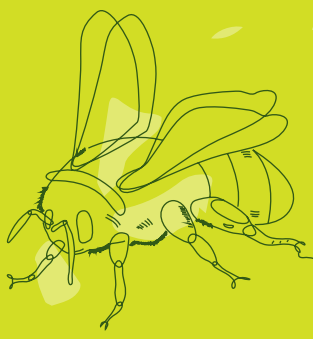
biobest
SUSTAINABLE CROP MANAGEMENT

Biological pollination

with bumblebees



Personalised solutions,
trusted advice
Biobest, naturally!

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Benefits of pollination with bumblebees

- Higher fruit production & quality
- Available all year round
- Excellent pollinators under difficult circumstances
  - From 5°C and up
  - Cloudy weather
  - Windy weather
  - Lower light intensity & diffuse light
- Versatile workers
- Less flower discrimination
- Tremendous labour savings

Let our bumblebees do the job

A bumblebee's journey

The bumblebee life cycle starts in spring, when a queen initiates a new colony after hibernation.
Larvae emerge from her first batch of eggs after 4 to 5 days. In the beginning, the queen does all the foraging herself. The larvae are fed with a mixture of nectar and pollen gathered from flowers. When the first adult workers appear, the queen no longer leaves the nest.
The workers begin to forage and take care of the brood. After the production of 150 to 400 workers, the queen starts to produce young queens and drones (males). From that moment onwards the activity of the colony decreases; the old queen stops laying eggs and eventually dies. With a young, mated queen who will hibernate alone, a new cycle begins.

Proper pollination of crops is essential for optimal fruit set and production. In the past, growers relied on honey bees, manual pollination or plant growth regulators, depending on the crop. Nowadays, bumblebees offer the best possible solution for efficient pollination of a vast variety of crops!

Higher fruit production and quality

In crops, such as tomatoes, peppers, blueberries, etc. bumblebee pollination results in higher yields as well as larger and higher quality fruits.

Excellent pollinators

Bumblebees have a larger body size and hairier bodies than honey bees, which allows for higher pollen loads and a better contact with the flowers' reproductive organs. This results in a highly efficient plant pollination. Compared to honey bees, they also visit more flowers during a single foraging trip. An additional benefit is that they can "buzz pollinate" plants such as tomato and egg plant: they grab on to the anthers of the flower and vibrate their wings to ensure that pollen is released. Honey bees are not able to do this.

Work under difficult circumstances

Unlike honey bees, bumblebees are also active at low temperatures (5°C/41°F), as well as under windy and/or cloudy conditions. Biobest bumblebees are available throughout the year and as such the most reliable solution for pollination of both early and late season crops.

Versatile workers

Bumblebees are not only excellent pollinators in open air, but are especially valuable in greenhouses and plastic tunnels.

Less flower discrimination

Bumblebees are less opportunistic feeders than honey bees, therefore they tend to focus more on pollination of the direct surroundings of their hive and search less for a distant bounty that hinders the pollination of the nearby crop.

Tremendous labour savings

Bumblebees can completely replace manual pollination and the use of hormones, reducing manual labour to a minimum.

The Biobest bumblebee hive

Biobest's bumblebee hive is a maintenance-free, easy to monitor, safe and simple hive. Applying the latest technologies it optimizes the efficacy of Biobest bumblebees. As such it fully meets the wide range of requirements for application in a variety of crops.

The hive consists of 5 main elements:

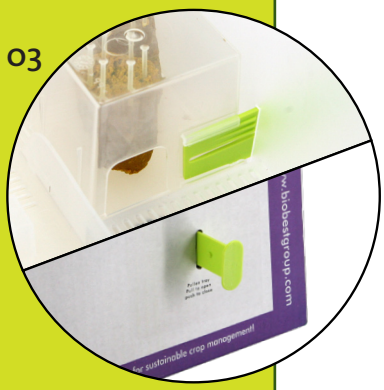
01 Nest box

The nest box or brood box contains the actual hive with the brood (eggs, larvae and pupae). This plastic box has several ventilation openings in the walls, lid and bottom. The honeycomb structured grid of the lid provides improved ventilation and prevents condensation. An integrated ridge in the interior of the frame amplifies the sound of the colony which helps bumblebees find the way back to their hive.

