

Farming

WITH
HONEYBEES



Honeybees play an important role in the pollination of many vegetable crops in Hawaii

Increasing agricultural yields through honeybee pollination

Honeybees live in large colonies and feed exclusively on nectar and pollen. Each colony has many adult bees that search the fields for suitable flowers. In the process of gathering food the bees help spread pollen from one flower to another and in this way they pollinate the crops they visit.

Honeybees help increase yields for many tropical crops. Fruit trees such as lychee, avocados, oranges, and macadamia nuts are examples of bee pollinated plants. Many vegetables, in particular cucurbits

such as cucumbers, squash, watermelon, also require bee visits for adequate fruit formation.

Until a couple years ago Hawaii growers had been fortunate to have many feral colonies that worked their fields for free.

However, in 2007, a new pest of the honeybee, the Varroa mite, arrived to the islands and the bees are now scarcer.

Bee benefit example.

A honeybee hive working a hectare of cucumbers can yield 3 times more fruits than plots without bees. Each individual fruit is also heavier in bee pollinated plots compared to those plots without bees.

The number of bee visits a flower receives influences the quality of the fruit that develops..Cucumber flowers must receive 8 to 10 bee visits to produce an acceptable fruit.

UH BEE PROJECT 2009

CTAHR, UNIVERSITY OF HAWAII

If you are interested in having bees in your farm or would like more information about Varroa mites, please visit our website at Bee Project CTAHR
http://www.ctahr.hawaii.edu/wrightm/Honey_Bee_Home.html



Varroa mites found feeding in a brood cell

Varroa mite biology

The Varroa mite (*Varroa destructor*), a relatively large parasitic mite, ranks among the most destructive bee parasites worldwide.

Varroa mites feed on the haemolymph (blood) of developing larvae and adult bees. Parasitized larvae are weakened or may die of the impacts of being parasitized. Bees may also become infested with deformed wing virus, which is spread by the mites.

The impact of the Varroa mite may be more severe in tropical regions than temperate zones, owing to the fact that honeybees produce brood year-round in the tropics, which permits the mites to continue reproducing year round and consequently the mite populations can increase rapidly in warm climates.

Untreated colonies are weakened by the mite, and may die within a year or two of infestation.

The impact of the varroa mite on beekeepers and farmers

Feral colonies are significant sources of pollinators, and their decline has negatively impacted agriculture. The sudden disappearance of feral bees has created a need for managed hives at a time when the beekeepers themselves are struggling to minimize their losses.

On Oahu, the lack of feral hives has been felt by many small scale farmers and gardeners. Many growers have even resorted to hand pollinating their crops.

Farmers need to consider if they require bees to maintain a high level of productivity on their farms, and whether they decide to form a partnership with an established beekeeper, or learn how to keep bees for themselves, it is important to select Varroa treatments and insecticides that promote pollinator safe environments and are sustainable in the long run.

Pesticides and bees

Insecticides are deadly to bees and it is important for growers to find ways to minimize their destructive impact on pollinators.

Here are some tips to reduce honeybee poisoning in your farms:

1. Avoid spraying crops when they are in bloom
2. Avoid spraying when the bees are most active
 - Apply insecticides at "off hours" when the bees are not working your crops to minimize exposure
3. Reduce pesticide drift
 - Avoid dust pesticides which tend to drift away from intended locations
 - Do not contaminate water resources with pesticides or fertilizers
4. Chemical formulation
 - Use less toxic compounds

Reducing pesticide use is the best way to ensure pollinator safety, however if pesticides must be used, select the least toxic formulations and consider the safest time to apply the pesticide. For more information please visit:

The Xerces Society
<http://www.xerces.org/pollinator-conservation/>
 Pacific Northwest Extension
 Publication
<http://extension.oregonstate.edu/catalog/pdf/pnw/pnw591.pdf>