HONEY, LET'S **NOT SHRINK** THE BEE POPULATION

Story by Clara Applegarth Photos by Sandy Scarpa

Honey bees come and go from their hive at Gar for the Environment in the Inner Sunset in San Francisco, Calif. O (Sandy Scarpa / Xpress Magazine)

he honey bee is the glue that together through pollination. An insect so small, but so gargantuan in its purpose.

Dut honey bees are ate her successor. being threatened as "She'll lay 10, the climate grows more extreme and human interaction, in the form of deadly pesticides, harms them. In July, President Trump put sulfoxaflor, a pesticide that acts as a deadly infiltration to bee colonies and which was banned in 2016 under the Obama Administration, back on the market. The bee decline is happening before our very eyes, and perhaps even in our own backyards.

THE HEART OF THE NATION

oney bees are intel-ligent creatures and have several ways in which they maintain the hive, as well as the queen. It's important to know a few basics about a hive in order to understand the effects of these pesticides on honey bees.

"They're way smarter than we are," said Marc Johnson, board member of the San Francisco Beekeepers Association (SFBA). "There's a hive intelligence. The queen is dependent upon the hive and the hive is dependent on the queen. I explain it as a superorganism, like our bodies, we have a heart that supports the rest of our body, and the rest of the body supports the heart and the queen, in that sense, I call [it] the 'heart of the nation.'"

The queen lays eggs and while the hive works around the clock to

keep a good equilibrium that includes keeping a holds ecosystems temperature of 93 degrees Fahrenheit at all times. When the queen runs out of eggs and sperm, the hive will prompt her to cre-

> "She'll lay 10, 12 eggs that develop into queens. Those nine to 12 come, fight it out, like "Game of Thrones," and that's how the strongest survives. She goes out to mate, and when she mates she returns to the hive."

"THEY'RE WAY SMARTER THAN WE ARE. THERE'S A HIVE INTELLIGENCE. THE QUEEN IS DEPENDENT UPON THE HIVE AND THE HIVE IS DEPEN-DENT ON THE QUEEN. - MARC OHNSON

ueens mate with male bees, known as "drones," that usually reside by the surrounding area of a hive and are much larger in size. Their main function is to attempt to successfully mate and impregnate the queen bee, according to Perfect Bee, a website dedicated to all things bee.

"[The queen] lays two types of eggs," Johnson said. "She lays a fertilized egg and an unfertilized egg. The unfertilized egg is a male bee, they're larger. They have one job in life and that is to mate with the next queen. The fertilized egg is a female worker bee.'

A queen bee will lay roughly 2,000 eggs, both unfertilized and fertilized, per day, if the hive is healthy, the drones are healthy and the queen is healthy, according to the Orkin website. Each bee has a life span of six to eight weeks, Johsnon said. But the gueen bee's life span can range up to two to three years.

This is where the hive intelligence, if met with systemic pesticides, becomes compromised.

WHAT IS SULFOXAFLOR?

reg Loarie is an attorney at Earthjustice, a law firm that represents environmental conservation efforts throughout the nation. Loarie works directly with beekeepers, as well as nonprofits who protect bees and other pollinators. He is well versed in pesticides, specifically sulfoxaflor.

Sulfoxaflor is "dif-ferent than most pesticides in that it is systemic," Loarie said. "You spray them on the crop and the insect either comes into contact with the spray directly, or comes into contact with the residue of the spray on the foliage and dies more or less immediately on contact."

Sulfoxaflor is what is known as a "neonicotinoid." According to a fact sheet on Texas A&M AgriLife Extension's acts on an insect brain the same way nicotine does in the human brain. It stimulates receptors that cause responses in the nervous system, and if it doesn't kill a honey bee, it can be

honey bees by contact of one colony member. There are a variety of ways it can be treated on a crop.

dripped into the soil. It means that they can be sprayed on the foliage," Loarie said. "They can even

after it eats a certain amount THE RISE AND FALL of the treated plant crop."

