

<http://www.xerces.org/bringbackthepollinators/>  
<http://www.bumblebeewatch.org>

## Xerces Society: Bring Back the Pollinators

### 1. Provide wildflowers for pollinators

Bees, butterflies, and other pollinators need access to abundant nectar and pollen resources throughout the growing season. At minimum, strive for three species to be blooming at any one time; the greater the diversity, the better. The links below will help you find the best plants for your garden. It is important to include flowers that bloom early in the spring to provide food for newly emerging bumble bee queens. Similarly, it is important to provide flowers that bloom in the late summer and fall to support new bumble bee queens for overwintering.

### 2. Provide nest sites for pollinators

Bees, butterflies, and other beneficial insects need access to safe places to nest, lay eggs, and raise their young. Insects also need sheltered, undisturbed places to hibernate and overwinter. The easiest way to provide these nesting resources is by benign neglect and by recognizing, protecting, or adding to the resources already available.

### 3. Protect Pollinators from Pesticides

Pesticides are not just a problem on agricultural lands. More pesticides are applied per acre in urban neighborhoods than on farmland. Exposure to pesticides can directly kill pollinators or impair their ability to fly, navigate, or forage for food. Pledge to stop using pesticides and encourage your neighbors to join your effort in creating a pollinator-safe community.

Neonicotinoids are a group of insecticides that are used widely on farms, as well as around our homes, schools, and city landscapes. Used to protect against sap-sucking and leaf-chewing insects, neonicotinoids are systemic, which means they are absorbed by the plant tissues and expressed in all parts, including nectar and pollen. Unfortunately, bees, butterflies, and other flower-visiting insects are harmed by the residues. Extremely concerning is the prolific inclusion of these insecticides in home garden products. Home garden products containing neonicotinoids can legally be applied in far greater concentrations in gardens than they can be on farms – sometimes at concentrations as much as 120 times as great which increases the risk to pollinators. As a gardener, you have a unique opportunity to help protect pollinators by avoiding the use of these insecticides, asking your local nursery or garden center if plants have been treated with neonicotinoids, and encouraging your city or park district to use alternatives to neonicotinoids on plants that are visited by bees or are bee-pollinated. Learn more about neonicotinoids and the brand names of common garden products that contain these chemicals [here](#).

### 4. Let people know you're providing habitat for pollinators.

## Examples of Neonicotinoid Garden Products Used in the United States

Neonicotinoid	Garden & ornamental uses	Garden product trademark names
Imidacloprid	Foliar spray for turf and ornamental flowers, trees, and shrubs; soil drench for garden fruits and vegetables, and ornamental flowers, trees, and shrubs; trunk injection for trees; granules for turf and ornamental flowers, shrubs, or trees.	Bayer Advanced 3-in-1 Insect, Disease, & Mite Control Bayer Advanced 12 Month Tree & Shrub Insect Control Bayer Advanced 12 Month Tree & Shrub Protect & Feed Bayer Advanced Fruit, Citrus & Vegetable Insect Control Bayer Advanced All-in-One Rose & Flower Care concentrate DIY Tree Care Products Multi-Insect Killer Ferti-lome 2-N-1 Systemic Hi-Yield Systemic Insect Spray Knockout Ready-To-Use Grub Killer Monterey Once a Year Insect Control II Ortho Bug B Gon Year-Long Tree & Shrub Insect Control Ortho MAX Tree & Shrub Insect Control Surrender Brand GrubZ Out
Clothianidin	Granules for turf, and ornamental flowers, shrubs, or trees.	Bayer Advanced All-in-One Rose & Flower Care granules Green Light Grub Control with Arena
Thiamethoxam	Foliar spray for turf and ornamental flowers, trees, and shrubs; granules for turf and ornamental flowers, trees, and shrubs.	Amdro Quick Kill Lawn & Landscape Insect Killer Amdro Rose & Flower Care Maxide Dual Action Insect Killer
Acetamiprid	Foliar spray for garden fruits and vegetables, and ornamental flowers, trees, and shrubs.	Ortho Bug B Gon Garden Insect Killer Ortho Bug B Gon for Lawns Ortho Flower, Fruit and Vegetable Insect Killer Ortho Rose and Flower Insect Killer Ortho Rose Pride Insect Killer
Dinotefuran	Granules for turf and ornamental flowers, shrubs or trees, soil drench for ornamental flowers, trees, and shrubs.	Green Light Tree & Shrub Insect Control with Safari 2 G Safari Ortho Tree & Shrub Insect Control Plus Miracle Gro Plant Food



