SUPPORTING POLLINATORS IN THE HOME GARDEN

Master Gardener Volunteer Training

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WHY DO WE CARE ABOUT POLLINATORS?

- Approximately one in three mouthfuls of food and drink require the presence of a pollinator
- Some crops are almost entirely dependent upon pollinators. Others have evolved so that only certain species can pollinate them
- Although we think about the importance of pollinators to humans, vast parts of the ecosystem from song birds to apex predators depend upon pollinators

How dependent are foods on pollinator insects?

Our World in Data

No dependency Yields are not affected by pollinators	**Cereals:** wheat, maize, rice, sorghum, barley, rye, millet, oats **Roots and tubers:** cassava, potatoes, sweet potatoes, carrots **Legumes** including lentils, peas, chickpeas **Fruit and veg** including bananas, pineapples, grapes, lettuce, pepper **Sugar crops:** sugar cane and sugar beet Also includes: areca nuts, asparagus, cabbages, castor oil seed, cauliflower, chicory roots, dates, garlic, hazelnuts, jojoba seeds, leeks, olives, onions, pistachios, quinoa, spinach, taro, triticale, walnuts, yams.
Little dependency Yield reduction of 0% to 10% without pollinators	**Fruit and veg** including oranges, tomatoes, lemons, limes, papayas **Oilcrops** including palm, poppy seed, linseed, safflower seed **Legumes** including beans, cow peas, pigeon peas **Groundnuts** Also includes: bambara beans, chillies, grapefruit, persimmons, string beans
Modest dependency Yield reduction of 10% to 40% without pollinators	**Oilcrops** including sunflower seed, rapeseed, sesame, mustard seed **Soybeans** **Fruits** including strawberries, currants, figs, gooseberries, eggplant **Coconuts and okra** **Coffee beans** Also includes: broad beans, karite nuts, seed cotton
High dependency Yield reduction of 40% to 90% without pollinators	**Fruits** including apples, apricots, blueberries, cherries, mangoes, peaches, plums, pears, raspberries **Nuts** including almonds, cashew nuts, kola nuts **Avocados** Also includes: cucumber, buckwheat, nutmeg, anise, fennel, coriander
Essential Yield reduction greater than 90% without pollinators	**Fruits** including kiwi, melons, pumpkins, watermelons **Cocoa beans** **Brazil nuts** Also includes: vanilla, quinces

Sources: Marcelo Aizen et al. (2019) and Alexandra-Maria Klein et al. (2006). Icons sourced from Noun Project

