



Pollinators

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What is Pollination

- Pollination is the transfer of pollen from male anther to female stigma resulting in fertilization.
- Pollination results ultimately in a fertilized ovary resulting in fruit and seed production.
- Pollination provides nectar and/or pollen rewards from the flowers that pollinators visit.
- Some plants are wind pollinated

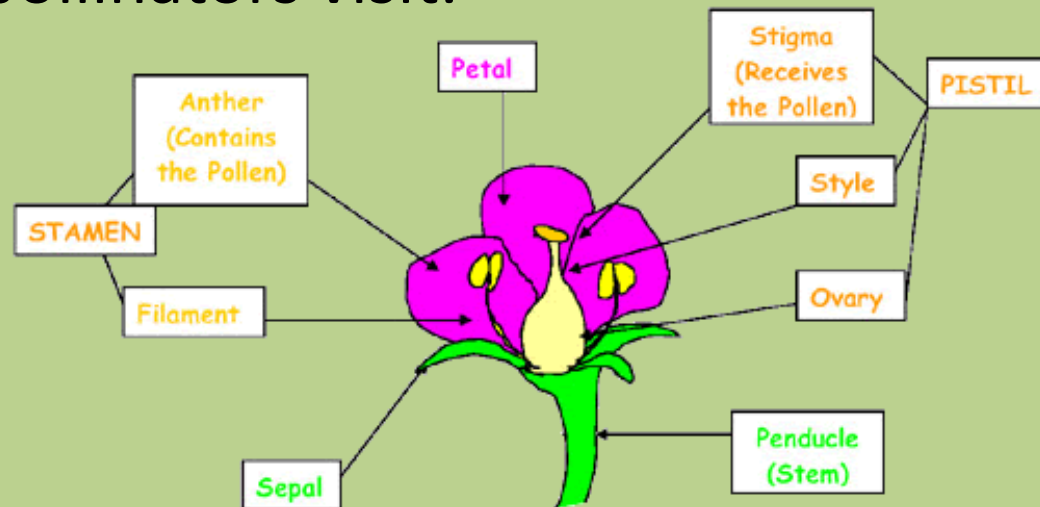


Illustration from USDA Forest Service

Why is Pollination Essential?

- Pollination is required for the production of many food crops
 - Animals pollinate approximately 75 percent of the crop plants grown worldwide
 - We eat the fertilized ovary in the form of fruits and seeds
- Pollination insures the reproduction and survival of most flowering plants
- Flowering plants in turn insure the survival of the pollinators, other animals, and us

Why is Pollination Essential?

Pollinators-

- help keep plant communities healthy and able to reproduce naturally
- assist plants in providing food and cover for wildlife, preventing erosion, and keeping waterways clean
- receive nectar and/or pollen from flowers they visit

Why is Pollination Essential?

- Pollinated plants produce fruit and seeds that provide a major part of the diet of approximately 25 percent of bird species, as well as many mammals.
- Pollinators support biodiversity, and there is a positive correlation between plant diversity and pollinator diversity

Who are the Pollinators?



- Insects and other organisms that transfer pollen from the male parts of a flower to the female parts of the same or another flower for fertilization.
- Provide an “ecosystem service” needed for the survival of most of the flowering plants in our environment.
- They are essential to the production of >75 crops.

Who are the Pollinators in FL?

- Honey bees
- Bumblebees
- Sweat bees
- Ground bees
- Flower (hover) flies
- Bee flies
- Butterflies
- Moths
- Various beetles
- Hummingbirds
- Bats
- Animals



Tom Butler, Penn State
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What do the Pollinators Need?

Shelter

- Many are solitary – old branches, bare soil, and/or dense shrubbery



Food

- Pollinators require nectar as primary food source

Water

- Bees and butterflies especially need water

Pollen

- Bees feed pollen to offspring





Jamie Ellis, UF/IFAS

Honey Bees (*Apis mellifera*)

- Honey bees are relied on for most commercial pollination
- Bees are fuzzy so pollen grains stick to their bodies.
- They have specialized pollen-carrying structures on the hind legs or lower abdomen.
- They gather nectar and pollen for their brood.



