



# Michigan Blueberry Pollination



## Blueberries Require Pollination



**Highbush blueberries need pollination in order to produce large, marketable fruit.**

Pollination increases fruit set, berry size, and allows for earlier ripening. Most common cultivars of northern highbush can be well pollinated by their own pollen and are planted in large blocks. Others benefit greatly from cross-pollination and should be interplanted. Check with your nursery for details. Most Michigan blueberry growers bring in managed hives of European honey bees for pollination. Several types of wild bees, particularly bumble bees and several species of miner bees, are also highly efficient pollinators of blueberries. **More than 80 bee species visit Michigan blueberry flowers to collect pollen and nectar to feed their young.**

## Integrated Crop Pollination: combining strategies to improve pollination

Combining different bee species and pollination management strategies can help growers ensure reliable pollination. Different species of bees visit flowers at different times of the day and may be active at different times through the bloom season. **Diversifying the set of pollinators in your fields can help ensure consistent pollination from the beginning to the end of crop bloom.**

Cool, rainy, and windy spring weather can lead to poor pollination. **When multiple pollinator species are active, more flowers are likely to be visited on poor weather days.** Large-bodied bees, such as bumble bees and carpenter bees, stay more active under cool and cloudy conditions than honey bees and can help pollinate the crop in variable spring weather.



Pollination is essential for blueberry production. **On the left**, a blueberry cluster that was enclosed in a mesh bag during bloom to exclude pollinators. **On the right**, a blueberry cluster that received pollination. Photo: Julianna Wilson.



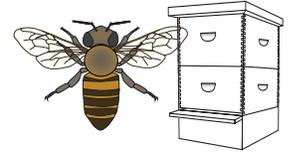
Rufus Isaacs

Both wild and managed bees benefit from access to flowering plants that provide them with abundant and diverse sources of pollen and nectar. **Maintaining natural habitat around your farm can help ensure that food and shelter are available to the bees that pollinate your crops.** This is particularly important for longer-lived wild bees, such as bumble bees and sweat bees, which are active from early spring crop bloom through the summer. If natural habitat is limited around your farm, consider planting or encouraging a mix of flowering shrubs, trees, and wildflowers to provide season-long blooms that will sustain your local wild bee populations.

# Meet the Pollinators

## Honey Bees

(*Apis mellifera*) are commonly managed or rented for blueberry pollination. Honey bees are easy to manage and transport, and provide many active pollinators per hive. A 6–8 frame colony will have around 15,000–20,000 pollinating bees. Hives are typically placed at a rate of 2–4 hives/acre when the crop reaches 5–10% bloom, and are removed from fields at petal fall.



## Wild Bees

There are many different types of wild bees that are active pollinators of Michigan blueberries. Research is ongoing on the relative contributions of these different groups to Michigan blueberry pollination.



### Bumble Bees

(*Bombus* spp.) are highly efficient blueberry pollinators. There are at least 7 species of wild bumble bees that pollinate Michigan blueberries, and one species that is commercially available. A single colony of bumble bees has around 25–400 bees. Because of their large body size, bumble bees can fly at lower temperatures than honey bees, making them ideal pollinators in typical early spring weather. Commercial colonies can be as effective as honey bees if enough are used, but blueberry fields with high honey bee stocking will have limited gain from the additional expense of bumble bees.



### Miner Bees

(*Andrena* spp.) are solitary bees that nest in the soil. Several species are excellent blueberry pollinators, including one species that exclusively visits blueberry flowers. These bees are generally only active in spring, when blueberry and other fruit crops are blooming.



### Carpenter Bees

(*Xylocopa* spp.) resemble large bumble bees, but with shiny rather than hairy abdomens. Carpenter bees excavate nesting tunnels in wood. Like bumble bees, their large size allows them to visit flowers on cool, cloudy days. Carpenter bees often cut a slit in the side of blueberry flowers in order to access the nectar, allowing honey bees to do the same in later visits. Nectar robbing bees still transfer some pollen between flowers, meaning that this practice can contribute to rather than take away from total pollination; however, when nectar robbing by honey bees begins to approach half of all honey bee visits, blueberry seed and fruit set are reduced.



### Other Wild Bees

There are many other kinds of wild bees, including sweat bees, mason bees, and plasterer bees, that pollinate blueberry flowers. Some of these bees live in the soil, while others live in aboveground cavities and tunnels excavated from plant stems (including old blueberry canes) and wood. For more information on the biology and conservation of wild bees of Michigan, visit <http://bit.do/wildbeesMI>.

## Three Practices to Support Bees

**1 Protect natural habitat around your farm and add additional flowering plants**  
Natural areas provide flowering resources and nesting sites that support wild bees. Flowering plants provide pollen and nectar for bees and their offspring. More diverse nutrition helps bees stay active and healthy.

**2 Minimize pesticide risks to pollinators**  
Use integrated pest management (IPM) to make targeted pest management decisions. Avoid spraying during crop bloom. If sprays are needed, spray after dusk or before dawn when bees are not active in the field, use products registered for use in bloom, and avoid tank mixes. Whenever possible, select pesticides that are less toxic to bees.

**3 Communicate with your beekeeper**  
Set up a contract to define the expectations of both parties and notify your beekeeper if you'll be spraying near hives.

### Additional Resources

**Integrated Crop Pollination**  
<http://projecticp.org>

**MSU Extension: Blueberries**  
<https://blueberries.msu.edu/>

**Blueberry Pollination Management**  
<http://bit.do/blueberrypollination>

**MSU Native Plants**  
<http://nativeplants.msu.edu/>

**Conserving Native Bees on Farmland**  
<http://bit.do/wildbeesMI>

**Bees of the Great Lakes Region and Wildflowers to Support Them**  
<http://bit.do/greatlakesbees>

**Attracting Beneficial Insects with Flowering Plants**  
<http://bit.do/E2973>

**Minimizing Pesticide Risk to Bees in Fruit Crops**  
<http://bit.do/E3245>