

Encouraging Bee-Friendly Practices Helps This Important Pollinator... and OURSELVES

About a decade ago, honeybee colonies began to collapse at an alarming rate, and the world woke up to the need to protect the insect responsible for pollinating much of our food. Since then, a great deal of money, effort, and research have been devoted to helping this hard-working creature. By adopting bee-friendly policies and educating residents about pollinators, townships can do their part to ensure the honeybee keeps buzzing along.

BY AMY BOBB / CONTRIBUTING WRITER, PSATS

About 39 percent of the township is agricultural, and about 19 percent has been preserved through easements, which are held by the state or county. The township contributes funding to the county to add to its funds, and the county in turn uses the combined dollars to leverage state funds for easements on farms that do not qualify for the state program.

The township sees its contribution as an investment in the community, Petrucci says.

"We're preserving the ecosystem, retaining our pleasant, rural atmosphere, and keeping school district taxes down by limiting development that requires more resources," he says. "Farmland preservation also keeps our local taxes low because it limits the amount of infrastructure the township needs to maintain."

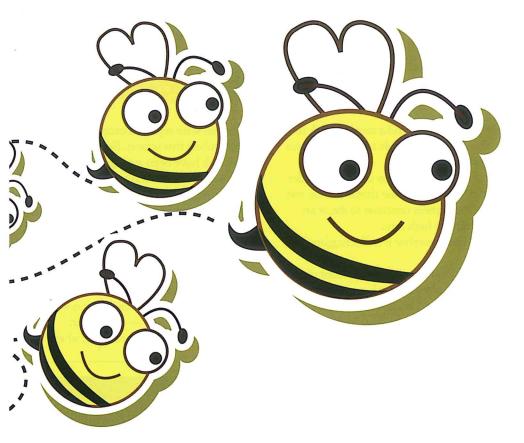
The Pennsylvania Land Trust Association suggests additional activities townships can undertake to support farmers and thus encourage the continuation of agriculture:

- Support measures to relieve the property tax burden for farmers.
- Limit the extension of sewer and water infrastructure, which encourages development, to agricultural areas.
- Permit businesses that support agricultural operations, such as farm equipment sales and service, farm supply stores, and businesses that market or process farm products.
- Allow farmers to supplement incomes through home or farm-related businesses, as well as recreational attractions, such as hayrides, corn mazes, and festivals.
- Allow and incentivize compact and higher density development in areas designated for development and where public sewer and water are available.
- Discourage road construction through agricultural areas.
- Work to improve communication and relationships between farming and non-farming neighbors.
- Allow alternatives to traditional agriculture, such as a nursery/green-house, horse farm or equestrian center, winery, Christmas tree farm, orchard, ornamental crops, or agritourism or agritainment business.



Agriculture is not only a part of Pennsylvania's heritage but also plays a significant role in many townships' character and attractiveness to residents and tourists. With farmland disappearing at the rate of an acre a minute, townships must do their part to help preserve this vital industry. By making use of the many tools available, from agricultural security areas and conservation easements to planning, zoning, and financial and other forms of support, townships can help ensure that Pennsylvania's farmland is preserved for generations to come. •





he humble honeybee. For a creature so small and modest, it sure gets a lot of attention.

The media reports on its population decline. Scientists research ways to prevent its demise. State and federal governments enact laws and regulations to protect it. Beekeepers devote time and money to keeping colonies up and running. Even municipalities are getting in on the act, passing ordinances and promoting local actions that ensure the honeybee will survive.

For anyone wondering if this is much ado about nothing, take heed: Honeybees are major pollinators, helping to pollinate about a third of the food we eat and 80 percent of the fruits and vegetables we grow.

"The honeybee is extremely important to society," Steve Repasky, president of the Pennsylvania State Beekeepers Association, says. "It's a key species in pollination efforts around the world."

From apples to melons to tomatoes, bees are the linchpin in ensuring a bountiful harvest of nutritious fruits and vegetables. In Pennsylvania, where backyards are host to both managed and wild bee colonies, municipalities play an important role in ensuring the future of these industrious pollinators. Townships can do their part by educating themselves and their residents about honeybees and encouraging practices that allow bees and other pollinators to thrive.

