

# Diet matters: The effect of a common fungicide on bumblebees depends on floral resources



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## Agricultural practices and bee health

**Fungicides** are commonly applied to crops in bloom, therefore their effects on bees should be investigated. Another stressor for bees is the reduced floral abundance or a lack of floral diversity that can be seen in agricultural landscapes. Flowering plants differ in the nutrients they provide. **Monocultures** consisting of only one crop plant might therefore be another stressor for bee health. How multiple stressors affect bees in **combination** is rarely studied.

## Testing the effect of nutrition and a fungicide on bumblebees

In 39 large flight cages (a semi-field experiment) either buckwheat, purple tansy or a floral mixture was grown. In each cage one colony of the buff-tailed bumblebee was placed. About half of the cages were treated with a common fungicide (**amistar**, active ingredient: **azoxystrobin**) and the others were sprayed with water only.

**Buckwheat**  
Low-protein pollen

**Purple tansy**  
High-protein pollen

**Floral mix**  
Variable protein content

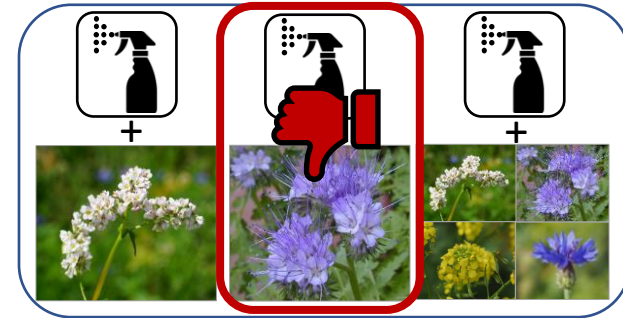


## Results

**Nutrition:** bumblebee colonies in buckwheat monocultures generally developed poorly compared to colonies foraging on purple tansy or a floral mixture.



**Effect of fungicide exposure:** The fungicide applied in purple tansy reduced colony growth and the number of males produced. Also the body mass of workers was lower compared to colonies in purple tansy cages sprayed with only water. In buckwheat and floral mix cages, no effect of the fungicide was observed.



## Diverse habitats are urgently needed to buffer negative effects of pesticides!

Bumblebee colonies only performed consistently well in the flowering mix. In contrast, monocultures either reduced bumblebee health directly or failed to buffer the negative effects of a fungicide. If we bring diverse flowering habitats back into agricultural landscapes, we can help bumblebees and other bees by making them more resistant to pesticides.

## PoshBee publication

Wintermantel, D., *et al.* (2022): Flowering resources modulate the sensitivity of bumblebees to a common fungicide. In: *Science of the Total Environment* 829, 154450. [Link](#)

