

SPECIAL REPORT: Top farm poison is a ‘threat to web of life’

News

SPECIAL REPORT: Top farm poison is a ‘threat to web of life’**It even poisons honey bees - but SA is still freely using it, while France and the European Union have started imposing bans**

07 December 2018

Reading Time: 6 Minutes

Article Number: 3 / 26

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NATURE FEELS THE STING At a global level, at least 75% of crops traded on the global market are wholly or partly dependent on the pollination services of birds, bees, butterflies and other species.

Image: Sjirk Geerts

It has been more than 50 years since American biologist Rachel Carson alerted the world to the hazards of soaking vast swathes of the global landscape with toxic pesticides.

Her book, *Silent Spring*, published in 1962, spoke of a poisoned world where the sound of birds would no longer herald the start of the morning – and a world where human health would ultimately suffer.

Carson’s book sparked worldwide awareness about the dangers of indiscriminate chemical spraying, triggered a subsequent ban on pesticides like DDT and also played a pivotal role in tighter global regulation of environmental pollution.

Now, 56 years down the line, a new generation of scientists are ringing the alarm bell over what many believe to be mounting evidence of a major emerging threat to the global web of life through the use of neonicotinoids and other “systemic” pesticides.

“Humanity never seems to learn from its mistakes,” Dutch biologist Dr Maarten Biljeveld van Lexmond said at a recent gathering of African scientists in Pretoria.

“Every two to three generations the same evils seem to come back in a different form,” Van Lexmond said.

The event was hosted jointly by the Academy of Science of South Africa (ASSAf) and the German National Academy of Sciences Leopoldina, to discuss the impact of neonicotinoids on agriculture and ecosystem services throughout Africa.

Though neonicotinoids (or neonics) only arrived on the scene in the early 1990s, they are now among the most widely used pesticides in the world.

As nerve toxins, they are often referred to as “systemic” because the poison is absorbed by plants and spread to all tissues, rendering the entire plant toxic to insect life – including honey bees and other beneficial insects.

In very simple terms, Van Lexmond and fellow members of the International Task Force on Systemic Pesticides fear that this has major implications for plant pollination and the entire biological food web, including humanity.

Humanity never seems to learn from its mistakes.

Dr Maarten Bijleveld van Lexmond



NO LESSONS LEARNT Dr Maarten Bijleveld van Lexmond, chair of the International Task Force on Systemic Pesticides, says he is surprised humanity never seems to learn from mistakes, often reintroducing the 'same evils' in different forms every few generations.

Image: Tony Carnie

This is largely because an estimated 75% of the crops traded on the global market depend to some degree on the pollination services of insects, beetles, birds and other mammal pollinators.

While pollination is one of the most crucial services, several insects and birds also provide free pest control services by eating pests that damage crops.

These emerging concerns – largely galvanised by the international Task Force on Systemic Pesticides – led to a total ban being imposed in France earlier this year. The European Union has also voted to impose an almost total ban on three of the most widely used neonics in Europe – clothianidin, imidacloprid and thiamethoxam.



WORRIED Dr Jean-Marc Bonmatin

Image: Tony Carnie.

Dr Jean-Marc Bonmatin, a senior researcher at the French National Centre for Scientific Research, says neonics and other nerve poisons such as fipronil have been widely promoted on the basis that they are less toxic to the environment than other pesticides such as organophosphates and carbamates.

However, Bonmatin told the Pretoria meeting of studies that showed several of these poisons were highly toxic to honey bees and other nontarget pollinators.

One of the reasons neonics were so successful, he said, was that rather than being sprayed over plants, crop seeds were now soaked in chemical dressings before being planted. This meant that up to 10 times less chemicals were needed for seed dressing, compared to aerial spraying.

However, Bonmatin said, imidacloprid and several other neonics were found to be 5,000 to 10,000 times more toxic to honeybees than DDT.

Other studies showed neonics could persist in the environment for more than a year, and in some cases for more than 30 years.

Professor Michael Norton, environmental programme director of the European Academies Science Advisory Council, said seed dressing was seen as a less wasteful method of distributing chemicals on farm crops. But he cited studies showing that only 5% of neonics were retained by the plant, with nearly 95% leaching into the surrounding soil, water and air.

“What we see in modern agriculture is that chemicals have now become the first resort, instead of the last resort against insect pests ... and the manufacturers still don’t accept that there is a fundamental problem with neonics,” said Norton.



UNDER THREAT Most crops traded on the global market are wholly or partly dependent on the pollination services of birds, bees, butterflies and other species.

Image: Sjirk Geerts

Bonmatin said that once the synthetic toxins entered the soil, water and the broader food web they begin to affect almost all forms of life – from mammals to fish, birds, crabs, earthworms and tiny microbes which contribute to the decomposition and breakdown of soil.

“For example, if you have less insects you will also have less birds – and in Europe we have already lost 40% of our farmland birds,” he said

Some studies have also shown that apart from killing insects, these chemicals are also capable of killing birds as large as partridges. One laboratory study demonstrated that a partridge had a 50% chance of dying just by eating six seeds treated with imidacloprid. A sparrow would only need to eat one-and-a-half such seeds to risk death, while less than a quarter of a seed would produce sublethal effects.

In another experiment, wheat seeds were treated with the same chemical and fed to partridges for International days, killing 58% of them.

Bonmatin said while there had been relatively few studies on mammals, researchers at George Washington University in the United States last year reported potentially negative neonicotinoid effects on human health that included finger tremors, autism and heart and brain disorders, as well as learning and memory problems.

The researchers said that given the widespread use of neonics, more studies were needed to fully understand their effects on human health.

A second study published in 2017 by Gennaro di Prisco and fellow Italian researchers found that clothianidin was associated with negative impacts on immune-related genes in mammals, commenting that: “It does not require a leap of imagination to speculate that neonicotinoids may have possible negative effects on human health, by similarly interfering with the regulation of the immune system.”

Croplife SA believes that most of the actions against (neonics) are the result of antipesticide lobbying that is based on highly questionable and untested hypothesis and research.

Now, with pressure mounting globally to ban, phase out or restrict the use of neonics and other systemic pesticides, it remains to be seen how SA will respond. African scientists who met in Pretoria in November agreed to appoint a small expert group to consider the impacts of neonics on pollinators and ecosystems in Africa, and to conduct further research.

Croplife SA, an industry body representing the majority of pesticide manufacturers and suppliers, has declined to disclose the current volumes of neonicotinoids used in SA.

However, in response to questions. Croplife SA said: “We remain committed to responsible and ethical production, sales and use of all agricultural remedies.”

When products came under pressure such as the case with neonics, Croplife was prepared to take a critical look at the issues and address them appropriately if necessary, “but the industry cannot take action on unfounded allegations”.

“Croplife SA believes that [neonics] when applied according to label instructions, including recommended safety measures, cannot be labelled generally as threatening to bees.

“Croplife SA believes that most of the actions against [neonics] are the result of antipesticide lobbying that is based on highly questionable and untested hypothesis and research,” according to spokesperson Dr Gerhard Verdoorn.

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