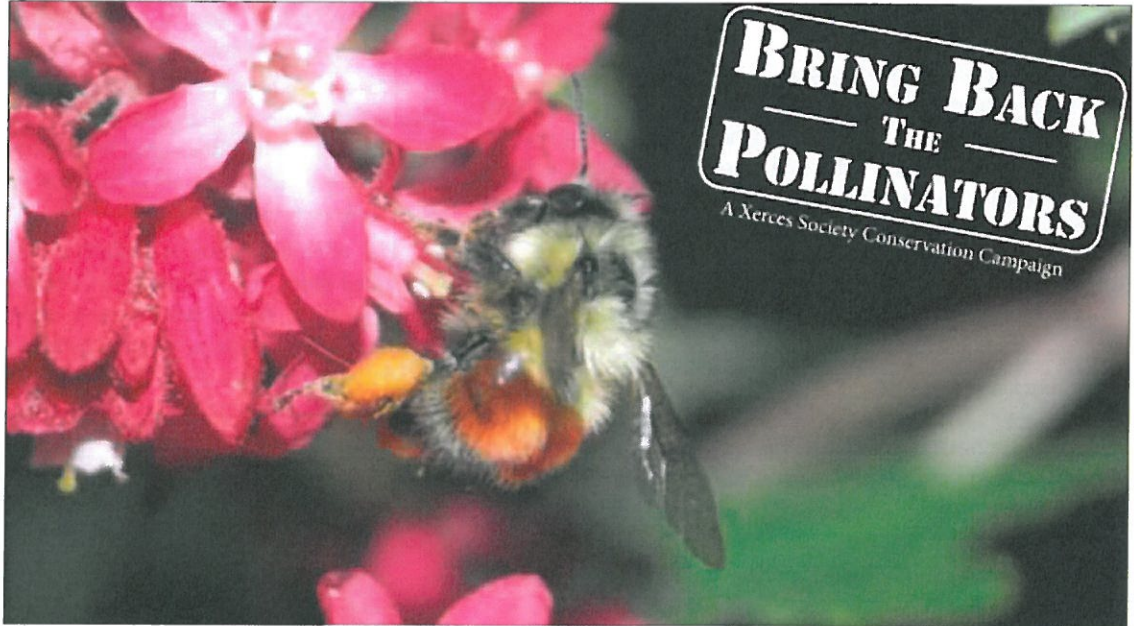
# Pollinator Conservation

## Three Easy Steps to Help Bees and Butterflies

Pollinators are vital for both wildflowers and crops. Without them, about 85% of plants would be unable to produce seeds or fruit.

Changes in our landscapes have contributed to declines in both managed honey bees and wild native bees.

There are simple steps that you can take to support bees and other pollinators wherever you live.



Photograph by Mica Vaughan/The Xerces Society

Bumble bees are one of the most important pollinators of our native plants and crops.

Pollinators are essential to our world. Bees, butterflies, hummingbirds, moths, wasps, flies, beetles, even a few bats are some of the animals that move pollen between flowers, enabling them to produce seeds.

The ecological service these pollinating animals provide is necessary for the reproduction of over 85% of the world's flowering plants. The resulting seeds and fruits provide food for countless other animals ranging from songbirds to grizzly bears.

Pollinators are also essential to human life. Consider for a moment that approximately one in three mouthfuls of food and beverage required the presence of a pollinator. The United States alone grows more than a hundred crop plants that need pollinators. With-

out pollinators, there would be no apples, pumpkins, blueberries, or many other fruits and vegetables. Only wind-pollinated crops such as corn and wheat would remain.

