

Stay-at-home Bees: Some Thoughts On Conserving Pollinators

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Many types of insects and animals can be pollinators; however, species of the genus *Apis* are the main pollinators of North American crops. Despite their small size, bees are important to pollinating American crops and natural plants alike, increasing crop yields. This discussion will refer to only one species of pollinator, *Apis mellifera*, the common honey bee found in the American market.

Throughout history the honey bee has provided pollination for crops naturally. The earliest record of bees appear as fossil deposits from about thirty five million years ago at the time of the Oligocene period.(1) Man has interacted with the bee for wax and honey since the pyramids were built in ancient Egypt at the time of the Old Kingdom about 2500 B.C.(2) Rock art suggests mankind has interacted with the bees earlier still.(3) For centuries the bee and the human had maintained a balanced relationship. With the development of the movable Langstroth hives in the mid-19th century (4) beekeeping changed from a small endeavor to a large scale operation where hives could be moved long distances for increased crop and honey yields. And so we see the birth of modern beekeeping. This system has worked very well until recently.

In the world of contemporary beekeeping, the honey bee plays an important role in crop productivity and the income of beekeepers. Large monoculture orchards, for example, almonds are often pollinated by imported colonies of honey bees. Sometimes these bees are moved many times during a season to perform this task. Only recently has there been a significant loss of natural pollinators in North America. In the last twenty

years the number of colonies in the United States has gone from about seven million to little more than two million.(5) Some of this loss could be due to increasing U.S honey imports from other countries, mainly China and Argentina.(6) But that isn't the total reason. This loss is threatening the present beekeeping industry as well as threatening the existence of many crops we have come to depend on. Among the reasons for this decline could be the cultivation of large monocultures, the use of herbicides and pesticides, loss of plant diversity and the increase of diseases and parasites.(7) Worthy of exploration are two other factors and these have to do with contemporary beekeeping practices. The attempt to destroy disease and threats instead of strengthening against it. And mass colony transportation, for widespread crop pollination. Something could be wrong with the standard practices.

Instead of attempting to destroy the mites through medication I propose we focus on strengthening our hives. I believe a strengthened hive will be more resistant to disease. I would like to explore the possibility that the movement and transport of colonies is partly responsible for the recent decline in the general strength of the bee, making it no longer resistant to opportunistic diseases and parasites like the varroa and tracheal mite. I believe we should consider the practice of supplementing the hive with sugar.

In nature, honey bees are a home-based society. For years a hive is one location. The colony lives on year after year like a well functioning village. Every day the worker bee returns home thousands of times. They swarm when their "village" finds it necessary and they re-queen when necessary. They are involved in keeping their colony strong. This "village" idea does not exist in contemporary practice. Bees from other colonies can

be introduced, swarms are discouraged and queens come from elsewhere. The colony is moved sometimes hundreds of miles. Does turning a very home-based agricultural species into a nomadic based one contribute to spreading disease? Can the stress factor of movement from original location as well as mixing the populations of colonies cause the weakening of the hive? Perhaps we should observe the nature of the bee's behavior and design methods that will work with it to strengthen the hive.

During the pollination season bees are brought to the fields and build honey stores for the winter. After the season is over, the bees are trucked home. They glean local nectar and are fed a sugar and water mixture to make up for the honey that is removed for harvest. Here we might have a problem worthy of exploration. Honey, which is the bee's natural diet, has a very different molecular structure than sugar, a much cheaper alternative.(8) Could feeding bees a supplement that is molecularly different have, over generations, a negative effect in weakening the bees' immunity against the havoc created by the mites, nosema, American foulbrood, etc? Is feeding the bees sugar the equivalent of feeding them "junk food?" Corn syrup is also much different than honey, though they may seem similar in their consistency. Corn syrup does not have any minerals in it, whereas honey is very high in minerals. Could our bees be becoming weakened from lack of minerals making them prone to diseases and pests. (9) It may not be economical to supplement with honey. Southern Oregon beekeepers Scott Keene and Don Ruddick, "Suspect the bees may have died from syrup they were fed, a manufactured high-fructose corn syrup that when overheated can produce a chemical toxic to the bees." Both of whom have suffered major losses from what is now being called colony collapse disorder, a nationwide problem with no solution eminent.(10) However, could a

supplement that is molecularly similar to honey be developed? Or, do we have to forgo some honey for the sake of our hives?

The problem of declining bee populations is very real. Honey bees don't just provide honey, they are vital to the production of many foods. The honey bee is much more than a small insect. The bee is vital in sustaining our food sources. It would be a great folly to lose this species. The large monoculture model, though, may no longer be sustainable. It is time to find solutions. The solutions might mean thinking local. A system that develops local pollination and builds strong local farmer and beekeeper relations perhaps could help prevent the loss of *Apis mellifera*. There could be a system where a local beekeeper contracts his or her pollinators to local farms, eliminating long distance transportation of hives. Would returning to more traditional beekeeping methods, while maintaining some modern methods, help preserve the honey bee?

Apis mellifera, the common honeybee, are not the only pollinators North America, in fact many many other insects pollinate our crops and natural vegetation alike. However, if the honeybee is driven to extinction through our own lack of understanding their specific needs, the natural pollinators, bumble bees, mason bees, butterflies, moths, etc. may not be sufficient to provide the amount of pollination needed to support America's agriculture alone. However their role in pollination across the globe should not be overlooked.

I believe that it is increasing important to listen to hear the thoughts and ideas of other beekeepers. I am confident that working together in this issue a solution can be reached. I think that any person that has a idea that he or she feels could help deserves to

be heard. The problem must be acted upon, no matter what the solution. We as keepers and stewards of the bees must help them now if future generations are to experience the benefits of the honey bee. They have helped mankind and the plant world for years. We must do all we can to insure the survival of these pollinators even if it means re-thinking the way we have approached the problem up until now.

Endnotes:

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