People need bats – insect control

Few people realise how important bats are, both to other wildlife and to ourselves. Like all other mammals, milk is their first food after birth, when they are suckled by their mother. But once they are weaned the range of diets in bats is nearly as broad as that found in all mammals, and what they eat and how they eat it has a huge knock on effect on every one of us.

Bats as controllers of insects

Around 70% of all bat species eat insects, just like all British bats. While most insects are useful, in many parts of the world some are major agricultural pests of crops, but until recently the role of bats as pest-controllers has been underestimated.

Rice Is the staple food of almost half the world's population, so sustainable rice production is critical to global food security. The world rice crop is attacked by more than 800 species of insects and In regions where the majority of rice production is concentrated there is concern about the over-use of pesticides. In Spain soprano pipistrelles were proved to control rice borer moth infestations for at least two of the moth's peak activity when most damage is done. In Thailand researchers seeking effective control of the white-backed plant hopper, a pest of rice, demonstrated that bat population declines will affect food security of local people, and suggest rice farmers establish bat roosting boxes.

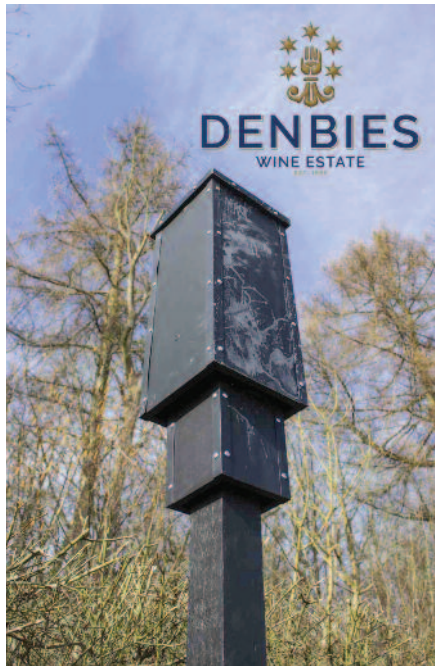
Thousands of wrinkle-lipped bats stream out of their roost in Thailand.

© David Scully

Corn (maize) is an essential crop for many farmers, grown on more than 150 million hectares worldwide. An estimated 100 million Mexican free-tailed bats roost in Bracken cave in south-central Texas, and DNA tests have confirmed they regularly consume the corn earworm moth during the early part of the growing season. They can consume four billion corn earworm moths per night, reducing the need for one or two insecticide applications each year. For some years many American farmers have been attracting bats to their land, installing artificial roosts such as bat boxes, to encourage the bats. The corn earworm is also known as the cotton bollworm, as it does enormous damage in the cotton fields if unchecked. So the free-tailed bats are also helping the cotton-growing industry.

Depending on the species, nocturnal bats can devour half to two-thirds of their body weight in insects each night. In the Alentejo, a wine-producing region southeast of Lisbon, farmers installed 20 wooden bat boxes amid its rows of grapes. These have attracted Kuhl's pipistrelles and Leisler's bats, and there has been a drop in the number of insects on the estate. The bats have become a reliable replacement to the harsh chemicals often used to ward off pests.

Growers are discovering the value of bats as pest controllers for other crops too, including Macadamia orchards in South Africa, cacao (from which cocoa is made) in south east Asia, walnut trees and pecan orchards in the southern United States. The fewer pesticides used on crops the less we take in when we eat. Bats are among the best friends to organic farmers, as attracting bats can make a significant difference to farmers who want to use natural biological insect control.



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Bat boxes erected in a vineyard in Surrey, UK.

Research on bats helps in other ways too

Studies of the anticlotting chemicals in the saliva of vampire bats have led to the development of an anticoagulant for people at high risk of blood clots and strokes.

The development of sonar for ships and ultrasound was partly inspired by the system of echolocation that bats use.

