



## Management of Pollinators in Vegetable Production

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More than 75% of leading global crop types benefit from animal pollination in production, yield and quality. A pollinator is anything that helps carry pollen from the male part of the flower (stamen) to the female part of the same or another flower (stigma). The movement of pollen must occur for the plant to become fertilized and produce fruits, seeds, and young plants. Some plants are self-pollinating, while others may be fertilized by pollen carried by wind or water. Still, other flowers are pollinated by insects and animals - such as bees, wasps, moths, butterflies, birds, flies and small mammals, including bats. *Honey bees are the most common pollinators.* Insects and other animals such as bats, beetles, and flies visit flowers in search of food, shelter, nest-building materials, and sometimes even mates. Some pollinators, including many bee species, intentionally collect pollen. Others, such as many butterflies, birds and bats move pollen accidentally. Pollen sticks on their bodies while they are drinking or feeding on nectar in the flower blooms and is transported unknowingly from flower to flower resulting in pollination.

**Keywords:** Introduction, Importance, Nature and Management

### Introduction

1. **Do you like to eat?** One out of every three bites of food you eat exists because of the efforts of pollinators, including many fruits, vegetables, and seeds. Pollinators not only are necessary for our own food, but support the food and habitat of animals.
2. **Do you like clean air?** Healthy ecosystems depend on pollinators. At least 75 percent of all the flowering plants on earth are pollinated by insects and animals! This amounts to more than 1,200 food crops and 180,000 different types of plants—plants which help stabilize our soils, clean our air, supply oxygen, and support wildlife.
3. **Do you want a healthy economy?** In the United States alone, pollination by honey bees contributed to over \$19 billion of crop production in 2010, while pollination by other insect pollinators contributed to nearly \$10 billion of crop production.
4. Some global statistics illustrate the scale of pollinator contribution to agriculture and food security: Of the 115 leading global crops consumed by humans, 87 rely on animal pollination, to some degree.
5. 35 percent of the crops we eat, in terms of the volume produced globally, depend on animal pollination, to some extent.
6. It is estimated that five to eight percent of global crop production, with an annual market value of 235 billion - 577 billion US dollars, is directly attributable to animal pollination

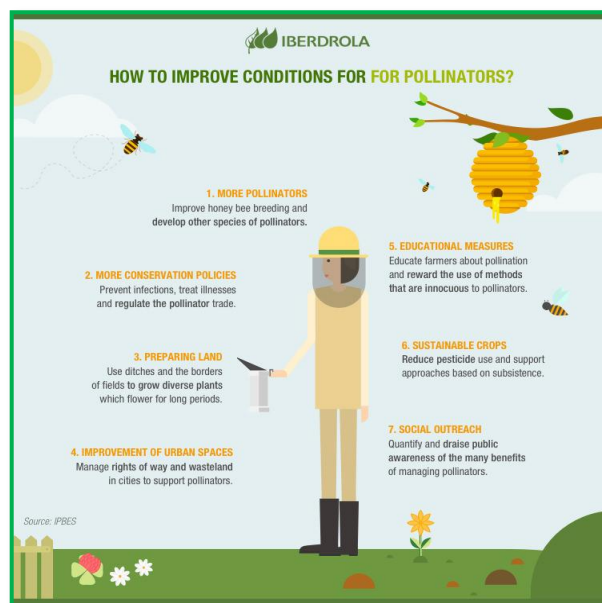
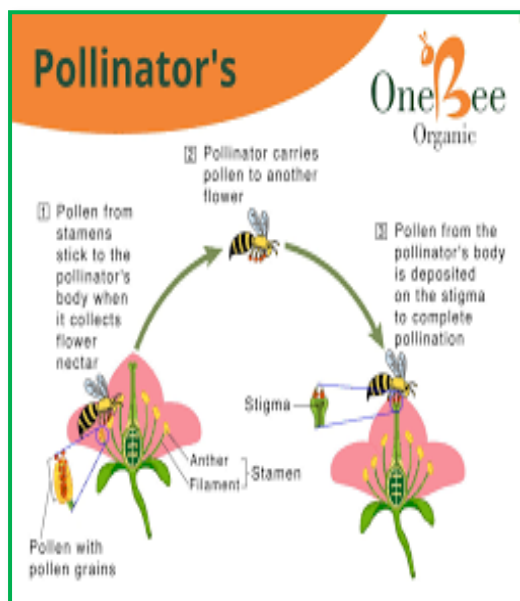
### Types of pollinator

**Biotic pollinator:** insect, bat, snail

**Abiotic pollinator:** wind, water

### Different pollinators which play vital role in pollination

Pollinators	Contribution (%)
Bee	73%
Flies	19%
Bats	6.5%
Wasps	5%
Beetles	5%
Birds	4%
Butterflies	4%



### List of crops which requires and doesn't require the pollinators

Crops That Require Pollinators	Crops That Don't Require Pollinators But Have Better Yields With Them	Crops From Which Pollinators Collect Pollen
Melons, Cucumber, squash/pumpkin	Eggplant, lima bean, Okra, Pepper	Pea ,snap bean ,tomato

### In vegetable production, insecticides can harm pollinators (including bees) in several ways:

1. When pollinators are present, resulting in direct exposure. This can be true for crops that require pollination services and for crops where pollinators are only feeding on pollen.
2. Applicators apply insecticides to fruit or vegetables when pollinators are not present, but the insecticide residues persist long enough to potentially harm pollinators when they visit the crop.
3. Applicators apply systemic insecticides to fruits and vegetables. These products move through the plant to flowers in quantities that could harm pollinators.
4. Applicators apply insecticides outside the fruit or vegetable production field that move (in some manner) into the field in sufficient quantities to harm pollinators.
5. The residues of systemic insecticides remain in the soil from a previous crop. The fruit or vegetable crop then takes up the insecticide, which moves to flowers in quantities large enough to harm pollinators.

## Factors responsible for decline of pollinators

- Land use Change
- Increase in insecticide and pesticides
- Climate change
- Protection of Pollinators

## Best Management Practices to Attract and Protect Pollinators

- Plant native and other well-adapted flowering plants for season long bloom in or near the garden.
- Create nesting habitat for ground- and cavity-nesting bees.
- Do not spray insecticides or fungicides on flowering plants or fruit trees just before or during bloom.
- If pesticide applications are necessary, choose a product with the least toxicity to bees.

## Strategy to increase pollinators

- An adequate population of bees should be maintained to insure pollination.
- Conservation and management of the pollinators through commercial bee keeping.
- Proper selection of insecticides for treating other pests is important to minimize adverse effects on the pollinators.
- Enhancement of skill through training and extension.
- Creation of Awareness of commercial bee keeping.

## Conclusion

Pollinators are the agents of pollination. Decline in the population of pollinator poses a threat to global agriculture. Much of the food we eat would not exist without pollinators. Therefore, it is utmost essential to take a positive step towards pollinator conservation. Pollinators are the important factors for vegetable production and without pollinators crosspollination is not possible in many vegetable crop. pollinators boost 5x yield of crop. Bees are mid-morning risers. Meaning they will be out and about during the day. Early morning could be best if you don't have time to wait for dry grass. But either way **before 9a.m. or after 5p.m.** is the best time to mow your lawn to avoid bee stings.

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