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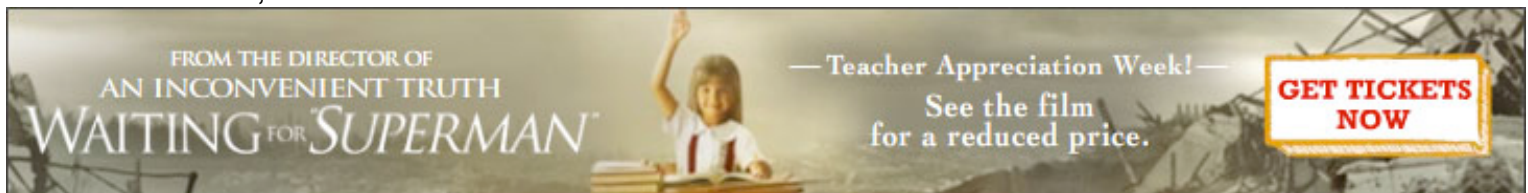
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Dr. Reese Halter

Conservation biologist, author, broadcaster

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Neonicotinoids -- Destroying the Web of Life

Recent research from the University of London shows that a bumblebee's tiny brain is able to solve complex mathematical problems giving further credence to why Mayan Shamans revered bees and their intelligence.

The fact that the bees are able to link hundreds of flowers, minimize travel distance and find their way home is incredible since their brain is the size of a pinhead. Scientists are applying this discovery to help effectively solve the "Traveling Salesman Problem." That is, finding the shortest

path that allows him to visit all the locations on his route. Essentially, the more scientists learn about bees the more we are beginning to realize their global importance and the need to protect them.

A new book entitled *The Systemic Insecticide: A Disaster in the Making* by Dutch toxicologist Dr Henk Tennekes sheds light onto a family of highly toxic chemicals -- neonicotinoids -- which are implicated in Colony Collapse Disorder and the deaths of tens of billions of honeybees around the globe.

Modern monoculture farming has begun to distance itself from spraying insecticides. Instead, it has opted to genetically modify seeds. Neonicotinoids are inserted into the seed enabling the insecticide, which is water-soluble, to move throughout its system where ultimately the toxicity is transferred to the nectar and pollen.

Bees use nectar by turning it into honey, their only source of energy. In the process of harvesting nectar from flowers, bees inadvertently cross-pollinate flowering plants. There are at least 235,000 known flowering plants for which 20,000 species of bees are the predominant pollinators. Moreover, bees require pollen as the only source of protein to make their young, build brains and strengthen their autoimmune systems.

Each year, our global biosphere endures an onslaught of some 5 billion pounds of insecticides. Many of these insecticides are neonicotinoids, which synthetically mimic a plant compound found in tomatoes, potatoes, peppers and tobacco. A neuroactive insecticide fashioned after nicotine, neonicotinoids poison nerves and prevent acetylcholine from enabling neurons to communicate with each other and with muscle tissue.

Bees exposed to neonicotinoids exhibit symptoms mimicking Parkinson's and Alzheimer's diseases. In fact, the French referred to the effect as "mad bee disease" and in 1999 were the first to ban the use of these chemicals. Germany, Italy and Slovenia have recently followed suit. The German agriculture institute concluded that the poisoning of the bees was a result of a "rub-off" of the neonicotinoid clothianidin from corn seeds.

Recently, the EPA has suspended the sale of Spirotetramat another neonicotinoid under its trade names of Movento and Ultor. There are, however, other widespread neonicotinoids available in the U.S. Currently there are no injunctions in place against neonicotinoids in Canada or Mexico.

Dr. Tennekes goes onto to explain that neonicotinoids are water soluble, mobile in soils and persistent in both soil and water. He reports that imidacloprid, another neonicotinoid, contaminated western Dutch surface waters and significantly reduced non-target, beneficial insect populations, which in turn caused a dramatic decline (because those insects are a crucial food source) for many common grassland bird species.

He details soil studies showing imidacloprid killing springtails, beetles and earthworms; robbing the soils of its necessary beneficial fauna, which in turn are important in breaking-down leaf litter, decomposing organic matter and recycling nutrients.

The Systemic Insecticides gives a detailed account of the decline of western Europe's grassland feeding birds. In addition, populations of their avian predators like Eurasian Goshawks and Northern Goshawks have likewise fallen, dramatically. The use of these potent neonicotinoids

has exhibited a deleterious effect on the biodiversity and the web of life throughout western Europe.

Although, it is very valid to note that many bird populations in western Europe began to decline 35 years ago the pervasive use of neonicotinoids is not only exacerbating declines in bird species but also it's killing the soil decomposers and contaminating fresh water.

Freshwater and healthy agricultural soils, worldwide, are of paramount importance as the human population is dramatically rising and global warming is beginning to significantly impinge upon our fresh water sources.

As an environmental safe alternative, neem-based products, made from an East Indian tree (*Azadirachta indica*), will offer excellent protection against most insect infestations. Neem-based products are widely available in the U.S., Canada and western Europe.

I strongly support Dr. Tennekes thesis of a global ban on neonicotinoids since bees are collapsing worldwide, moths and bird species in western Europe are declining, and these systemic insecticides are polluting waterways and killing essential soil fauna.

From the 1962 classic, *Silent Spring*, Prof Rachel Carson's warning seems highly appropriate: "It is not my contention that chemical insecticides must never be used. I do contend that we have put poisonous and biologically potent chemicals indiscriminately into the hands of persons largely or wholly ignorant of their potentials for harm."

Dr. Reese Halter is a Science Communicator: Voice for Ecology, conservation biologist at California Lutheran University, public speaker and author of The Incomparable Honeybee. He can be contacted through www.DrReese.com.

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