



What Can Home Gardeners do to Help Honey Bees?

by Eric Mussen, Bee Specialist, UC Davis

Most people have heard about the decline in honey bees during the last several years. Are there things home gardeners can do to help?

Better Nutrition: The actual cause of the decline is still uncertain. What is known is a number of factors are probably involved. Honey bees are their most robust and able to best contend with stresses when well fed. In addition to water, honey bees require nectar sources for carbohydrates and a varied mix of pollens to provide proteins, lipids, vitamins, minerals, sterols, antioxidants, and other nutrients. Drought, flooding, and conversion of former foraging grounds into large urban areas including housing developments, cities, highways, airports, agricultural monocultures and so forth have led to honey bee malnutrition in many locations.

In the last 20 years beekeepers have been encountering a series of previously exotic pests that invade the hive and kill bees, such as the varroa mite, new honeybee diseases, *including the fungus Nosema ceranae*, and many viruses.

Attractive Plants: There are several ways gardeners can help protect bees. Choose plants that honey bees prefer and try to keep a variety of plants blooming throughout the year. Bees need floral resources (pollen and nectar) all year long. Adult bees feed on sugary nectar for energy. The pollen they collect is a protein and vitamin rich source which they will feed to their young. Nectar and pollen are combined to form a “bee loaf” that females provide for their larvae to feed on.



Honey bee friendly flowers

Plants in the Aster (Composite) family provide both pollen and nectar and there are numerous native and non-native flowers to choose from. Imagine a sunflower (*Helianthus annuus*), this is a typical Aster flower that is made up of both disk flowers (the tiny flowers in the center) as well as ray flowers (the larger petals on the edge of the flower). The center of the flower is where the bee gets nectar and pollen. If you see a bee inserting its’ proboscis (tongue) into the disc flowers, it is most likely collecting nectar. If the bee isn’t taking a drink, it may be “dancing” around on the flower collecting pollen, which it will pack onto its’ hairy legs or abdomen. Flowers in the

Aster family are good for bees because they don't have to work too hard to get what they want. The flower presents its resources on a pedestal and even gives the bee a nice landing area.

For more information and pictures about bee biology and lists of plants that bees like to visit, see the following two fantastic websites about bees. One is from UC Davis

<http://beebiology.ucdavis.edu> and the other is from the UC Berkeley Urban Bee Lab <http://www.helpabee.org/index.html>.

Fewer Pesticides: Pesticides can also be involved in bee decline, especially when applied to plants when they are in bloom and bees are foraging. Thankfully most home gardeners are not making sweeping sprays of insecticides in their back yards anymore. Many insecticides are highly toxic to bees including organophosphates, carbamates, and pyrethroids. The most common organophosphates Diazinon and Dursban (chlorpyrifos) are no longer available to home gardeners, but malathion is. Sevin (carbaryl) is a common carbamate, but the majority of insecticides that homeowners use for ants, cockroaches, beetles and bugs are pyrethroids.



Honey bee on tidy tips, California native wildflower in the aster family, on UC Davis campus. (Photo by Kathy Keatley Garvey)

A newer class of insecticides, the neonicotinoids, which include imidacloprid, clothianidin, and dinotefuran, also pose hazards for honey bees. These products are systemic materials that move through the plant and are included in the nectar and pollen of flowers when they bloom. Although the neonicotinoid residues may not kill bees immediately, they may have sublethal effects, such as suppressing immune and detoxification systems, causing bees to be more sensitive to other stresses.

If not killed directly by a spray in the field, foraging bees can collect residue-contaminated pollens and bring them back to the hive for immediate consumption or long term storage. There are serious concerns over the chronic sublethal effects of these residues on the physiology of immature and adult bees.

Even when plants aren't in bloom, use nonchemical management methods or pesticides with little or low toxicity to bees such as soaps, oils, or *Bacillus thuringiensis* (Bt) whenever possible.

June 27, 2013