From how they regulate backyard beekeeping to how they manage road-

side vegetation, Repasky says, "townships can make a difference in the honeybee population and in beekeeping."

The decline of the honeybees

The plight of the honeybee came into national focus about a decade ago when beekeepers began to report unusually high losses of their hives — anywhere from 30 to 90 percent — a phenomenon that became known as colony collapse disorder. Over the years, several theories about the losses have been floated, including invasive pests, emerging diseases, pesticide poisoning,

"The fact that bees had a problem dropped them into the forefront of the media and raised concernation about their plight."



and poor nutrition.

Whatever the reason, the disorder certainly killed off a high number of bees, but it also helped to sound the alarm about the environmental dangers facing honeybees and raise awareness among the public and scientific community that pollinators needed our help.

"The fact that bees had a problem dropped them into the forefront of the media and raised concern about their plight," Repasky says.

Thanks to colony collapse disorder, the attention paid to bees resulted in more money for pollinator research, more education about bees and agricul-



Photo by Steve Repasky.

ture in schools, and a steady uptick in the number of people interested in bees and beekeeping.

These days, colony collapse disorder itself is no longer the threat it once was. Yet, honeybees continue to die at an alarmingly high rate.

"The honeybee is still struggling," he says.

Nationwide, about 40 percent of honeybees are lost each year, with Pennsylvania's numbers even higher at 55 to 60 percent, he says. In April, the Capital Area Beekeepers Association in the mid-state reported exceptionally high numbers this season. Beekeepers in the club have been averaging 75 percent losses of their colonies.

"If we continue to lose half our hives, build them back up, and lose them again, we are never going to see an upward growth in the bee population," Repasky says. "This cycle is just not sustainable."

A trend that is particularly troublesome, he says, is that colony loss is now occurring twice a year — not only in the winter but also in the summer, when



bees should be buzzing and thriving.

A small number of the 4,500 bee-keepers registered with the Pennsylvania Department of Agriculture make a living by transporting their bees on trucks to farms, both in and out of the state, to pollinate crops. However, the vast majority — about 85 percent — are backyard enthusiasts who keep bees as a hobby and to enjoy the honey their insects produce.

"We take pride in our hives and do it for the honey, the love of honeybees, and an interest in pollinators," says Repasky, who refers to himself as a "sideliner," a beekeeper who earns some money by selling queen bees, nucs (or nucleus colonies), and honey.

Of the 100 hives he manages, he loses about half of them on average annually.

"I build them back up again each year, but it's not cheap," he says.

A beekeeper starting out can easily spend \$1,000 for two colonies, plus the additional costs for replacement bees and medication to treat the insects for parasites.

"Beekeepers are constantly putting money into their work," he says. "They do it because they love it, not to get rich at it."

To illustrate his point, he shares a joke making its rounds of the beekeeping world: "How do you make a million dollars in beekeeping?" he asks. "Start out with \$2 million."

Researching pollinators

Honeybees are not native to our continent. They were first introduced by Europeans arriving to the New World in the 1600s.

"The honeybee is an important bee, but it's not the only pollinator," says Connie Schmotzer of the Penn State Extension's Master Gardener Program in York County. "Native pollinators have been here and have helped to keep our agriculture going."

In fact, Pennsylvania has close to 400 species of native bees, as well as flies and beetles, that all help with pollination, she says, and like honeybees, many of these species are also on the decline.

Honeybees became the most visible and recognizable pollinators because they are easily managed or farmed by man, says Margarita López-Uribe, an assistant

Getting to know the HONEYBEE

Many of the clashes that communities experience over honeybees can be linked to misinformation about the insect. Townships can help to clear up some of these misunderstandings by sharing the truths about this important pollinator.

One of the biggest misconceptions about honeybees is that they will sting and be aggressive. That's just not true, says Steve Repasky, president of the Pennsylvania State Beekeepers Association.

"The honeybee is docile and has no reason to sting unless it is defending its hive," he says, noting that people tend to fear all stinging insects once they have been stung by a wasp or a yellow jacket. "Wasps and yellow jackets are the more aggressive bee and will sting more readily."

