

Best for bees to be stay-at-homes

July 14 2014, by Janne Hansen



Local bees manage better than imported bees, according to scientists from Aarhus University. Credit: Per Kryger

Honey bees with roots in the local environment manage much better in the struggle for survival than imported honey bees from foreign environments.

A world without bees would be a whole lot poorer – literally. In Denmark alone an additional 600 million to 1 billion Danish kroner are

earned annually due to the work done by bees making honey and pollinating a wide range of crops from apples to cherries and clover.

Unfortunately, bees all over the world are under pressure from pesticides, mites, viruses, bacteria, fungi and [environmental changes](#), among other things. The problems often lead to the syndrome Colony Collapse Disorder, which can cause whole bee colonies to fall apart.

Scientists from, among others, Aarhus University, have now found that bees that are adapted to the local environment fare much better with regard to meeting the challenges than bees that have been purchased and imported from a completely different home area. The scientists determined this by investigating the interaction between the genetic makeup of honey bees and their environment. Even though quite a lot is known about the geographical and genetic diversity of honey bees, knowledge of how honey bees adapt to the local environment has been limited until now.

"Many beekeepers believe that it is best to buy queens from outside instead of using the queens they have in their own beehives. However, there is increasing evidence that the global honey bee trade has detrimental effects, including the spread of new diseases and pests," says senior scientist Per Kryger from the Department of Agroecology at Aarhus University.

Local or exotic queen?

Productivity in beehives is typically measured by how much honey the bees produce. The desire to maximise earnings by importing bees changes the natural genetic diversity. The question is whether commercial [honey bee](#) strains are actually more productive, all things considered. There is not much point in having a highly productive strain if it succumbs to Colony Collapse Disorder.

The studies were carried out in 621 colonies of honey bees with 16 different genetic origins. The beehives were set up in 11 countries in Europe. There was one local strain and two foreign strains of honey bees at each of the locations.

The factors that had the greatest influence on the survival of the bees were infection with varroa mites, problems with the queen, and infection with the disease nosema. Colonies with queens from the local environment managed on average 83 days more than colonies with queens from foreign areas.

"It is very clear that the local bees fare better than imported ones and that they live longer. It is not possible to point at one single factor that gives the local bees the advantage, but it appears to be an interaction between several factors," says Per Kryger and continues:

"Our results indicate that the way forward is to strengthen the breeding programmes with local honey bees instead of imported queens. That would help maintain the bee population's natural diversity. It would also contribute to preventing the collapse of [bee colonies](#), optimise sustainable productivity, and make it possible to maintain continual adaptation to environmental changes."

The results of the project regarding the interaction between the genetic makeup of bees and their environment have been published in a special issue of the *Journal of Apicultural Research*, which is published by the International Bee Research Association.

More information: www.ibra.org.uk/articles/JAR-53-2-2014

Provided by Aarhus University

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