Bees are the primary pollinator for most wildflowers and crops in the United States and Canada. Worldwide, there are an estimated 20,000 species of bees, with approximately 4,000 species native to North America. The non-native European honey bee is the most common domesticated pollinator in the United States. However native pollinators are often adapted for specific plants, resulting in more efficient pollination and the production of larger and more abundant fruits and seeds.

### Pollinators at Risk

In many areas pollinators are in decline. The loss of honey bees due to pests, diseases, and other factors has been widely publicized in recent years.

While the loss of honey bees is alarming, many of our wild native bees are also disappearing. For example, in the mid-1990s, the yellow-banded bumble bee was the most abundant bumble bee in northern Wisconsin. Ten years later it made up less than 1% of the

state's bumble bees. Across the continent in Oregon, Franklin's bumble bee has likely gone extinct during the same period.

Pollinators are a keystone species group; the persistence of a large number of other species depends upon them. As pollinators disappear, the effect on the health and viability of crops and native plant communities can be disastrous.



The Xerces Society  
for Invertebrate  
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## Three Steps To Help Pollinators

Protecting, enhancing, or providing habitat is the best way to conserve pollinators. Whether you tend a small flower box in the city or maintain a large rural garden, there are practical steps you can take to improve the health, abundance, and diversity of your local pollinators.

### Create a Diversity of Bloom

Bees, butterflies, and other beneficial insects need abundant nectar and pollen sources throughout the growing season. Select native plants wherever possible. Cultivate a landscape with diverse flower colors, shapes, and bloom times. Try to provide blooming plants from early spring to fall, with at least three species of flower in bloom each season. Note that some ornamental plants have been selected for traits that are attractive to people, rather than pollinators. Avoid pollenless cultivars and double-petaled varieties of ornamental flowers.

### Protect Nests and Egg-Laying Sites

Native bees use untidy areas of the garden to nest such as open sandy ground, brush piles, and old tree stumps and snags. Consider leaving some of these for wildlife habitat. Supplement nesting opportunities with mason bee houses or bundles of hollow plant stems.

Butterflies often need specific host plants to feed on during their caterpillar stage. For example the caterpillars of monarch butterflies feed exclusively on the leaves of various milkweeds. Protect or plant the host plants of butterflies native to your area.

### Don't Use Pesticides

Pesticides can be important tools for protecting crops and controlling invasive species, however most lawn and garden pest problems can be solved without such chemicals. Keep in mind that even "organic-approved" insecticides can harm pollinators and other wildlife.

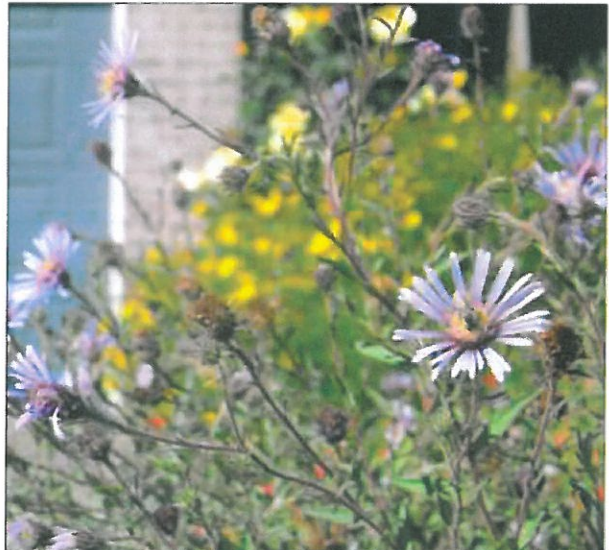
Herbicides, while usually not directly lethal to insects, can reduce plant diversity, including the diversity of weedy, noninvasive wildflowers that provide essential pollen and nectar for bees, butterflies, and hummingbirds.

