

'Bee Box' provides stress-free insight into hidden life inside the hive

August 31 2021



L-R: One of the prototype bumblebee nests, and a bumblebee. Credit: Dr Philip Donkersley

Researchers seeking ways to discover more about bee behavior without disrupting the nest have built the world's first 'wild bee nests' with built-in webcams.

Lancaster University Environmental Scientist Dr. Philip Donkersley, working with Engineer Jenny Roberts CEng, developed prototype bumblebee nests after being inspired by bird boxes with built in cameras.

Using 3D printing and molding, they created a light-proof chamber with a small narrow entrance pipe. Once buried beneath ground, the prototype

dome-shaped nests have already proven to be popular with [queen bees](#) on the hunt for a safe place for a [nest](#).

Robust enough to withstand the elements, the nests offer a safe potential nesting site which can even withstand the attention of large mammals such as cows.

And because the nests already have cameras installed in them before being put in the ground, it's possible to see what the bees are up to without the need to disrupt or distress their colony.

The researchers hope the nests will be the first of many, offering a glimpse of life inside the hive to environmental scientists, conservationists, wildlife-friendly gardeners and the [general public](#) alike.

They are also talking to pest control companies who remove bumblebees from buildings, offering the nests as a 'rehoming' rather than 'pest control' solution.

Dr. Donkersley has installed one of their early prototypes in his own garden. Fitted with a camera complete with infrared lighting and powered and processed by a Raspberry Pi computer, the nest is now colonized by 'bombus terrestris' bees and the researchers are already streaming the live footage via Youtube.

Dr. Donkersley, who has researched how landscapes affect bee biology says that they "were advising a film crew on a project to film some very rare arctic bees—however there was no safe way to introduce a camera without damaging the nest. This got us thinking. My father-in-law had recently bought a bird box with a camera already installed and it seemed the obvious thing to do to try to design something that would work for wild bumblebees."

The team behind the bee cam nests have received Engineering and Physical Sciences Research Council (EPSRC) Impact Acceleration Account funding for the project to produce 100 nests and hope to go on to produce more.

By deploying these artificial nests across a range of locations, Dr. Donkersley wants to answer one of the most important things we still don't know about bumblebees how and why they choose their nest sites, as well as helping to boost species numbers by providing extra potential nest sites. He also hopes to one day see them on sale to the general public.

Dr. Donkersley said the bee boxes provided the missing half of bee 'Bed and Breakfast'. "One of my biggest bugbears about bee conservation is that we are always planting more food for them, but rarely doing any work on providing nesting sites for wild [bees](#). These beehives are going to address that for agricultural and [urban areas](#)."

Jenny Roberts, Lecturer in Mechanical Engineering at Lancaster University says that "there is huge public and media interest in bee and pollinators, so much of our food security depends upon them and this was a great opportunity to work on a product that will provide further insights into their behavior, increasing our understanding and appreciation of these remarkable insects."

Provided by Lancaster University

Citation: 'Bee Box' provides stress-free insight into hidden life inside the hive (2021, August 31) retrieved 23 June 2024 from <https://phys.org/news/2021-08-bee-stress-free-insight-hidden-life.html>

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