02 Feeding system

Bumblebees mainly forage for two food sources:

- Pollen as a protein source for larval development and to build up the colony
- Nectar as a carbohydrate (sugar) source for energy.
  In particular crops, the flowers produce insufficient or even no nectar (e.g. tomatoes). In these cases the colony needs to be provided with a supplementary sugar solution. Biogluc®, a ready-to-use food solution developed by Biobest, is of a sugar solution with preservative. A Biogluc® container, sufficient for the entire life of the colony, is situated underneath the plastic nest box. Thanks to the capillary action of the feeding system, bumblebees can feed on the Biogluc® under perfectly hygienic circumstances.

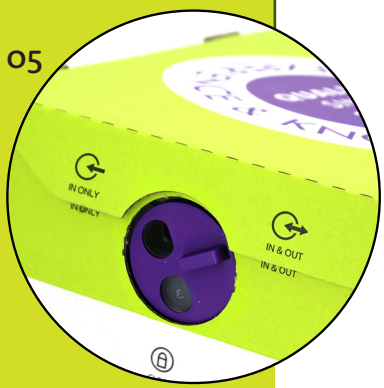


03 The pollen tray (Not in every hive)

Under certain circumstances (e.g. longer storage or transport) the colony may need to be fed with pollen. Inside the nest box an ingenious and newly developed tray provides bumblebees with pollen. The unique Biobest pollen tray system can be opened and closed at any time using a sliding valve that is easy to operate from the hive's exterior. Bumblebees that are locked in the closed tray can easily crawl out through a conic exit tube.

04 Lid with unfoldable ventilation system

The nest box is placed in a sturdy cardboard box that provides protection from direct sunlight and water. It contains a well-designed ventilation system that is easy to set up when climatic conditions are unfavourable: when temperature or humidity is too high it helps the bees to regulate the climate inside the nest box and ensures the hive's activity and good brood development.



05 Flight opening and bee-lock

Each hive contains 2 flight openings opened and closed by a simple rotating knob. The standard flight opening on the right allows the bumblebees to freely exit and enter the hive. The left flight opening is a one-way opening, equipped with a tunnel and valve, through which the bumblebees can only enter. Thanks to the easy-to-use bee-lock system, the bumblebees can be 'collected' at any time during the day, e.g. when using artificial lighting. Its ingenious design makes the hive suitable for automatic lock-in systems.

Applications & Benefits

CROPS	BENEFITS OF BUMBLEBEES
Tomato	Higher yield per plant Larger fruits and higher fruit weight More seeds Better flavour Higher firmness
Blueberry	Higher yield per plant Larger fruits and higher fruit weight More seeds
Strawberry	Higher fruit weight More high quality fruits: reduced malformations Brighter red colour Higher firmness and increased shelf life Reduced susceptibility to post-harvest pathogens due to lower sugar-acid ratio
Apples	Larger fruits More seeds
Blackberry/Raspberry	Higher yield per plant Larger fruits and higher fruit weight
Sweet Cherry	Improved fruit set
Eggplant	Higher firmness Higher yield per plant
Sweet pepper	Higher quality fruits
Seed production	Increased seed size and weight
And many more crops!	

FOR MORE INFORMATION,
CONTACT YOUR LOCAL BIOBEST ADVISOR

BIOBEST OFFERS DIFFERENT TYPES OF HIVES FOR DIFFERENT CROPS.
PLEASE CHECK OUT OUR COMPLETE PRODUCT RANGE ON WWW.BIOBESTGROUP.COM.

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