## Learn More

The Xerces Society is an international nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat. Visit our Pollinator Conservation Resource Center, at [www.xerces.org/pollinator-resource-center](http://www.xerces.org/pollinator-resource-center), to find where you can purchase regional wildflower

## Bees at a Glance

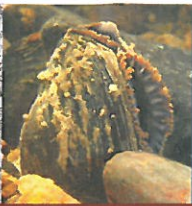
- Unlike honey bees which form large social units, the majority of our native bees live as solitary individuals, with each female constructing her own nest. She collects nectar and pollen to provision it with food for her offspring. The only native bees to form social colonies are bumble bees and a few species of sweat bees.
- Most native bees are usually very gentle and unlikely to sting unless grabbed or stepped on. Only honey bees, bumble bees, and a few of the social wasps such as yellowjackets (which are not significant pollinators) are likely to sting when their nests are disturbed.
- The economic value of pollinator-dependent crops in the United States was estimated to be between \$18 and \$27 billion in 2003. If this calculation is expanded to include indirect products, such as the milk and beef from cattle fed on alfalfa, pollinators may be responsible for more than twice this dollar amount.



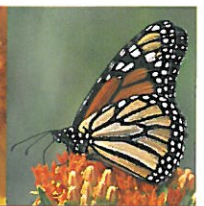
A pollinator garden can be developed anywhere. Plant it with a diversity of flowers that together provide bloom from early spring to late summer, and you will create a valuable resource for pollinators. Photograph by Matthew Shepherd/The Xerces Society.

seed mixes, and buy a copy of *Attracting Native Pollinators*. *Protecting North America's Bees and Butterflies*. Together these resources provide complete guidance on selecting appropriate plants, creating nests, managing habitat, and understanding your local bees.





# THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION



Protecting the Life that Sustains Us

*An international  
nonprofit organization  
that protects wildlife  
through the conservation of  
invertebrates and their habitat*

April 28, 2014

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Mr. Doug McKalip  
Senior Policy Advisor for Rural Affairs  
White House Domestic Policy Council

Dear Dr. Stebbins and Mr. McKalip:

On behalf of the many thousands of stakeholders and conservation partners we represent, thank you for your interest in pollinators. The White House has an unprecedented opportunity to advance public education and provide leadership in the conservation of bees, butterflies, and the other pollinating animals that sustain our world.

We recognize that ongoing reports of honey bee decline are driving much of the interest in pollinators today. However, less well known but far more alarming, is the growing body of evidence suggesting that wild bees and other pollinators are faring even worse.

For example, a recent analysis conducted by researchers from across North America now reveals that one-third of the 46 bumble bee species found in the United States are at risk of extinction. Similarly, as the White House already knows, precipitous declines of the once ubiquitous and iconic monarch butterfly represent a shocking trend as the population dwindles to record lows.

Yet even as these declines are taking place, pollinator-dependent crop acreage has grown three-fold over the past 50 years and new research is clearly demonstrating that our wild pollinators are far more important than we previously understood.

In 2013, the journal *Science* published the most comprehensive study of its kind showing that:

- Wild bee species are significantly more effective crop pollinators than honey bees on a bee-for-bee basis, and
- Crop yields are significantly higher when wild bees are integrated into farm systems.

The 40 authors of this research article identified wildflower-rich habitat on farms and more careful use of insecticides as the critical links necessary to support these wild bees.

In the absence of existing wildflower-rich habitat, restoring habitat on farms is widely recognized as the best practice for increasing native bee populations, and is important for improving

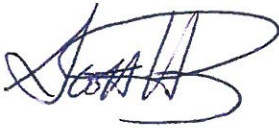
the health of honey bees. This approach ensures a stable supply of nectar and pollen throughout the growing season, even when bee-pollinated crops are not in bloom.

When combined with measures to reduce pesticide use, the best available science (and our direct experience working with farmers nationwide) clearly demonstrates that habitat restoration can sustain the wild bees necessary to pollinate our crops and rebuild a robust and healthy beekeeping industry. While multiple and complex factors are likely driving the decline of our pollinators—including habitat alteration, pesticide use, parasites and diseases, and, perhaps, climate change—habitat restoration with native plants is a key strategy that can buffer bee populations against the multitude of threats that they face.