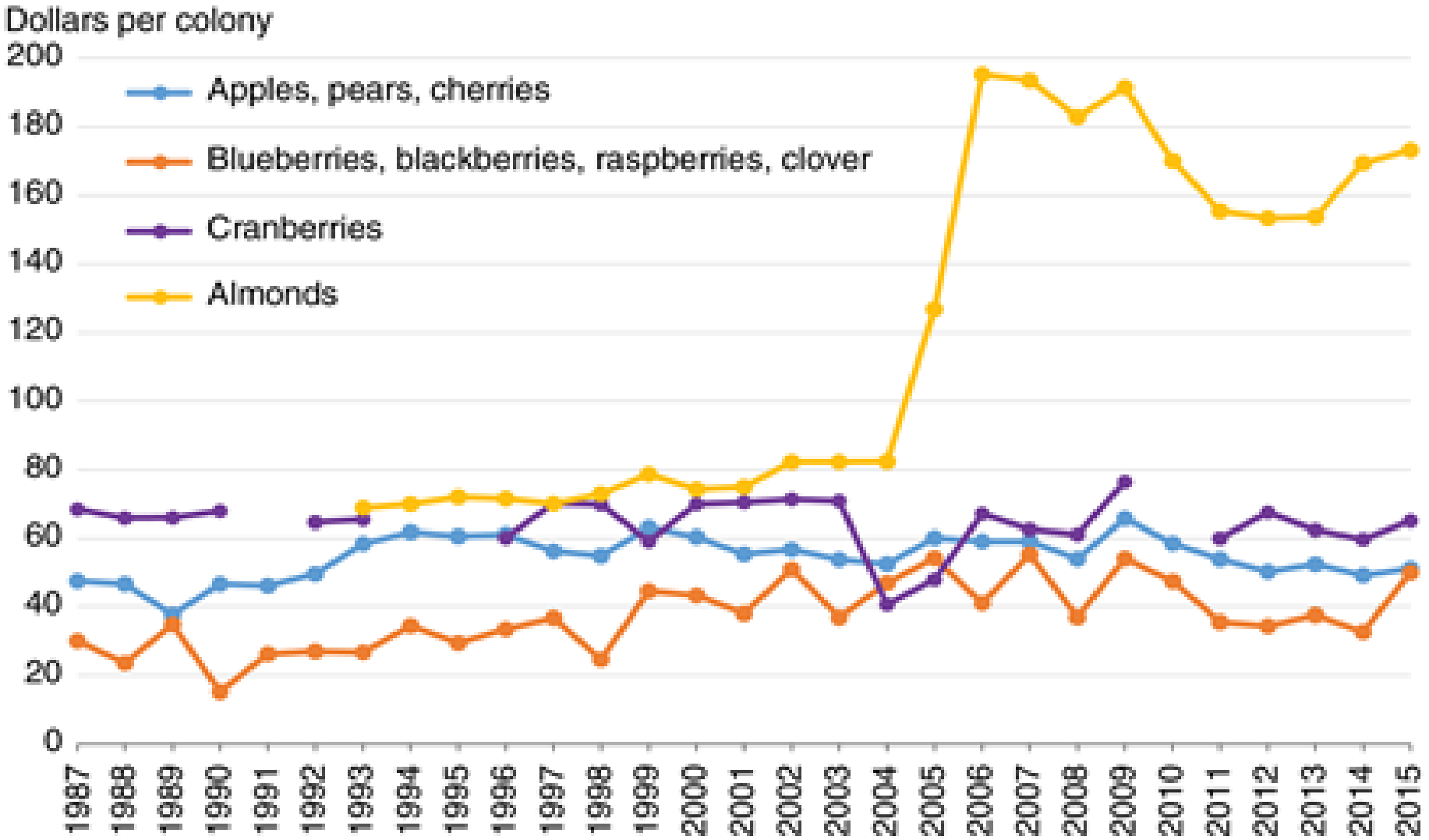
POLLINATORS ARE VITAL TO THE ECONOMY

- Blueberries
  - Hundreds of thousands of Honey Bee colonies are trucked into blueberry farms each May and June
  - The honey bees have evolved specific methods of gathering nectar and pollen that increases their pollination efficiency over other insects
  - Blueberries would disappear from most retail sales venues without the services of migratory beekeepers

POLLINATORS ARE VITAL TO THE ECONOMY

- Almonds
  - California almonds require the services of millions of migratory bee colonies each February
  - Beekeepers from across the U.S. bring their bees to California for these services. This is a major source of income for most beekeepers
  - Pollinating almond orchards is uniquely stressing to honey bees and is thought to contribute to the spread of bee diseases

Almond pollination service fees more than doubled since 2004



Source: USDA, Economic Research Service using data from Burgett et al. (2010a). All prices adjusted to 2015 (real) values using the Producer Price Index.

OTHER CROPS AND POLLINATORS

- Pumpkins and Squashes require either honey bees or native pollinators to set fruit
- Commercial farms often hire beekeepers to bring honey bees for pollination services, but what of home gardeners?
  - Encourage pollinators by following a plan
  - Hand pollinate blossoms

WHO ARE THE POLLINATORS?

BEES

- Honey Bees
- Carpenter bees
- Bumble Bees
- Solitary Bees
- Wood Bees
- Over 400 native bee species in New York alone!

FLIES

- Flies are second only to bees as important pollinators. Some plant species, such as commercial carrots are dependent upon flies for efficient pollination
- Pollinating flies often look like other insects such as this tabanid fly on red thistle

VERTEBRATES

- Birds, such as this Ruby Throated Hummingbird and other nectar drinking species are incidental pollinators
- In the tropics mammals like Bats are vital to the pollination of fruits and flowers

BUTTERFLIES & MOTHS

- Butterflies are also pollinators
  - Monarch butterflies are dependent on milkweed, but also pollinate calendula, yarrow and other wildflowers
- Moths and Butterflies are considered secondary pollinators, they pollinate flowers incidental to their gathering nectar, but are not as efficient as bees.

THREATS TO POLLINATORS

HABITAT LOSS

- Habitat loss reduces both the foraging opportunities and nesting options for pollinators
- Loss is being seen at both the macro, urbanization level and micro, highly manicured suburban lawns level
- A particular threat is a homogenized landscape that limits the type and quality of forage plants.

CLIMATE CHANGE

- Changing environmental conditions disrupts pollinators long established life cycle patterns
- Plants that used to be available throughout the growing season now suffer from heat in the summer causing a dearth of floral options
- Climate destabilization particularly effects some highly specialized pollinators in very sensitive ecological areas who are not readily replaced by others (think ADK mountain tops)

PESTICIDES & OTHER CHEMICALS

- Application of pesticides to address one problem often have consequences beyond their range of application
- Due to their role in the environment pollinators are particularly susceptible to the miss-use of pesticides
- New forms of systemic pesticides carried in plant tissue have particularly insidious effects on pollinators

FOUR STRATEGIES FOR POLLINATOR SURVIVAL

1. RECOGNIZING EXISTING HABITAT

- Upstate NY landscapes tend to be particularly good for pollinators
  - Varied terrain
  - Mix of landscaping patterns from forest to open meadow
  - Buffered from climatic changes
- Domestic landscaping is often a mix of "country" and "town which provides a healthy mix of pollinator options

PROTECTING HABITAT

- Be aware of your local environmental conditions. Is there spraying of trees happening? Are there building projects that might disrupt pollinators?
- Are you using chemical interventions for landscaping problems? Reduce or eliminate that use and always follow the product's labels guiding use
- Advocate for environmentally sensitive practices with family, friends and community

PROVIDING NEW HABITAT

- Expand your landscaping with new, smaller gardens populated with native floral plantings
- Design gardens with both forage and habitat opportunities so that pollinators minimize flight time.
- Sometimes it can be as simple as buying a solitary bee structures and putting them in your garden!

MANAGING HABITAT

- Plan your gardens to have varied blossoms through the season starting in May and ending in October
- Think vertically as well as horizontally when planning gardens to support different pollinator species
- Refer to Xerces Society and other resources to source native plants as much as possible

POLLINATOR RESOURCES

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- https://www.publicgardens.org/resources/creating-pollinator-garden-native-specialist-bees-new-york-and-northeast
- https://efotg.sc.egov.usda.gov/references/public/SC/Bee_Basics_North_American_Bee_ID.pdf
- https://xerces.org/
- https://cals.cornell.edu/pollinator-network