

Poor diet may contribute to the decline in British bees

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Bees

The changing British landscape could be contributing to the decline in our bee populations, according to Lancaster University research.

Analysis of 35 hives in 20 sites in North West England found that honeybees living near areas of extensive farmland were surviving on a lower [protein diet](#) than those in hives near [natural grasslands](#) and woodlands.

Bees consuming less protein early in life may be left vulnerable to other factors such as pesticides, disease or harsh winters. Poorer quality diets could, in part, explain why honeybee populations are in decline.

Bees depend on [pollen](#) and nectar for their food which they acquire from a range of flower species.

Whilst nectar is converted to honey in the hive, pollen is converted to "beebread", which is consumed by the growing young brood.

To conduct their study, the researchers regularly analysed the composition of 'beebread' in different hives – testing its nutritional value throughout the summers of 2012-13.

By combining these data with extensive land-use data generated by Countryside Survey 2007, they found that beebread [protein content](#) was lower in areas where arable and horticultural farmland surrounded the hives, but beebread found in [hives](#) near natural grasslands and broadleaf woodlands had higher [protein levels](#).

Protein levels in beebread vary because not all pollen is equal. Some species of plant produce pollens naturally very high in protein, and some not so. Previous studies suggest that the protein content of pollen varies across plant species from around 2.5% to 62%.

The finding that beebread protein content is correlated with land use suggests that landscape composition may impact on the well-being of bees.

Philip Donkersley, who led the research at Lancaster University's Environment Centre, said: "Honeybees have different nutritional requirements at different stages of their lives, with larvae primarily requiring protein. We already know from previous studies that larvae with lower dietary protein intake may not live as long and may have reduced immune function. This study shows a clear link between landscape and the nutritional ecology of insects."

"We don't suggest that we need to get rid of farming to solve this problem – rather that by modifying the food sources available to bees in agricultural areas we could improve their diet and their chances of survival, which could increase their capacity to pollinate crops."

More information: "Honeybee nutrition is linked to landscape composition." *Ecology and Evolution*. Article first published online: 14 OCT 2014. DOI: 10.1002/ece3.1293

Provided by Lancaster University

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