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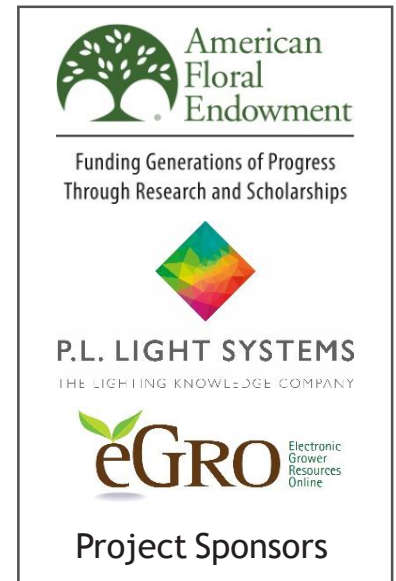
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Protecting Pollinators: What Role Can the Greenhouse Industry Play?

Co-authored by Dr. Margarita López-Urbe, Center for Pollinator Research, Penn State University

The Center for Pollinator Research at Penn State University recently released the Pennsylvania Pollinator Protection Plan (P4). P4, developed with input from twenty-eight state and national organizations and stakeholder groups, provides recommendations for best practices and resources to support and expand pollinator populations. While focused on the situation in Pennsylvania, P4 is a useful plan far beyond Pennsylvania's borders. And a close look at recommended best practices reveals that the greenhouse industry can play several very important roles in the broader efforts to protect pollinators.

The term 'pollinator' refers not just to domesticated honey bees, but also to the hundreds of other species of native bees, butterflies, moths, flies and beetles that pollinate cultivated and wild plants. Pennsylvania alone is home to more than 430 bee species, most of which are solitary and live underground. Pollinators pack a powerful economic punch. In the US, pollinators contribute approximately \$25 billion to agriculture. In Pennsylvania, their economic services to producers have an estimated economic value of \$250 million.



Populations of both wild and domesticated pollinators have been in decline in recent years. According to P4, the most important challenges pollinators face in Pennsylvania include:

- Habitat loss, degradation and fragmentation
- Pesticide use
- Pests and pathogens

Forage and Habitat: Pollinators need a number of things from the landscape in order to survive and thrive. Pollinators need places to nest and reproduce; abundant and high quality food; a consistent supply of water; and minimal exposure to pesticides as they forage. Landscapes that are pollinator-friendly provide these through elements such as soil surfaces, shrubs with pithy stems, and dead branches for nesting; a variety of plants that flower throughout the season for foraging; and water.

Pesticides: Pesticides used in both agricultural and urban/suburban landscapes, have been implicated as factors contributing to pollinator decline. These include insecticides, herbicides and fungicides. The impacts of pesticide use on pollinator populations are complex; pesticides can cause acute mortality or more subtle sublethal effects. Pollinators are often exposed to multiple pesticides which can act synergistically or additively, further diminishing pollinator health.



Pollinators need an abundant, varied, and high quality supply of food throughout the season. Does your product line help customers make their gardens and landscapes more pollinator-friendly?



Nest boxes containing stacks of hollow tubes encourage nesting of mason bees, an important native pollinator in Pennsylvania.



Gardeners in Pennsylvania can certify their gardens as "Pollinator-Friendly" through a program run by Penn State Master Gardeners.

What role can the greenhouse industry play in improving forage and habitat?

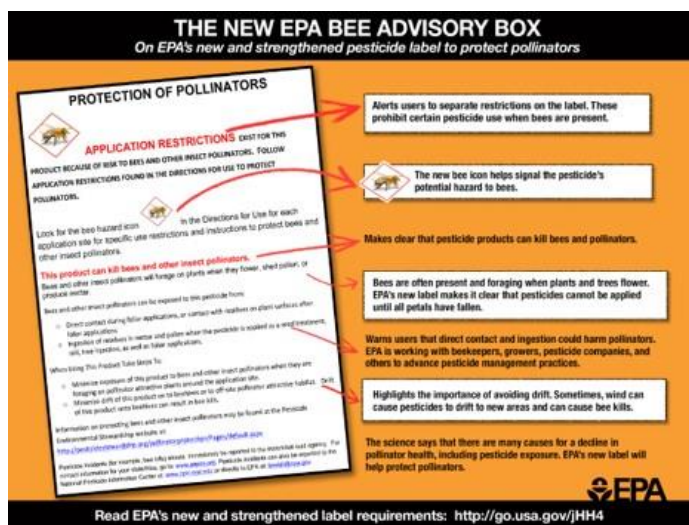
- Be knowledgeable about pollinator-friendly plants, including native plants, and practices.
- Offer and promote plants that support pollinators.
- Educate retail customers about the benefits of pollinator-friendly gardening.
- Collaborate with Master Gardeners and others who are educating the general public about pollinators and pollinator-friendly gardening.
- Promote and demonstrate bee-friendly practices such as high mowing of lawn areas, use of naturalized landscapes, and delaying winter clean-up in the landscape.

What role can the greenhouse industry play in reducing the impacts of pesticides?

- Use best practices in and around the greenhouse to reduce off-target impacts (e.g. IPM; biocontrols; cautious use of neonicotinoids; avoiding tank mixes)
- Look for the ‘bee box’ (right) on pesticide labels for additional information about how to protect bees when using particular products.
- Educate customers about proper, safe and appropriate pesticide use.
- Know where bee hives are located close to you; communicate with proprietors when applying pesticides.

Where to Find More Information:

- The Pennsylvania Pollinator Protection Plan (P4) can be found at: <http://ento.psu.edu/P4>
- Penn State Center for Pollinator Research: <http://ento.psu.edu/pollinators>
- A very useful discussion on the use of neonicotinoids in greenhouse floriculture can be found in here: <https://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/16neonicpollinatorsgh.pdf>
- Pollinator garden certification in Pennsylvania: <http://ento.psu.edu/pollinators/public-outreach/cert>



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In cooperation with our local and state greenhouse organizations



Metro Detroit Flower Growers Association

