

Sweet pepper

Flower biology

- The flower of sweet pepper (*Capsicum annuum*) is hermaphroditic and self-pollinating.
- The flower produces nectar as well as pollen.
- Bumble bee visits lead to self-pollination and to cross-pollination. Pollination by bumble bees may or may not be desirable depending on the variety and the season; in some varieties, and particularly in the summer, pollination by bumble bees may yield coarse fruit.
- The quantity of pollen on the stamens indicates to what extent the flower has been visited by the bumble bees: bare stamens signify adequate visits. In this case pollen grains can also be seen on the stigma.
- A shortage of flowers may lead to bumble bees "overvisiting" the available flowers. In their attempts to take the last pollen grains from the flowers, the bumble bees fasten their jaws onto the receptacle and set the flower into vibration by activating their flight muscles (without making flight movements with their wings). This is called buzz pollination and results in damage to the receptacle, which can later be found as cork-like spots on the pericarp.



Not pollinated



Pollinated

NATUPOL hive

- Although the sweet pepper flower produces nectar, it is not always sufficient for the full development of a bumble bee population. For this reason sugar syrup is supplied.

Introduction schedule

- For pollination of sweet pepper, LARGE colonies are normally used. On delivery, a LARGE colony consists of 80 to 110 worker bees. It has an expected life span of 4-6 weeks.
- The approximate pollination range per hive is 1,500 m². For smaller areas, another type of hive may be suggested by your consultant.

Use instructions

- Colonies should be introduced when the first flowers are open.
- Colonies should be placed on a sturdy support, about 50 cm above the ground; in spring in a sunny place, and later in the season in the shade.
- Secure the hive so that ants cannot enter it.
- After placement of the hive, let the bumble bees settle down for a while (½ - 1 hour) before opening the flight hole.
- Following their initial orientation flights the bumble bees will immediately start pollinating the crop.
- Bumble bees are active at temperatures between 10 and 30 degrees Celsius. They function best at temperatures between 15 and 25 degrees Celsius.

Crop protection

- Combining the use of bumble bees with natural enemies does not present any problems.
- Agricultural chemicals may have direct or indirect effects on the bumble bees. Direct effects occur when worker bees and larvae die as a result of contact with or digestion of a chemical product, and indirect effects occur when the smell of the treated flower puts off the bumble bees, causing visits to stop.
- Systemic pesticides (pesticides that are absorbed through the roots) often have a long-lasting residual effect. If a flower produces nectar in addition to pollen (e.g. sweet pepper), the damage to the bumble bee population may be much more serious than in a crop that only produces pollen (e.g. tomato).
- You will find detailed information about persistence and compatibility of pesticides with bumblebees and most other beneficials in **Zonda's Side Effects Guide** or online at Koppert's website: www.koppert.nl
- In all cases the BEEHOME option of the hive must be activated before the crop is treated. This option ensures that bumble bees can enter, but not leave the hive. After about an hour the hive can be closed completely, so that it can either be covered or removed from the crop.
- If the hive is temporarily removed from the crop, it should be stored at 18 to 20 degrees Celsius.