

## PROTECTION FOR BEE HIVES

# Clean-Living for Bees

Bee larvae grow in wax brood frames also used for storage. This is why these frames have to be kept free from disease-causing bacteria and residues. But sometimes the nursery area can become contaminated. This can now be quickly rectified thanks to a simple process.

**S**ome things go faster in man-made beehives than would be possible in nature. Insects normally build their own honeycombs, where their larvae develop, and honey and pollen are stored. But sometimes beekeepers offer assistance in the form of prefabricated brood frames. Obviously, these combined nursery and storage areas must be kept perfectly clean, which also means free from disease-causing bacteria and active substances. However, the current practice sadly lags behind aspirations, as Andreas Müller knows.

Müller is Managing Director of the company of the same name at Groß Süstedt in Lower Saxony, one of the biggest suppliers of beekeeping businesses. He must often deal with brood frames contaminated with active ingredients used to fight varroa mites. Removing these impurities has always been complicated – and expensive, but those days are over. With a new, simple process Müller can now effortlessly eliminate any contamination. Dieter Ulrich, an expert in Solids Processing and Waste-water Technology at Bayer Technology Services, developed the innovative process. The engineer made use of his expertise in solid-liquid separation and activated carbon for his patented invention. Knowing that this synthesized porous carbon material binds the organic pollutants found in water and air, Ulrich wondered if it would also bind undesirable impurities in honeycombs. Ulrich: “The technical challenge was to remove the activated carbon powder from the liquid wax with a suitable filtration process.”

The way to purified wax takes just five simple steps: First, the beeswax is melted. Five stainless steel vessels have been installed at Groß Süstedt for this purpose. They have a combined capacity of some 4,000 liters. Müller then adds activated carbon in powder form to the liquefied wax. The third step is the production of a homogeneous mixture, which is subsequently left to rest for 30 to 90 minutes. Afterwards, this suspension is filtered in a pressure filter under a pressure of four to six bar. What remains is clean wax, together with a concentrated filter cake containing the impurities, which can then be burned.

Andreas Müller is thrilled by this simple process that has since passed the first practical test in his company and now offers him a competitive advantage. “Finally, we can supply wax that is completely free of bacteria and impurities.”

## Hives in Danger

**V**arroat mites and why they are so dangerous

Varroat mites are the worst enemy of honeybees. This parasite made its way to Europe in 1977 – probably with imported bees. The mites sit on the brood and suck their blood.

Although nature has provided the insects with an effective immune system, as soon as the 1.7 millimeter varroat mite begins its blood sucking, the parasite

switches off the bee's immune system. Additional disease-causing viruses can infect the insect through the wound. The young honeybees are thus already weakened during hatching and die shortly thereafter.

In the meantime even the UN has raised the alarm: a recently published report of the UN Environment Program – UNEP – shows that bee mortality has now become a global problem. The UN even sees impending danger for basic human food resources.



In beekeeping the process of building honeycombs is greatly facilitated by adding a prefabricated brood frame about one millimeter thick.

**W**hen bees die, humans lose more than just honey

At least 100 commercially grown crops are currently pollinated almost exclusively by European honeybees. According to the FAO, the value of pollination by these useful insects is estimated at more than 200 billion dollars worldwide.

If increasingly more bee colonies are wiped out by diseases, the yields of many crops, including apples, peaches, raspberries, blueberries and rapeseed, will decline dramatically. Nowadays, hu-

mans would probably not starve without this pollination, but they would certainly be dependent on the wind. So, in a future world without honeybees, the wind will determine what we eat and how we dress.

**A** lot doesn't always help a lot – this is also true of controlling varroa

In their desperation, many beekeepers are now even turning to unregistered agents in the fight against varroa mites. Or in other cases, they are not keeping

to the applications recommended by manufacturers, which can result in residues in beeswax.

This is reason enough for some manufacturers of pharmaceutical products to do without beeswax altogether. However, wax that has been purified with the patented process developed by Bayer Technology Services can be used without hesitation. The wax treated with this method even meets the strict purity standards prescribed by law for raw materials used in pharmaceuticals.