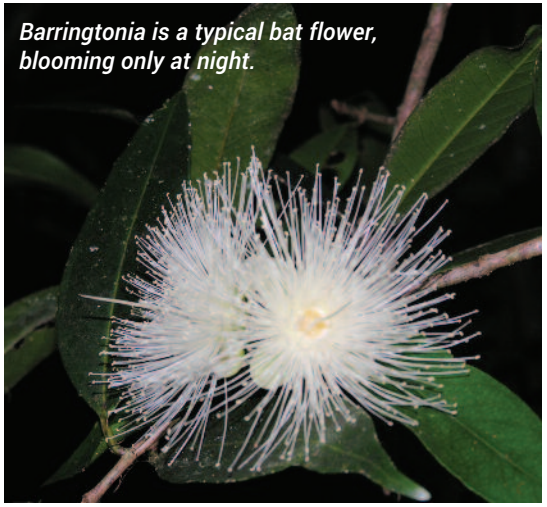
Ongoing research on the structure of bat wings and the mechanics of bat flight may ultimately lead to the development of technologies that improve the manoeuvrability of aeroplanes. Researchers are trying to discover the gene that enables some bats to live an average of four times longer than other placental mammals of a similar size, while still remaining active.

Search the web to find out more about the research mentioned here. Where else are bats helping farmers?

People need bats

Tropical forests need bats

Whilst most bats feed on insects, nearly a quarter of the world's bat species feed on plants in the tropics and sub tropics, and many of our most valuable crop plants rely on bats: avocados, balsa wood, breadfruit, cashews, carobs, cloves, dates, figs, mangos and peaches, to name just a few. More than 450 economically significant plant species are known to depend partly or completely on bats for pollination or seed dispersal.



Barringtonia is a typical bat flower, blooming only at night.

Bats as pollinators

Flowers have special ways of attracting bats. They are often pale so that they show up in the dark, they usually grow on the ends of branches so bats can feed easily, and may only open at night. Some produce much more pollen and nectar at night than in the day, and may have a very strong smell. In return for pollen and nectar, the bats do the plants a good turn by transferring pollen grains that stick to their fur to the next flower they visit on their round, so pollinating it.

Bats spread seeds

Fruit-eating bats – frugivores – are vital seed dispersers in tropical forests worldwide, eating the fruits of well over 700 plant species, enabling long-distance seed dispersal. You have probably seen figs in the supermarket, especially at Christmas. There are over 750 different sorts of wild fig, and they are one of the most important foods for rainforest animals and the favourite food of many bats. Each fig has hundreds of seeds, sometimes as many as 2,000 in a single fig, and the bat eats the whole fruit, seeds and all. As they fly, they disperse undigested seeds in their droppings. Many of these trees are important not only as food, but also for medicine and wine; timber is used for boats and houses, and fibres are twisted into twine and ropes.

The calabash tree

One of the first trees to be recognised as a tree visited by bats was the calabash, found throughout Central America and Mexico. The greenish-yellow flowers open in the evening and are visited by tiny nectar-feeding bats and by larger fruit-eating bats, as well as moths and insects, seeking nectar within each flower. Once pollinated, a large round woody fruit develops. It is not good to eat, but the case becomes very hard when dried, and is made into cups and bowls, or carved and sold to tourists.

Calabash fruit

Mangos

Mangos

Mangos are one of the world's most important tropical fruits. They are grown in many countries, and even in places where they have been introduced many bats visit the flowers for nectar and pollen, so helping to pollinate them. The fruit hangs from the tree on long stems. It has a single large flat stone inside, but some large bats carry them away from the tree to eat, so planting new trees elsewhere.

Mangroves

Mangroves live half-way between the sea and the land on sheltered tropical shores. Their strange root systems enable them to cope with tidal changes, and keep soil from being washed away by the sea, so defending the land from flooding. Millions of creatures live in the mangrove swamps – crabs, lizards, crocodiles, fish, monkeys and insects of all kinds. Bats are among the pollinators of some mangrove trees as they feed on the nectar and pollen of mangrove tree flowers.

Mangroves

Bats are vital to the regeneration of the rainforest when it has been felled or burnt. Most of the first plants to grow again on disturbed land, the 'pioneer trees', have been scattered by bats, enabling the forests to grow again.

Can you find out about other tropical trees that bats help?

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