

Growers can do something to attract bees to orchards

Far more solitary bees than social bumblebees and honeybees were caught in pan traps in apple trees in 2016. Virtually all the solitary bees were ground nesting bees. Solitary bees require nesting sites and the fruit growers can do something to increase the number of sites.

2016.12.19 | POST DOC LISE HANSTED & RESEARCH TECHNICIAN HENNING BANG MADSEN, UCPH



Solitary bees, bumblebees and honeybees are effective pollinators of apple flowers and they are crucial for a good fruit set. To get an accurate picture of bees and their distribution, detailed studies in nine apple orchards were done in 2016. A total of 29 bee species distributed among seven genera were found in five pan traps which were set up in each orchard for two weeks around flowering. The vast majority of bees (87%) were solitary and the rest were social bees (11% honeybees and 2% bumblebees).

Life cycle important for bees during apple flowering

In May when the apple trees bloom, bumblebees are not yet as numerous as later in the season. The overwintered bumblebee queens are in the process of finding and building new nests and only few worker bumblebees have emerged. This may explain the small number of bumblebees found in the pan traps in the orchards during flowering. Similar results were obtained in 2015 at farm level, where there were fewer bumblebees in spring as compared to summer and late summer. Several of the solitary bees, for example many *Andrena* and *Halictus* species, hibernate as mature bees. They emerge in early spring, build their nests and are fully active during apple flowering.

Mostly solitary ground nesting bees in apple orchards

The vast majority (99%) of the solitary bees caught in the orchards excavate their nests in the ground and only 1% nest in existing holes above the ground. This may indicate that mostly ground nesting bees are attracted to apple orchards. However, there might simply not be enough nesting sites for species which nest in existing holes above ground. Regardless, it is an area where the fruit growers can improve nesting conditions for both types of bees. Areas with preferably sandy soils in sunny locations with sparse vegetation and patches with dead wood or brushwood can enhance nesting opportunities greatly for solitary bees. Foraging distance for most of the solitary bees is short, so the closer the nests are to the apple trees, the greater are the chances that they will visit the flowers.

The ground nesting bee, *Andrena haemorrhoa*, was the most common bee. It was the only species found in all the pan traps in the apple trees and it was the most numerous wild bee (24-76% of individuals in the trees). It also appears that there were far more *A. haemorrhoa* in pan traps in apple trees compared to pan traps set up outside the orchards at 100 and 250 meters from the center. It is perhaps a bee which is more readily attracted to apple flowers than other wild bees.

Large variation between orchards

In total, 906 bees were collected from the pan traps in the 9 orchards during apple flowering: 571 *Andrena* (13 species), 20 *Bombus* (5 species), 81 *Halictus* (2 species), 129 *Lasioglossum* (7 species), 1 *Nomada*, 8 *Osmia* (1 species) and 96 *Apis* (honeybee). The variation in number of bees between the orchards was large (43-205 bees per orchard). For wild bees without the honeybees the difference was tenfold (19 to 201 wild bees per orchard).

Honeybee colonies were placed in all the orchards. The wild bees are a valuable "free" resource, and much can be done to improve their conditions.

About BeeFarm

The project Beefarm is part of the Organic RDD 2 program, coordinated by ICROFS (International Centre for Research in Organic Food Systems). It has received grants from the Green Development and Demonstration Programme (GUDP) under the Environment and Food Ministry.

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REVISED 09.05.2018