Unlike yellow jackets or wasps, which can sting multiple times, honeybees usually die when they sting us (because they leave their barbed stinger behind in our skin) so they are genetically predisposed to avoid doing so.

Repasky says he also sometimes hears concerns about allergies to bee stings.

"The true meaning of 'allergic' is going into anaphylactic shock where your blood pressure drops and your airways narrow, and that can be very dangerous," he says, "but what most people experience when stung by a bee is redness, swelling, and itching, all normal reactions to a bee sting."

Another misconception about honeybees is that a colony containing tens of thousands of bees will swarm and be a nuisance.

"People picture a big cloud of bees going out to gather pollen, but it doesn't happen like that," he says.

Only about 10 to 15 percent of the bees in a colony leave the hive to forage for nectar and pollen; the remainder stay behind to tend to the hive.

"You probably won't even notice the bees as they move among flowers and plants and their hives," he says. "They are very passive and non-aggressive."

Honeybees do increase their colony numbers by swarming, sometimes flying several miles to establish a new colony, but that's a good indicator of a healthy colony of bees. The swarm will typically settle on a branch for a day or two until the scout bees find a suitable home, usually in the hollow of a tree.

When Repasky gets calls about swarms, he uses it as a teaching moment to show how docile honeybees are. He will show up without a protective suit and move around the swarm without getting stung.

He first tries to educate the homeowner about what is occurring and why allowing the bees to resettle on their own is good for the local environment. If that fails, he will remove the branch, place it in a box, and relocate the bees to his or another beekeeper's property.

In either case, he likes to leave a jar of honey with the homeowner as a token of good will from the bees.





















professor of entomology at Penn State.

"We know how to provide nesting and get products from the honeybee," she says, "so it has become the numberone bee species for pollination."

Because we know so much more about managed honeybees, their problems and treatments can be more readily studied and observed. This knowledge provides invaluable insight into the risks facing all pollinators.

Researchers investigating the causes of decline in bee populations have identified the following stressors, which Repasky refers to as the four P's:

1) Poor nutrition — Changes in the landscape, such as fewer farms, less-natural areas, and more development, have diminished the diversity of flowering plants. Because bees have lost

"There's just not much out there for them to eat so they don't get the diverse pollen and nectar they need."

access to a wide variety of food sources, their nutrition is not as optimal as it was decades ago.

"There's just not much out there for them to eat so they don't get the diverse pollen and nectar they need," says Schmotzer, who compares it to humans eating only hot dogs. "It's just not healthy."

2) Pesticides — The overuse and improper use of herbicides and insecticides, especially over-the-counter varieties, has contaminated the bees' food and poisoned their population.

While pesticides have their place, Repasky says, "Too many people apply them too liberally or don't follow proper application directions."

3) Pathogens — Bees made unhealthy from poor nutrition and insecticide exposure are more likely to succumb to bacterial diseases and viruses.

"Combining a less than optimal diet with contaminated food weakens the

bees' immune system, and they become vulnerable to a variety of illnesses and parasites," López-Uribe says.

4) Pests and parasites — A constant threat to bees over the past few decades is the variety of mites and beetles that infect colonies and become resistant to treatment. Keeping these pests away from colonies requires diligence on behalf of the beekeepers, who must treat the bees to help prevent pests. Beekeepers that don't follow good management practices risk spreading parasites and infecting other colonies, López-Uribe says.

"Keeping bees is like having a domestic animal at your home," she says. "You need to take care of them, feed them well, and treat them for parasites."

The good news for bees is that despite these dangers, a lot of people, from researchers to the government to the public, want to help them thrive.

"Scientists and the general public



A POLLINATOR-FRIENDLY **GARDEN: A carefully** crafted garden that provides habitat and food for pollinators can be just as beautiful and inviting to humans. "There is a lot that can be done to humanize a landscape," says **Connie Schmotzer of Penn** State Extension, Grass paths and beds lined with edging are some of the techniques master gardeners will employ to create a garden that is appealing to homeowners, neighbors, and bees alike. (Photo by Connie Schmotzer.)

SOME MORE WAYS TO HELP BEES

Give honeybees a helping hand



- Buy local honey and support a local beekeeper.
 - · Plant a pollinator-friendly garden.
 - · Use pesticides sparingly.
- Learn more about where your food comes from and the important role pollinators play.
- Consider becoming a beekeeper yourself.





