THE SWEET LIFE FOR BEES

Sugarcane is an important crop. Insects may also be attracted to the remaining stumps of this sweet grass once it has been harvested. If they really do has long been unclear. Now, a study funded by Bayer has filled in this gap in knowledge, making it easier to protect bees and Co.

The sweet stalks are big business in Brazil: The South American country is the world's largest sugarcane producer. In 2013, this crop covered 9.8 million hectares – an area larger than Ireland. And the sweet grass is quite versatile: In addition to sugar, it can be made into ethanol fuel and the famous Brazilian liqueur Cachaça. The left-over fibrous matter, the so-called bagasse, is used to obtain energy and heat.

Insects may also be drawn to sugarcane, though not to collect nectar and pollen.

In fact, the plant is normally harvested before it even flowers. The stalks are then cut off close to the ground leaving short stumps. "The residual sweet sugar juice that comes out after the cane is cut may attract insects," explains Dr Christian Maus, Global Pollinator Safety Manager at the Bayer Bee Care Center. To protect the sugarcane from ground-dwelling pests, the remaining stubs are sprayed with insecticides. In this context, it also has to be ensured that harm to beneficial insects like wild bees, which still have further important pollination work to do for other crops, such as coffee, is avoided. Until now, scientists did not know for sure if honey and wild bees hang out in the sugarcane or at what time of day they may seek it out. "However, if we know whether bees can be found there and maybe even at what times, farmers can introduce insecticides at the optimal moment to avoid the bees. This makes it possible to both fight the pests and protect the beneficial insects," Dr Maus explains. The gap in knowledge is now being filled: In a study funded by Bayer, scientists from a partner laboratory investigated which, if any, bee species are attracted to the Brazilian sugarcane fields after the harvest.

AT A GLANCE

// After the sugarcane harvest, residual sweet juice runs out of the stalks and may attract insects to the fields.
// Pests are controlled using insecticides, but to avoid harm to beneficial insects it needs to be ensured that they are applied at the right time.
// A study funded by Bayer investigated which bee species are found at what time in Brazilian fields after the sugarcane harvest.

After harvesting, only stumps (left) remain on the sugarcane field. These are sprayed with insecticides to protect them from ground-dwelling pests. But the residual sugar juice leaking from the cuts may attract beneficial insects such as stingless bees (right), so it has to be ensured that harm to them is avoided.

SWEET ENERGY

Biofuel from sugarcane is a hot topic in Brazil. These perennial grasses, which grow as tall as a man, can be used to produce many things besides sugar and ethanol fuel for vehicles. The fibrous material that is left over after the sugar juice is pressed out also supplies energy for electricity and heat.

740 million tons

have been harvested in Brazil in 2013.

Source: FAO

Brazil is the world's largest sugarcane producer. The sugar juice of the harvested sweet stalks also attract bees, as a study funded by Bayer found out. It was conducted in two of Brazil's large farming regions: Paraná and São Paulo.

The study was conducted in two of Brazil's large farming regions in the south of the country, Paraná and São Paulo, where more than half of the country's sugarcane is produced. On a total of 16 fields, the researchers investigated which species come to feast on the sweet cane juice after the harvest. To do this, they identified and counted bee species in the field on different days and at different times of day between October and December. When taking inventory, scientists made sure to collect data in the middle of the field as well as at the edge and about five to ten meters outside the cultivated area.

The result: "On both study sites, small numbers of bees were found after the sugarcane harvest,"

explains Dr Maus. The count of species and individuals depended on the exact location of assessment: When the researchers performed counts in the field themselves, they found markedly fewer bees in the fields than outside them. Most of the bees buzzing around the researchers' heads were honey bees or bees of the Trigona genus. The researchers also observed other species of stingless bees, identifying a total of 13 species. "Originally we considered it possible that we might not find any bees at all and there would be no chance of them potentially getting harmed by insecticides," Dr Maus says. "However, eventually just a few bee species were found. Also the number of specimens was quite low, especially compared to other crops that attract bees, like rapeseed or sunflowers."

The results help contribute to the basic understanding of the pollinator situation in Brazil. For example, the study clearly shows regional differences, with the scientists documenting significantly fewer species in Paraná than in São Paulo. It is these regional deviations which are precisely why the field studies are so important. However, the composition of the species does not just vary geographically. "In crops other than sugarcane, we may see very different kinds of bees," explains Dr Maus.

For this investigation, Bayer is collaborating with other companies within the industry and is also conducting studies on rice and maize, for example. Its partners Syngenta and BASF are also researching crops like coffee, cotton and citrus fruits. "We share our reports and results with one another," says Dr Maus.

"The more we all know about the habits of important beneficial insects, the better we will be able to protect them."

CONCLUSION

The study shows one thing above all: Even within the same country and the same crop, the bee community can vary greatly. For this reason, Bayer, along with partners within the industry, is supporting additional studies on other crops, such as maize, citrus, and coffee.