The Xerces Society manages the largest pollinator conservation program in the United States, with multiple staff biologists supporting farmers and agencies like the USDA Natural Resources Conservation Service on projects that span the country. Our work is increasingly recognized internationally by organizations such as the Food and Agriculture Organization of the United Nations, the International Union for Conservation of Nature, and by members of the business community, including General Mills and others, as setting the global standard for effective, science-based pollinator conservation. We are pleased to offer this experience to you, and we welcome any opportunities to help the President and the staff of the Office of Science and Technology Policy and the Office of Rural Affairs succeed in leading a new era in pollinator protection.

We commend your office for bringing new attention to this extremely important issue, and are committed to making pollinator conservation a legacy achievement for the President.

Respectfully yours,

A handwritten signature in blue ink, appearing to read "Scott Hoffman Black". The signature is stylized and cursive, with a large initial "S" and "H".

Scott Hoffman Black  
Executive Director

On the following pages we address the questions posed in the meeting invitation.

### **1. What activities, policies, or other initiatives could Federal agencies enact with existing resources to address pollinator health?**

Several Federal agencies and programs are already providing excellent support for pollinator conservation, and are poised to do more:

#### **USDA NRCS and FSA**

The USDA Natural Resources Conservation Service (NRCS) and Farm Services Agency (FSA) have led the Federal government's most successful pollinator conservation efforts since the 2008 Farm Bill first made pollinators a priority for the department. In the past 5 years, working with farmers and NGOs, the NRCS and FSA spearheaded the restoration of more than 120,000 acres of wildflower-rich habitat on working farms across the U.S. To build on this record of accomplishment, we make the following recommendations:

- Continue to empower NRCS and FSA in their efforts to restore pollinator habitat.
- Recently, the NRCS launched a special initiative to restore honey bee habitat to the Upper Midwest.
  - While the effort was successful in raising awareness and incentivizing quick measures like the planting of flowering cover crops, future efforts could focus on long-term, wildflower-rich native plant restoration and be expanded to include additional states.
- The NRCS could collaborate with the FSA to launch a special "Monarch Butterfly Recovery Initiative" that would focus agency resources on mitigating the large-scale loss of milkweed plants across the monarch's migration corridor, with an emphasis on the most significant breeding areas.
  - The NRCS has already funded a seed industry-NGO partnership to increase the commercial availability of milkweed seed for habitat restoration. Incentivizing landowners to plant that seed through programs such as EQIP, CSP, CRP, and CREP is the next logical step. Not only will this restore milkweed, it will bolster the market for native milkweed seed, which will ultimately reduce seed costs.

#### **Federal Lands**

Public land managed by the Forest Service, Bureau of Land Management, and Fish and Wildlife Service all provide essential habitat for some of the nation's most sensitive plant and pollinator species. The pollinators inhabiting those lands provide a natural resource base that directly benefits adjacent agriculture and rangelands, as well as broader biodiversity.

- A special initiative could be launched on these public lands to:
  - Restore native milkweed species to areas where they historically occurred,
  - Identify existing patches of milkweed and work to conserve and enhance them through active management, and
  - Restore native flowering plants to provide critical nectar and pollen for pollinating insects.

#### **At-Risk Pollinator Protection**

According to a new analysis conducted by the Xerces Society and the International Union for Conservation of Nature Bumblebee Specialist Group, approximately one-third of North America's 46 species of



bumble bees are at risk of extinction. Several species are critically imperiled and have been lost from extensive portions of their North American range. These declines are far more severe than those experienced by honey bees. Immediate action by Federal agencies is necessary to avoid losing a substantial, ecologically important, and high profile portion of our native pollinator fauna.

- The U.S. Fish and Wildlife Service could grant protection to the most endangered bumble bee species.
- The USDA Animal and Plant Health Inspection Service could protect wild bumble bees and native ecosystems by developing and implementing a disease certification system to reduce exotic pathogens in managed pollinators and prohibiting the introduction of any commercial species of bumble bee outside of its native range.

