

# Nutrition needs drive bee appetites: New research findings may help to boost pollinator health, resilience

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Bumble bee foraging for pollen from a prickly poppy. Credit: Anthony Vaudo, USDA Forest Service

Most garden enthusiasts know that certain flowers can attract pollinators. New research helps explain why and also provides more details about how the nutrition found in plant pollen may determine which specific bee communities might favor your garden. On a larger scale, this research may help fight against pollinator declines through better design of rangeland restoration projects.

Scientists at the USDA Forest Service's Rocky Mountain Research Station and the University of Nevada, Reno studied the foraging habits of wild bees. [Their findings](#), published in the *Proceedings of the National Academy of Sciences*, can help guide seed and plant choices that support and enhance wild bee populations. In short, their research showed that different bee species have different nutritional needs. Given that not all pollens are the same, bees forage accordingly to meet their unique needs.

"Nutrition is widely recognized as a key factor in addressing pollinator declines, and plants vary in the protein and lipid content of the pollens they offer to bees," said lead author Dr. Anthony Vaudo, a research biological scientist at RMRS. While nectar also provides nutrients, Vaudo focused on pollen [nutrition](#) because larvae are dependent on pollen for development.

"We wanted to bring focus to that aspect of nutrition and foraging and its direct effects on the health of the developing bees," he added.

Researchers sampled the proteins and lipid content of the pollens of 109 [plant species](#) in the Great Basin region that generally bloom in the same area at about the same time, providing a snapshot of the nutritional landscape. The team observed the patterns of 75 varieties of pollen-collecting bees and found that the nutritional content of pollens in [plant communities](#) predicted which bee communities the plants would attract.

They determined that plants within related genera can offer similar

[pollen](#) nutrition and are functionally similar for bees. This information may be used to predict how a bee may choose a different host plant in a new environment. The research team also found that many bees do not have allegiance to a particular plant family or genus, and that there was a more basic nutritional reason for which plants bees preferred. The research has particular relevance for the selection of seeds used for conservation of bee habitat and plant communities.

Vaudo said, "This has exciting opportunities for future restoration research and could change the way bee communities can be conserved or improved. For example, designing a [restoration project](#) with more nutritionally diverse plants and testing to see if they attract more bees or a higher diversity of bees.

"One interesting feedback loop is that increased pollination can lead to increased seed production. This idea of nutritional diversity can support healthier bee populations and hopefully provide resilience in changing environments," he added.

Vaudo credits his co-authors from the Department of Biology at the University of Nevada, Reno for their critical contributions to the project. Dr. Anne Leonard's background in behavioral studies provided the "bee perspective" and consideration of community behavior. Dr. Lee Dyer developed appropriate statistics to analyze the data.

**More information:** Vaudo, Anthony D. et al, Pollen nutrition structures bee and plant community interactions, *Proceedings of the National Academy of Sciences* (2024). [DOI: 10.1073/pnas.2317228120](https://doi.org/10.1073/pnas.2317228120). [doi.org/10.1073/pnas.2317228120](https://doi.org/10.1073/pnas.2317228120)

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