

Bumblebees found to do better in urban settings than in agricultural areas

27 June 2018, by Bob Yirka



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A team of researchers with the University of London and Imperial College London has found through field experiments that bumblebee colonies tend to do better in urban environments than agricultural environments. In their paper published in *Proceedings of the Royal Society B*, the group describes their study and what they found.

Bumblebees are generally considered to be one of the friendlier bees that people encounter. Despite their large, round size, they tend to elicit less fear due to their non-threatening behavior. And according to a study done by the team in Britain, they also appear to find more success in urban areas than they do in agricultural areas. They came to this conclusion by conducting an extensive field study.

The study consisted of capturing queen bees in a local park and putting them into [nest boxes](#) where they laid eggs. The nest boxes were then placed at 38 sites between Basingstoke and London and monitored for approximately 10 weeks—the average lifespan of a [bumblebee](#) colony. Each

colony received a visit once a week—at night when all members would be present. During each visit, the researchers counted all members of the [colony](#) and noted how much nectar and pollen had been stored. They also removed cuckoo bumblebees (other bee species that lay their eggs in bumblebee colonies) and gynes (males capable of reproducing).

The researchers found that that [bumblebee colonies](#) in cities produced far more males and gynes than did those in agricultural areas. They also found that both city and village colonies had much higher populations than the agricultural colonies. Those colonies located in [agricultural areas](#) also tended to have more cuckoo bumblebee invasions.

The researchers were not able to say for sure why the bumblebees appeared to do better in urban and village settings, but suggest it could be due to a variety of factors. Agricultural areas tend to have crops that only bloom for a short time, they note, and which are exposed to pesticides and other toxic chemicals. Cities and villages, on the other hand, have a wide variety of flowers that bloom at different times.

More information: Ash E. Samuelson et al. Lower bumblebee colony reproductive success in agricultural compared with urban environments, *Proceedings of the Royal Society B: Biological Sciences* (2018). [DOI: 10.1098/rspb.2018.0807](https://doi.org/10.1098/rspb.2018.0807)

Abstract

Urbanization represents a rapidly growing driver of land-use change. While it is clear that urbanization impacts species abundance and diversity, direct effects of urban land use on animal reproductive success are rarely documented. Here, we show that urban land use is linked to long-term colony reproductive output in a key pollinator. We reared colonies from wild-caught bumblebee (*Bombus terrestris*) queens, placed them at sites

characterized by varying degrees of urbanization from inner city to rural farmland and monitored the production of sexual offspring across the entire colony cycle. Our land-use cluster analysis identified three site categories, and this categorization was a strong predictor of colony performance. Crucially, colonies in the two clusters characterized by urban development produced more sexual offspring than those in the cluster dominated by agricultural land. These colonies also reached higher peak size, had more food stores, encountered fewer parasite invasions and survived for longer. Our results show a link between urbanization and bumblebee colony reproductive success, supporting the theory that urban areas provide a refuge for pollinator populations in an otherwise barren agricultural landscape.

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