Become a bee-friendly community

Townships that encourage beekeeping and provide hospitable habitat for bees can apply to become a Bee Friendly PA community under an initiative by the Pennsylvania State Beekeepers Association.

Townships may submit applications that show their beefriendly efforts in the areas of legislation, education, pest management, pollinator-friendly green space, and community support.

More information is available at www.beefriendlypa.org.

Check out these pollinator resources

- Department of Agriculture, www.agriculture.pa.gov (click on "Plant Industry" under "Protect" at the top of the page and then choose "Apiary and Pollinator Services" under the "More Information" listing)
- Pennsylvania State Beekeepers Association,

www.pastatebeekeepers.org

Penn State's Center for Pollinator Research,

http://ento.psu.edu/pollinators

• Penn State Extension, http://extension.psu.edu



"Townships can make a difference in the honeybee population and in beekeeping."



are now heavily vested in bees and are interested in helping them," she says.

At Penn State University, the Center for Pollinator Research has been developing strategies to reduce the environmental stressors affecting bees. Christina Grozinger, the center's director, lists the following initiatives by researchers:

- Working with growers to control pests through decreased use of pesticides or to apply pesticides in a manner less harmful for bees.
- Studying the nutritional requirements of bees and developing planting recommendations for a variety of landscapes.
- Evaluating how to reduce Varroa mite populations in honeybee colonies

with the least negative impact on bees.

• Evaluating how differences in land use and management practices influence honeybee health and how improved landscapes can support healthier bee populations.

Research into honeybees and other pollinators is going strong, but getting the findings and other useful information into the hands of the public remains a challenge, Schmotzer says.

To help remedy this, the Center for Pollinator Research has been working with the state Department of Agriculture and other government agencies and stakeholder groups to develop a Pollinator Protection Plan for Pennsylvania. The comprehensive guide, which is expected to be released this summer, will provide strategies for supporting pollinators in urban/surburban, agricultural, and natural landscapes. (See the sidebar on the next page for more information about this state plan and other research projects.)

Stirring up a hornet's nest

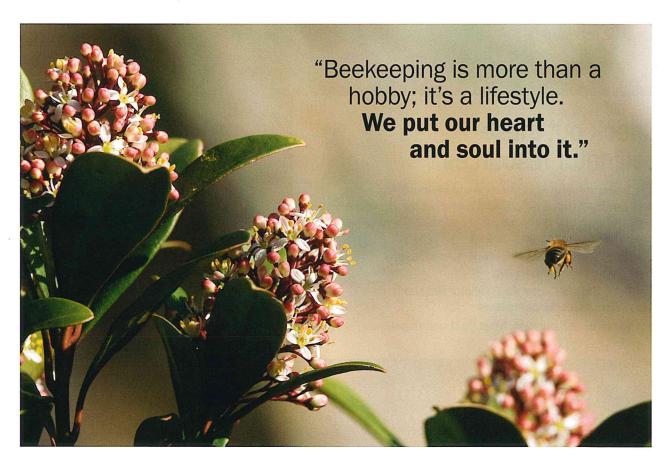
Support of pollinators often starts through education and a basic understanding of the value of the honeybee, something Millcreek Township in Erie County found out in the summer of 2015 when the zoning hearing board began exploring whether beehives should be permitted on a residential property. The township soon discovered it was about to stir up the proverbial horner's nest.

The issue started innocently enough when a resident complained that bees coming from three hives on a neighbor's property were visiting his pool. Without specific regulations governing bees, the township notified the beekeeper that her bees just might be an agricultural use prohibited in a residential zone. The issue went before the zoning hearing board.

"Well, we caught all kinds of grief," Millcreek Township supervisor Brian McGrath recalls. "All kinds of people came out to the zoning hearing board meeting to tell us that bees were endangered and to leave the bees alone."

In the end, the zoning hearing board decided that beekeeping was a hobby, much like backyard gardening, and the bees could stay. The hives were moved closer to a pond on the property to discourage them from seeking out the neighbor's pool for water.