### **Protecting Pollinators from Pesticides**

A large—and growing—body of research demonstrates that neonicotinoid insecticides harm multiple bee species. There are multiple actions that could be taken to protect bees and other pollinators from these and other insecticides. To protect these animals from insecticides, we make the following recommendations:

- The U.S. Environmental Protection Agency (EPA) could re-assess the ecological safety of currently approved neonicotinoids and suspend registration of imidacloprid, clothianidin, thiamethoxam, and dinotefuran for all applications where there is a risk to nontarget organisms.
- The EPA could significantly speed up the registration review process for neonicotinoids. The risk from exposure to neonicotinoid insecticides needs to be scientifically evaluated against the risk posed to beneficial species by alternative control measures.
- The EPA could adopt risk assessment protocols for exposure to nontarget insects that account for cumulative and synergistic effects, effects of long-term exposure to low concentrations, and exposure to pesticides through pollen and nectar.
- The USDA Risk Management Agency's Federal Crop Insurance Corporation could approve reductions in crop insurance premiums for producers who avoid prophylactic use of neonicotinoids where the pest pressure does not warrant use. This would provide an incentive to encourage farmers to use Integrated Pest Management (IPM).
- The NRCS could be encouraged to use the agency's Pest Management conservation practice standard (595) to support farmer adoption of crop-specific IPM plans that reduce exposure of bees to bee-toxic pesticides. This can include techniques such as crop scouting and improved pest threshold levels that reduce use of bee-toxic pesticides, or adoption of crop-specific IPM plans developed by land grant university scientists to be lower risk to pollinators and other beneficial insects.

## **2. What potential public-private partnerships could be formed to address these issues?**

Public-private partnerships between the NRCS and NGOs such as the Xerces Society provide an exemplary model for advancing pollinator conservation. The success of these partnerships is based upon the science-based pollinator expertise provided by NGOs, and upon the private-sector funding raised by NGOs to match NRCS dollars (typically on a 1:1 basis). The net effect is private sector investment in Federal conservation programs and access to specialized expertise available through NGO scientists.

- Support for successful pollinator-related partnerships between Federal agencies and NGOs could be continued and expanded, including support for NRCS-NGO partnerships, and the multi-



agency Monarch Joint Venture (currently supported through Forest Service International Programs).

- Additional agency and NGO partnerships could be fostered to focus on pollinator conservation. For example, the FSA could be encouraged to develop NGO partnerships similar to the highly successful ones developed by the NRCS.
- Numerous food production and distribution corporations, including General Mills and Whole Foods Market, are already significantly invested in pollinator conservation. These companies are ideally positioned to join a public-private initiative to restore bees and butterflies to the landscape.

### **3. What significant commitments could your organization make to help the White House raise attention to these issues?**

The Xerces Society manages the largest pollinator conservation program in the world. We have a highly successful track record of supporting agencies like the NRCS, as well as farmers who are actively working to conserve pollinators on their land in all 50 states. We are immediately poised to:

- Support the White House in educating the public about the need for pollinator conservation.
- Provide the technical expertise to carry out large-scale habitat conservation projects for bees, monarch butterflies, and other pollinators.
- Fast-track plant production for monarch and bee habitat restoration with our partners in the native wildflower seed industry across the United States, based on our experience in bringing into production 11 species of native milkweed that were not previously available.
- Bring committed business leaders such as Whole Foods Market and General Mills to the table. These companies are already working to incentivize their farmer-supply chain to take action for pollinators, and would welcome White House efforts that complement their cause.

The Xerces Society manages citizen science projects to engage the public in tracking the status of bumble bees and monarch butterflies. We are prepared to:

- Train Federal biologists to engage in ongoing citizen science programs, such as Bumble Bee Watch, Project Milkweed (milkweed mapping), and the Western Monarch Thanksgiving Count to track pollinators on Federal lands.
- Use the data from these projects to prioritize areas on public land for habitat protection, enhancement or restoration that would be most beneficial to monarch butterflies or at-risk native bumble bees.
- Engage our networks of citizen scientists in a national pollinator conservation initiative, if appropriate.

We welcome ongoing dialog around these opportunities to support the White House, and we are committed to making pollinator conservation a legacy achievement for the President.

# Farming with Pollinators

## Increasing Profit and Reducing Risk

Pollinators are a critical part of profitable agriculture.

Native bees can provide all the pollination a crop needs.

Native bees are more efficient than honey bees at pollinating some crops.

