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Planting more hedgerows and trees could hold the key to helping UK bees thrive once again, a new study argues.

And researchers suggest artificial intelligence could be used as a tool to design our landscapes so that trees, hedgerows and wildflowers are planted in the right place and the right numbers to ensure our pollinators have enough food.

It is well known that bees and other important insects, which are vital for pollinating our plants and food crops, are in long-term decline across Europe.

One of the major causes of the reduction of our pollinators, such as honeybees, bumblebees, solitary bees and hoverflies, is the degradation of suitable habitats. A process that scientists claim is accelerated by modern farming practices.

Efforts, including the planting of large strips of wildflowers on the margins of agricultural land, are under way to try to reverse this long-term decline.

However, researchers believe that tree and hedgerow planting could be a more efficient and cost-effective tactic, alongside the planting of wildflowers.

Trees are preferable to bees, and other pollinators, because they offer greater food density—there are more flowers within a relatively small area on a blooming tree, compared with flower meadows.

This makes trees a more efficient foraging ground for bees, and scientists have found bees show preference to trees—collecting a large proportion of their diet from woody species.

Trees and hedgerows also have a secondary benefit. They provide physical landmarks, like points on a map, which pollinators use to navigate their way across the landscape from their hive to foraging grounds.

Trees and hedgerows also provide nesting, overwintering and sheltered habitat—offering shelter during wind and rain.

Unfortunately trees and hedgerow cover has declined in the UK over the last 500 years.

Dr. Philip Donkersley, of Lancaster University and author of the study, said: "Given how great these resources are for pollinators, their loss could easily be a contributing factor to our current pollinator crisis across the world.

"By removing these key resources from the environment, and making insufficient efforts to replace them with wildflower strips, we are effectively starving our pollinators of food and places to nest."

Dr. Donkersley proposes the creation of new artificial intelligent algorithms to help redesign the landscape. He believes computers could tell farmers, and other landowners, where to most efficiently, and cost-effectively, plant trees and hedgerows, along with wildflowers, to provide plentiful food and landmarks for pollinators to thrive.

"Machine learning algorithms could be used to design landscapes that provide the best access to resources and the most information to pollinators, while at the same time taking up the least amount of space, time and money for land owners," he said. "The best option could be planting 100 trees in the corner of a field rather than kilometres of wildflowers.

"This I hope will encourage easy-fixes for landowners on a strict budget who want to do the most efficient conservation effort for pollinators without breaking the bank."

The study is outlined in the paper 'Trees for Bees' which is published in the journal *Agriculture, Ecosystems and Environment*.

More information: Philip Donkersley, Trees for bees, *Agriculture, Ecosystems & Environment* (2018). DOI: 10.1016/j.agee.2018.10.024

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