to go to the carefully pruned hedge in front of my grandmother's house. These days, it conjures up a wall of green in the understory at Richard M Nixon County Park, one of my favorite places to walk. Covering a large portion of the understory of the woods there, privets have created dense stands, crowding out native plants and drastically altering wildlife habitat. Their habit of leafing out early in spring gives them a competitive advantage over native plants, decreasing the diversity of native flowers that provide nectar and pollen to different types of bees and other pollinators. Because privets come from other continents and ecosystems, very few insects are able to eat the leaves, so the forest produces fewer caterpillars and insects to feed nesting birds.

How do privets move from our yards to woodlands? Birds are the primary movers, eating the berries and flying to forested areas to deposit the seeds. Just because birds eat the berries, doesn't mean the berries are good for them. New studies show that many invasive plants lack the proper sugar and lipid content that birds need at different times of the year.

Gardeners can help by not planting privet in their yards and removing privet that might already be present. Individual plants can be dug out or cut back to the ground in late summer and the cut ends treated with an herbicide. Pick up any fruit that has fallen and place it in the garbage.

Privet Hedge in Yard

Privet Growing Wild in the Woods

OUTSTANDING POLLINATOR PLANTS

Bees, Bugs and Blooms

By Connie Schmotzer, Penn State Extension, York

Penn State Extension and Master Gardeners recently completed 3 years of a trial called Bees, Bugs and Blooms – a trial to determine the plants most attractive to pollinators. From 2012 to 2014, 84 plants and some of their cultivars were monitored for their attractiveness to a wide variety of pollinators. The results are in and we share them with you on our Pollinator Friendly Garden Certification website. Go to http://ento.psu.edu/pollinators/public-outreach/cert and click on Step 1 – Provide Food. On that page you will find a list of links. The first one, Bees, Bugs Blooms, contains our results. Check it out! We will highlight some of these plants in the next few newsletters.

Pycnanthemum muticum* – clustered mountain mint:** It seems logical to start with the plant that attracted the largest numbers of pollinators, and also attracted a huge diversity of different kinds of pollinators. With 10 weeks of bloom time, ***Pycnanthemum muticum, was constantly abuzz with insects. Bumblebees, honeybees, solitary wasps, tachinid flies, syrphid flies, beetles, and butterflies were daily visitors. Without a lot of obvious pollen, we assume the main draw of *Pycnanthemum* is its nectar. An extra bonus of *Pycnanthemum muticum* is that it also attracted some of the predators and parasitoids of the brown Marmorated stink bug.

Bee on Pycnanthemum

The leaves of this native mint have a strong mint-like aroma when crushed. The foliage is topped in mid to late summer by a bloom of tubular pink flowers. The flowers are not at all showy by our standards, but are certainly attractive to pollinators. There is a beautiful silvery cast to a mature patch of *Pycanthemum muticum.*

If you have the right conditions for this plant, we highly recommend it as a "must-have" for your pollinator garden. In natural areas, *Pycanthemum* it typically grows in grassy open places, meadows, fields, and low woodland areas. In your garden *Pycnanthemum muticum* grows best in full sun in soil that is slightly moist. It will grow in part shade and drier soils, but will not thrive there. How much it spreads depends on your site conditions. In drier, well-drained soils, it holds its place, but does not spread. In a nearby yard with moist, clay soil and full sun, it spreads rapidly by rhizomes. Pruning roots with a spade in spring will keep it in check. *Pycnanthemum's* height can vary from 1' to 3.5'.

Pollinator Trial at Penn State's Research Center near Manheim

Ladybird Johnson Wildflower Center website lists this plant as being available at Edge of the Woods Native Plant Nursery - Orefield, PA Sunshine Farm & Gardens - Renick, WV and ArcheWild Native Nurseries - Quakertown, PA.

Also check out local native plant sales in your area. Many Master Gardener groups and conservation organizations sponsor native plant sales.

Breaking New Ground at the Pollinators' Garden

By Harland M. Patch, Center for Pollinator Research, Penn State

The Pollinators' Garden at the Arboretum at Penn State is set to break new ground this year. Using plans developed by the nationally renowned landscaping design firms Oehme, van Sweden and MRT Landscaping, the current garden will expand to include a new dynamic series of gardens that will cover nearly four times as much land.

These gardens are the first of their kind to be designed using the most current scientific information. They will embody a new aesthetic where the garden is a dynamic interacting habitat for many species across seasons, not just a place for the visual display of flowers.

The surge in interest in supporting pollinator populations across the world and in our own home gardens has driven a renaissance in scientific and applied research, Penn State's Center for Pollinator Research has been a leader in this field, and worked closely with the designers. One of the main goals of the new design is to create an educational environment where the best scientific information and practices can be communicated to farmers, students, the general public, and horticultural enthusiasts.

The Pollinators' Garden will be made up of seven connected gardens, each reflecting different types of landscape for pollinators. The Meadow, Wetland and Woodland Gardens will be planted with native nectar and pollen plants to provide optimal nutrition for pollinators, as well as host plants (such as milkweed) to support the caterpillars of native butterflies species. The Evening Garden is designed to attract evening flying pollinators like moths and will be composed of the fragrant, but often colorless, flowers they prefer. The Backyard Pollinators' Garden will highlight the most suitable native and non-native plants for a domestic landscape: plants that are both showy, easy to care for, and readily obtained from local growers. There will also be demonstrations of best practices for supporting pollinators and other wildlife in the home garden.

The two final designs will be unique to the Arboretum. The Food Garden will be planted with a diverse assemblage of agricultural fruits and vegetables that depend on animal pollination services. The Research Garden will be a showcase of ongoing research at Penn State and elsewhere. It will include observation hives for honey bees, bumble bees, and nest sites for solitary bees.

The new and improved Pollinators' Garden will extend from its current location at the edge of the oval grass lawn of the Arboretum to the drive of the Schreyer House. Between the new Pollinators' Garden and the popular Children's Garden will be a future bird garden whose plans have been recently finalized.

For more information, please contact Harland Patch (hmpatch@psu.edu). If you would like to make a gift in support of the new pollinator gardens please visit www.arboretum.psu.edu

Sketch of the Pollinators' Garden at the Arboretum