Native bees can buffer against honey bee losses.



Bumble bees are important pollinators of raspberry and other cane crops (Photograph © Mace Vaughan)

Insect pollination is critical for the production of many important crops in the United States including alfalfa, almonds, apples, blackberries, blueberries, canola, cherries, cranberries, pears, plums, squash, sunflowers, tomatoes, and watermelons. Native pollinators, most importantly wild bees, provide free pollination services and enhance farm productivity and profitability through increased yields and improvements in crop quality. Native pollinators supplement services provided by managed pollinators and are an increasingly important resource in 21<sup>st</sup> century agriculture.





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## **Native Pollinators Can Increase Crop Yields**

There are approximately 4,000 species of native bees in North America, and—if adequate natural habitat is nearby—they can provide much of the pollination necessary for many crops, and in some cases all of it. For example:

- Over fifty species of native bees visit watermelon, sunflower, or tomato crops in California.
- Over eighty species of bees pollinate berry crops in Maine and Massachusetts.
- Native pollinators have been shown to nearly triple the production of cherry tomatoes in California.
- Wild native bees improve the pollination efficiency of honey bees in hybrid sunflower seed crops by causing the honey bees to move between male and female rows more often. The only fields that had 100 percent seed set were those with both abundant native bees and honey bees.
- If more than 30 percent of the area within 1.2 km of a field is natural habitat, native bees can deliver full pollination of watermelons in California's Central Valley.
- In the absence of rented honey bees, canola growers in Alberta, Canada, make more money from their fields if 30 percent of the land is left in natural habitat, rather than planting it all. This natural habitat supports populations of native bees close to fields and increases bee visits and seed set in adjacent crops.



## Native Bees Are Effective and Efficient Pollinators

Native bees are more effective than honey bees at pollinating flowers on a bee-per-bee basis.

- Only 250 female orchard mason bees (also called blue orchard bees) are required to effectively pollinate an acre of apples, a task that would need 1.5 to 2 honey bee hives—approximately 15,000 to 20,000 bees.
- Many native bees, such as mason and bumble bees, will forage in colder and wetter conditions than honey bees.
- The range of foraging behaviors is more diverse among many species of native bees than in European honey bees. For example, honey bees foraging for nectar seldom contact the anthers (pollen-producing structure) in many orchard crops, unlike orchard mason bees that forage for both pollen and nectar.
- Some native bees specialize in one type of flower. Squash bees, for example, visit primarily cucurbits; the females begin foraging before dawn, and males spend the night in the flowers, resulting in efficient pollination and larger fruits.
- Unlike honey bees, bumble bees and other native bees perform buzz pollination (the bee grabs onto a flower's stamens and vibrates its flight muscles, releasing a burst of pollen from deep pores in the anther). This behavior is highly beneficial for the cross-pollination of tomatoes, peppers, cranberries, and blueberries, among other plants. Although tomatoes don't require a pollinator to set fruit, buzz pollination by bees results in larger and more abundant fruit.

## Native Bees Can Buffer Against Pollinator Losses

If populations of one bee species decline because of natural cycles of parasites or disease, other native bee species can fill the gap and provide a stable, reliable source of pollination. Furthermore, if the beekeeping industry continues to have trouble because of pests and diseases, or the mysterious Colony Collapse Disorder, native bees can fill in when honey bees are in short supply or more expensive. Farms with strong populations of native pollinators may save money because they have less need for imported hives of honey bees

## Native Pollinators Can Help Diversify the Farm

- Farms that provide habitat for native bees may promote themselves as wildlife-friendly or sustainable. When faced with many choices about where and from whom to purchase produce, consumers may choose farms that are “pollinator friendly” over others.
- If a small farm is open to tours or u-pick—an increasing trend, especially at berry patches—beautiful hedgerows and other improvements for wildlife can be promoted as an additional reason to visit the farm. A farm could even host a tour showcasing its resident, beneficial insects.
- Some species of wood-nesting bees may be reared in nest tubes and sold at local farmers markets or produce stands for home gardeners looking for efficient, local, and gentle (non-stinging) pollinators.