Eileen Buss, UF/IFAS



Eileen Buss,
UF/IFAS



Florida Bees



- There are over 300 species of bees in Florida
 - Almost all are native
 - Some are endangered
- Providing a landscape with a variety of flowering native plants is best way to conserve these bees



UF/IFAS photos

Native Bees

Join the Conversation
about
**Native
Bees**

What's the buzz?

North America has over 4,400 described species of native bees* that pollinate wildflowers and crops. From the tiny *Pegilota minima* to the substantial carpenter bee *Cyloceria venipes*, these local pollinators are hard at work in the floral landscapes of gardens, farms, forests, grasslands and urban and wild lands. Unfortunately, several species of native bees are showing disturbing signs of decline. Learn more about these colorful pollinators and how you can support them at www.pollinator.org



Non-bee Insect Pollinators

Proceedings of the National Academy of Sciences, January 2016

Non-bee insect pollinators

- play a major role in global crop production
- they're not as affected by environmental changes
- provided 25–50% of the total number of flower visits
- resulted in pollination services similar to those provided by bees
- increased fruit set with non-bee insect visits independently of bee visitation rates
- are not as reliant as bees on the presence of remnant natural or semi natural habitat in the surrounding landscape.

Other Pollinators



Threats to Pollinators

- Practices that create imbalances in natural ecosystems.
 - Habitat loss and fragmentation
 - Need a variety of native and introduced flowers
 - Fragmentation increases the distance pollinators must travel between areas providing food and shelter
 - Habitat loss to residential and commercial development
 - Alien invasive species
 - Monocultures – extensive lawns, commercial agriculture



Threats to Pollinators

– Pesticides

- Intensive agricultural practices
- Broad spectrum pesticides are major threat
- Direct unintentional poisonings
- Indirect habitat loss from herbicide use



What Can We Do?

- **Plant a wide variety of plants that bloom at different times of the year**
 - Plant in clumps or drifts
 - Use native plants – they evolved with native pollinators
 - Night blooming flowers support moths and bats
 - Avoid using hybrid flowers – especially doubles
 - Embrace a bit of wild!





What Can We Do?



- Purchase plants from native nurseries and ask if they are sprayed with pesticides
- Notice blooming plants in the nursery – if you see a lot of pollinators, it is a good plant
- Consider fruiting native trees – early spring blooms are pollinator magnets



Callicarpa americana



Ilex vomitoria
Photo by Shirley Denton



Prunus umbellata

What Can We Do?

- Use a few plants with red tubular flowers for hummingbirds
- Provide water
 - Shallow birdbath with a couple semi-submerged rocks
 - Keep water fresh
 - Do not add chlorine – rain water or distilled water is best



What Can We Do?



- **Eliminate or curtail using pesticides**
 - Choose least toxic
 - Insecticidal soap, horticultural oils
 - Do not leave a residual like chemical pesticides
 - Spray in late evening when pollinators are not active
- **Many native bees nest in wood or under ground**
 - Leave a dead tree snag or a dead branch
 - Leave some bare soil in a well drained area
 - Build a bee house



NOT to Do List

- Do Not waste money on a butterfly house
- Do Not be meticulous
- Do Not pick up all the fallen fruit - leave a bit
- Do Not pull every weed you see – learn what to leave alone
- Do Not rake all the leaf litter
- Do Not use pesticides if at all possible



Questions??



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- Eileen Buss, University of Florida
- Phil Nixon, University of Illinois
- Tom Butzler, Penn State Extension
- Environmental Protection Agency
- iStockphoto.com
- Penn State Pesticide Education Program
- Beyondpesticides.org
- UC Davis “Bee Haven”

Resources:

- **Bee Labeling Info Graphic** (PDF). U.S. EPA.
<http://www.epa.gov/opp00001/ecosystem/pollinator/bee-label-info-graphic.pdf>
- **Pollinator Protection web page**, U.S. EPA.
<http://www.epa.gov/pesticides/ecosystem/pollinator/>
- **Pollinators and Pesticide Stewardship**. Coalition for Urban/Rural Environmental Stewardship, Syngenta, and Bayer Crop Science.
<http://pesticidestewardship.org/pages/resources.aspx>