"The issue died down after that,"



says Charlie Pierce, the township's zoning officer.

He credits Steve Repasky of the Pennsylvania State Beekeepers Association, who came to the meeting, with enlightening the community about the importance of honeybees and beekeeping.

"We were wowed by the information he gave us," he says. "It sure turned a lot of heads to the fact that bees are beneficial and do a lot of good things for people."

The township briefly kicked around the idea of an ordinance providing some rules on beekeeping, but it ultimately decided against it, a decision that Repasky says most beekeepers would prefer.

"When it comes to honeybees, the best local regulation is usually no regulation," he says. "Bees have no negative impact on their environment or the people around them."

If a township decides to pursue regulations on backyard beekeeping, Repasky suggests calling upon the expertise and knowledge of the Pennsylvania State Beekeepers Association to help draft an ordinance that meets the needs of both beekeepers and concerned neighbors.

"We are the experts," he says. "We can help craft language that will hold up in law, not make it too restrictive to beekeepers, and make sure the folks in a neighborhood feel comfortable, too."

About four years ago, the association worked with Findlay Township in Allegheny County on such an ordinance after a resident raised concerns about beehives on a neighbor's property.

"They were fearful that their children would be stung," township manager Chris Caruso says. "Because of information the beekeepers association provided, we learned that honeybees are not the bees we have to worry about."

With the association's input, the township enacted rules designed to head off future clashes between neighbors over bees. Under the ordinance, beehives are permitted in any district — keepers only have to obtain a free permit from the township — but they can only be located in the backyard (except in an agricultural district), at least 10 feet away from the property line,

Pollinator research contributes to the protection and understanding of bees

Hundreds of thousands of dollars are spent around the state in the name of pollinator research and protection. Here's a brief look at a few of these programs and research projects:

• **Apiary Inspection Program** — The state Department of Agriculture is charged with administering the Bee Law, passed in 1994, which requires all apiaries in the state to be registered.

The program regulates the movement of honeybees, queens, and used equipment into and out of Pennsylvania to mitigate bee disease outbreak and provide for quarantine when potentially threatening pests, pathogens, and parasites are discovered. State inspectors are sent out to inspect colonies during the active bee season.

• **Pollinator Protection Plan** — The state Department of Agriculture has joined forces with growers, beekeepers, researchers, government agencies, and other stakeholders to develop a state plan that aims to protect pollinators.

Penn State's Center for Pollinator Research has taken the lead in compiling the report, which is scheduled to be released this summer. The comprehensive guide will provide strategies for supporting pollinators in urban/suburban, agricultural, and natural landscapes.

- **Pennsylvania Native Bee Survey** Started in 2006, the survey by the Apiary Section of the Department of Agriculture identifies native pollinators in the state. The survey provides a baseline to analyze changes in bee populations over time.
- Landscapes for Bees This project, led by Penn State's Center for Pollinator Research in conjunction with beekeepers across Pennsylvania and the eastern United States, attempts to assess the impacts of a wide variety of landscapes, including urban, agricultural, and undisturbed, on colony health, survival, and productivity. The results will help land managers, growers, and beekeepers find and create optimum resources for bees.
- Feral Honeybee Health This new project, also by the center, aims to test whether feral honeybees have stronger immune systems than their managed cousins.
- Pennsylvania Queen Bee Improvement Program The goal of this Pennsylvania State Beekeepers Association project is to develop or breed honeybees that are: 1) resistant to Varroa mites and brood disease without requiring much, if any, treatment; 2) hardy with at least an 80 percent survival rate over winter; and 3) gentle creatures that produce honey.



Honeybee research that is occurring around the state focuses on improving the health of colonies and breeding hardier bees. (Photos by Nick Sloff, Penn State.)

CAN YOU SPOT THE QUEEN BEE IN THE PHOTO BELOW?

(**Hint:** It's slightly longer with less distinctive striping and likes to be front and center.)

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HELPING THE HONEYBEE

and with some kind of barrier, such as a hedge row or fence, to separate the bees on the neighbor's side.

"The situation taught everyone a lot about bees and how they are intertwined with our environment, how critical their pollination is to our survival, and even how ingesting honey with local pollens can help reduce allergies," Caruso says.

