

Use of mason bees for pollination in covered organic orchards

Problem

Good pollination is essential for fruit yield and quality. However, the population of bees (honeybees, wild bees), the primary pollinators, is decreasing. Pollinators are often present in too few numbers in intensive fruit orchards, also organic ones.

Solution

Mason bees, which fly at lower temperatures (4°C on) compared to honeybees, are placed into the orchards just before flowering to improve pollination.

Benefits

Using mason bees can ensure optimal pollination in intensive fruit orchards when naturally occurring pollinators are not (yet) present or are too few.

Applicability box

Theme

Crop production, Horticulture, Temperate fruits

Keywords

Temperate fruits, pollinators, functional biodiversity, mason bees

Context

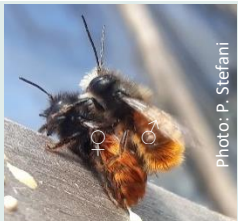



Intensive (covered) fruit orchards

Application time

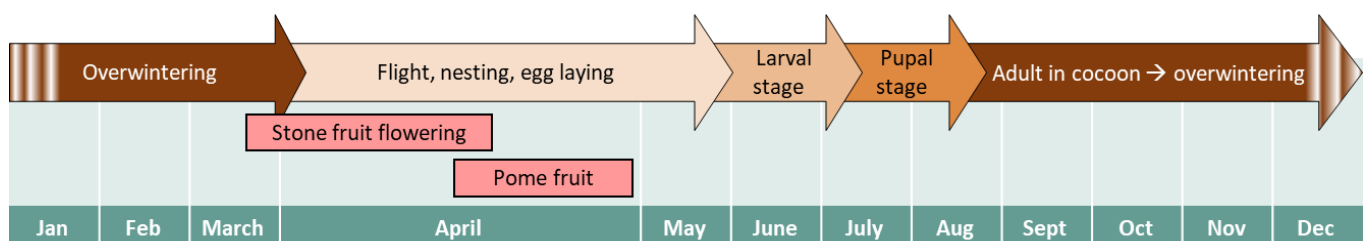
At flowering

Practical recommendations

The two most important managed wild bees for fruit crops pollination are the European orchard bee (*Osmia cornuta*) and the Red mason bee (*Osmia bicornis*), both mason bees (life cycle: see Picture 1):

	Female (♀) and male (♂) mason bee	Aspect of the cocoon	Time point of application	Length of hatching	Comments
European orchard bee (<i>Osmia cornuta</i>)	 Photo: P. Stefani		3 days prior to flowering*	10 days	Suited for early flowering fruit species like stone fruit (apricot, cherry, plum).
Red mason bee (<i>Osmia bicornis</i>)	 Photo: A. V. Wath		10 days prior to flowering*	10-25 days	Hatches a bit later than the European orchard bee and is therefore suited for medium to late flowering fruit species like pome fruit (apple, pear) and berries .

*Depending on the temperature, the European orchard bee (*Osmia cornuta*) hatches after 3-4 days of their release and the Red mason bee (*Osmia bicornis*) after around 10 days.



Picture 1. The life cycle of the European orchard bee and the Red mason bee.

Release mason bees

- Place one or more nesting boxes (Picture 2) on the inner edge and within the orchard (1 m above ground) so that they face the tree rows and can easily reach the flowers, possibly oriented south or southeast.
- Mason bees fly in a perimeter of 50-200 m, so adapt the number and placing of the nesting boxes accordingly. Around 2000 cocoons (2-3 nesting boxes) are needed to pollinate a low-stem fruit orchard of 1 ha.
- Place the overwintered cocoons in the nesting box so they are protected but can also fly out (e.g., a carton box with exit holes).



Picture 2: Nesting box for mason bees (left). Mason bees need holes for nesting (right). Photos: P. Stefani.

Where to get mason bees

- Subscription to mason bee rental service (check online if there is a mason bee rental service for your country, e.g., www.pollinature.net), or
- Maintain and propagate mason bees yourself (see further reading (1)).

Further information

Video

- BIOFRUITNET video: [Mason bees for successful pollination in closed cherry orchards](#). (DE, subtitles in DE, EN, FR)

Further reading

1. Stefani, P., Häseli, A., Gurten, S. 2022. [Mauerbienen züchten - Bestäubung in Obstkulturen stärken](#). pp. 1-8. (DE, FR)
2. Pfiffner, L., Müller, A. 2016. [Wild bees and pollination](#). pp. 1-8. (EN, DE, FR)
3. Pfiffner, L., Müller, A. 2018. [Wildbienen fördern – Erträge und Pflanzenvielfalt sichern](#). pp. 1-8. (DE)
4. Pfiffner, L., Jamar, L., Cahenzli, F., Korsgaard, M., Swiergiel, W., Sigsgaard, L. 2018. [Perennial flower strips – a tool for improving pest control in fruit orchards](#). pp. 1-16. (Many languages)

Weblinks

- Check the [Organic Farm Knowledge](#) platform for more practical recommendations.

About this practice abstract

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