

NAVIGATION

“Hither and thither he wandered, steering by star and by sun.”

A.B. Paterson

Kanzo Makame, “The Pearl Diver”

Ever wondered how bees find their way to that patch of clover and then unerringly wing their way back home?

How do they navigate?

They have several methods.

First and foremost, they steer by the position of the sun. They can do this even on a cloudy day because they are sensitive to ultraviolet rays which penetrate clouds. Though the sun is constantly shifting its position across the sky, they can compensate for this, and even pass this information on to other bees in the hive as they recruit them to get out there and forage. Polarity of sunlight also has an influence.

A second method is visual. They note the landmarks on their route; trees, buildings, roads. Bees' perception of colour is important in identifying flowers, sensitive to the lower frequencies but unable to see red. This use of visual navigation is very important for the beekeeper to be aware of when moving hives. He knows that he must move them a metre at a time or a few kilometres. If moved a very short distance, the returning bees can still find the hive using their previous orientation guides, but if shifted several metres with slight change in surrounding visual landmarks they will return to the old site. When moved longer distances with completely different landmarks they have to reorientate and re-programme their navigation.

A third method, less well understood, is the use of the earth's magnetic field, sensitivity to its influence made possible by the presence of minute amounts of iron compounds in the abdominal region. Just how this works is unknown, but research has revealed that cancellation of the magnetic field around the hive interferes with their orientation and communication.

Finally, the bees' acute sense of smell is also an aid to navigation as they approach home on the return journey. A pheromone emitted by the guard bees from a gland in their tails effectively acts as a homing beacon. The same pheromone is left at productive foraging sites to guide other bees.

So, bees do indeed steer by the sun, but unlike Kanzo the diver, not by the stars. They don't fly at night.