Tips for helping bees

Once skeptics learn about the positives surrounding honeybees and other pollinators, many become advocates for this hard-working creature so vitally linked to a healthy ecosystem.

Here are some tips for how townships can become better bee advocates:

Help to dispel myths about bees
 Townships can share information about honeybees and the need for pollinators in their newsletters and on their websites.

One of the biggest misconceptions about honeybees is that they will sting and be aggressive. Repasky believes a fear of bees can usually be traced to a memory of being stung by a bee, most likely from the more aggressive wasp or yellow jacket.

"The honeybee is docile and has no reason to sting unless it is defending its hive," he says. (See the sidebar on page 23 for more truths about the honeybee.)

• Encourage, rather than restrict, beekeeping — Only pass ordinances that are conducive to beekeeping, Repasky says, or better yet, stay away from local restrictions altogether. If your township ultimately decides it wants to regulate beekeepers, contact the Pennsylvania State Beekeepers Association for help.

The association has a model ordinance that addresses flight paths

Other bees important to Pennsylvania agriculture

Believe it or not, there are approximately 4,000 described bee species in North America, including 300 to 400 native species in Pennsylvania. Here's a look at some of the other more common and useful bees in our state:

Bumblebee — Considered the second most important pollinator after the honeybee, these large-bodied bees are efficient pollinators of crops not frequented by honeybees.

Sweat bees — Most species of this small bee are solitary, and a few are attracted to the salts in human sweat.

Leafcutter bees — Females of this solitary species frequently nest in rotting wood and line the interior with small pieces of leaves. Unlike most bees that carry pollen on their hind legs, the leafcutter bee transfers pollen on the underside of its abdomen.

Squash bees — An efficient pollinator of squash and related crops, this solitary, ground-nesting species will visit flowers at temperatures and under light conditions unsuitable for most other pollinators.

Mason bees — Prized for their efficient pollination of orchard crops in the spring, this species has been successfully managed by providing nesting boxes or tubes.

Mining bees — These solitary bees excavate pencil-thin nests in the ground and are among the first bees to emerge in the spring.

Source: Penn State College of Agricultural Sciences, Agricultural Research and Cooperative Extension















of bees and setbacks of colonies from property lines and pools without being too restrictive. Ordinances should also encourage beekeepers to register with the state Department of Agriculture and follow the best management practices advocated at the state level to protect their colonies from disease and parasites.

• Support pollinator-friendly landscapes — Townships can help bees and other pollinators by cutting back on the use of pesticides and herbicides in public parks and along roads and encouraging natural areas with diverse native plants that attract pollinators.

"Plants that are good food sources for bees are often at odds with local laws promoting green lawns and regulating weeds," López-Uribe of Penn State says. "Historically, what we have done with our landscapes is not good for pollinators. We need municipalities to start thinking about pollinators when enacting regulations."

Schmotzer of the extension's Master Gardener Program would like to see ordinances that encourage landscapes to have less grass that needs to be







mowed and more trees, shrubs, and native plants that can be left natural. Beds with less mulch and more leaves and dead wood left in place can provide valuable habitat for wild bees and other insects. Even detention basins could be planted with native trees and flowering perennials, she says, to make them attractive to pollinators.

Getting townships and residents to

rethink how they view landscapes will be challenging.

"The lawns and foundation plants we typically see around today were okay in the 1950s, when we had more natural areas," Schmotzer says, "but those areas have shrunk or become overrun by invasive species."

What is needed are landscapes dominated by diverse and native plantings that will reseed, grow tall, and move around, such as milkweed, wildflowers, clover, and dandelions, all plants that are commonly viewed as weeds.

"They are beautiful in their own right, but they're not the marigolds that people are used to," she says.

In a world where it's sometimes difficult for individuals to feel they are making a difference, she notes, "this is one of those areas where we can."

It starts in our townships and in our backyards, she says. "We need to make our yards and our common areas conducive to pollinators once more."



Last year's state Honey Queen demonstrates that there is nothing to fear from honeybees. Despite being cloaked in hundreds of bees, she was NOT stung. (Photo by Steve Repasky.)

"The honeybee is docile and has no reason to sting unless it is defending its hive."

