PRACTICE ABSTRACT

Using biodiversity to stimulate wild bees in the orchard

Problem

Good pollination is essential in fruit growing. With changing climatic conditions, adverse weather conditions are more common during flowering. A mix of different pollinators is important to ensure the pollination.

Solution

Many wild bees including mason bees like the European orchard bee (*Osmia cornuta*) and the Red mason bee (*Osmia bicornis*) are effective pollinators in fruit production. Their presence can be stimulated by offering nest boxes and biodiversity in the orchard.

Benefits

Promoting pollinators improves pollination and leads to a better guarantee of yield and fruit quality.

Applicability box

Theme

Crop production, Temperate fruits, Climate

Keywords

Climate change, Pollinators, Pit fruit, Stone fruit

Application time

Two weeks before bloom

Equipment

Nest boxes, material to remove and clean cocoons and nest boxes, cocoons of mason bees

Best in

Biodiversity-rich orchards

Practical recommendations

- Mason bees fly at lower temperatures and in worse weather conditions than honey bees
- When you have your own mason bees, place **nest boxes** and cocoons in the orchard two weeks before fruit blossom.[2,2]
- Provide an orchard with **flowering** trees/shrubs, and perennial or annual flowers during the whole season
- For mason bees especially **early flowering** is important, before & after the blossom period of fruit trees. Mason bees' males hatch earlier than females. Make sure there are flowers in the orchard for the males' flight.
    - Early flowering trees and shrubs are: hazelnut, willow, yellow dogwood and Prunus.
    - Early flowering bulbs that are attractive for mason bees are: grape hyacinth (*Muscari armeniacum*), and siberian squill (*Othocallis siberica*).
    - Early spontaneous flowers that are frequently visited by mason bees are: dandelion (*Taraxacum officinale*), lungwort (*Pulmonaria officinalis*), lesser celandine (*Ranunculus ficaria*), ground ivy (*Glechoma hederacea*), coltsfoot (*Tussilago farfara*) and common field-speedwell (*Veronica persica*).

European orchard bee on grape hyacinth (1). Lungwort (2). Spontaneous flowers in the orchard: common field-speedwell (3) and ground ivy (4). Photo 1, 3. G. Brouwer, Delphy. Photo 2, 4. W. Cuijpers, Louis Bolk Instituut.

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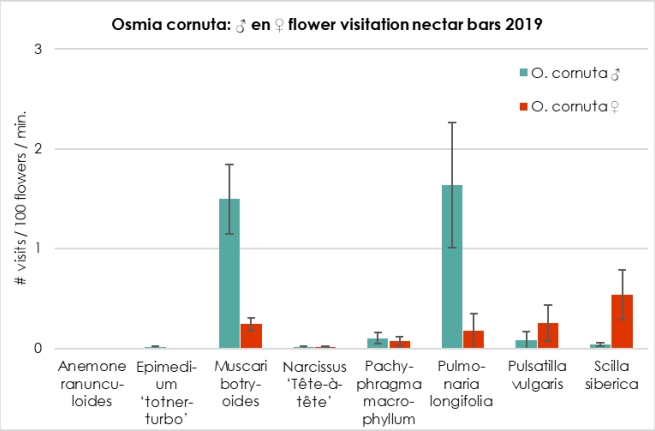

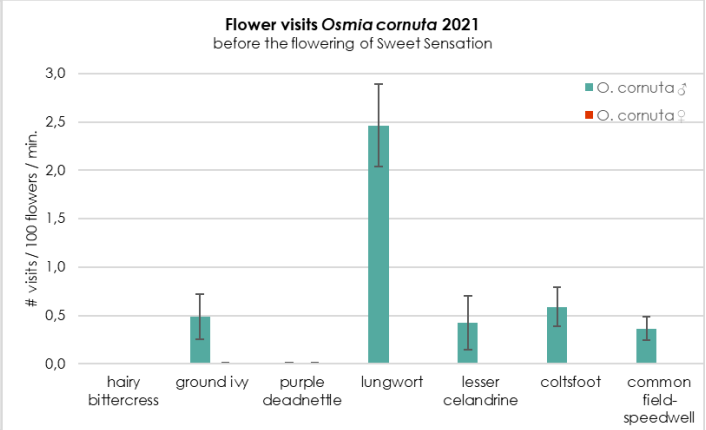

Research on the suitability of flowers as nectar and pollen suppliers in early spring (2019 and 2021). Flower visits of Osmia cornuta were recorded. In 2019 various bulbs were planted, favourite were grape hyacinth and siberian squill. In 2021 the visits on wildflower species were recorded, prior to the flowering of the pear variety Sweet Sensation. Favourite species were lungwort (*Pulmonaria officinalis*), lesser celandine (*Ranunculus ficaria*), ground ivy (*Glechoma hederacea*), coltsfoot (*Tussilago farfara*) and common field-speedwell (*Veronica persica*). Dandelions were not tested because they are known to be well visited by mason bees. Hairy bittercress (*Cardamine hirsute*) and purple deadnettle (*Lamium purpureum*) were not visited by mason bees. W. Cuijpers, Louis Bolk Instituut.

Further information

Videos

- BIOFRUITNET video: Mason bees for successful pollination in closed cherry orchards (DE, subtitles in EN, FR, IT, ES, DK, NL, LV, PL, TR, CZ, SK)
- Delphy: Uitzetten van metselbijen (Dutch)
- Delphy: Oogsten van metselbijen (Dutch)

Further reading

1. Boutry, C. 2022. Use of mason bees for pollination in covered orchards. FiBL. BIOFRUITNET
- Brouwer, G., Cuijpers, W. 2022. Metselbijen inzetten in de fruitteelt. pp. 1-79. (Dutch)
2. Jacquot, M., Parveaud, C.-E. 2022. Nesting boxes: Improve tree pollination with wild bees. GRAB. BIOFRUTINET.
- van Breugel, P. 2019. Gasten van bijenhotels. EIS Kenniscentrum Insecten en andere ongewervelden & Naturalis Biodiversity Center. pp. 486. 222. (Dutch)

Weblinks

- Bestuivingsmix en biodiversiteit in de boomgaard (Dutch)
- Check the Organic Farm Knowledge platform for more practical recommendations
- Adolphi, C., Oeser, N. 2022. Practice abstract Insect boxes in organic orchards: Caution on ready-to-use solutions! FÖKO. BIOFRUITNET

About this practice abstract

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