The problem with systemic pesticides is that "Sulfoxaflor can be when farmers spray it on their crops, it gets into the roots, which enters the soil. It can then enter the water supply and any other plac-



Marc Johnson, Board Member of SF Beekeepers Association and education outreach, holds a frame of honey bees from the hive in San Francisco, Calif. On Feb. 27, 2020. (Sandy Scarpa / Xpress Magazine)

herefore, if sulfoxa-

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flor is sprayed any-

website, a neonicotinoid be used as seed treatments es near the sprayed crop. for you to see in a bath of the pesticide and then planted and as the plant grows. The actual sprout is toxic to insects. That means that the insect doesn't necessarily die sort of immedispread and threaten other ately after contact. It dies

OF SULFOXAFLOR

Sulfoxaflor first came to be in 2013, when it was registered by the Environmental Protection Agency and listed under names such as "Transform" and "Closer." It was an

attempt to find a highly effective insecticide against those insects that began to show a tolerance for other neonics. It showed high success rates with less application, according to an article published by the EPA.

"I was the attorney that represented the beekeeping organizations challenging the EPA's decision to register sulfoxaflor for the first time back in the Obama administration." Loarie said. "That litigation resulted in sulfoxaflor being initially taken off the market, and then substantial restrictions on use put in place."

oarie represents non-profits that oarie represents often sue the EPA, such as the Pollinator Stewardship Council, Inc. (PSC), who won the case that first took sulfoxaflor off of the market in 2016. "We, in the beekeep-

ng world, we saw that and said, 'Wonderful, another toxic systemic pesticide has been reqistered for use on bee-effective crops," Executive Director of LEAD for Pollinators Michele Colopy said. Olopy's duties are to bring small farmers and non-profits like the Sierra

pollinated by honey bees, Club together and educate, there's a good chance that as well as collaborate on advocacy.

"When we reviewed the

registration we said, 'we're not happy with this because cleaners, the furniture polish, different shampoos — mix the EPA clearly stated, our best professional hunch is, 'this should be okay." We took them to court on that, because professional hunches are not science," Colopy said. "The ministration can do what they want. That is why there are have to sue to stop things."

Tow Colopy and other nonprofits are returning to court to fight the same battle they had won merely three years earlier.

"Right now the EPA is paralyzed," said bee researcher Randy Oliver, who conducts his studies in Grass Valley, California. "It would take getting rid of Trump — the

Oliver is a noted high school biology teacher turned bee researcher, who conducts his own studies on his property. Oliver believes that while different pesticides do harm beneficial insects, bees are healthier than ever.

Oliver sees honey bees as livestock, with power in numbers. "Think of under your own kitchen sink," Colopy said,

"During wintertime, the bees just cycle down. That is a normal part of the behavior. We have two things that have happened in the past couple of years that affect our bees. One is there are 25,000 more cars on the road at this point in time [than] there were five years ago because Uber and Lyft," Johnson said. "The air is different. That affects, again,



"This is the other issue we get into this industrialized agriculture," Colopy said. "Like almonds, you have 1,300 square miles or more of one crop. It's bad farming. It's bad land management. It's not supporting a balanced ecosystem. It's only supporting greed."

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it all together, that's what they're spraying on your food as it's growing."

pees pollinate are necessary for thriving colonies, and as little intervention with chemical agents as possible.

DOUBLE DOSE: PESTICIDES AND CLIMATE CHANGE

 \mathbb{A} s if having chemicals that directly harm honey bees $T_{\rm A}$ wasn't enough, the world is also battling the climate crisis, which threatens all species.

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both sense of smell and sense of sight. So [a honey bee] may not see flowers or smell flowers the same exact way. And we seem to have a honey drop off at that point in time."

t's not just the sight Land smell of honey bees that are negatively impacted by climate change, though.

"We should be concerned. We know that the insect biomass globally is just being decimated. It's an accumulation of things. It is the overuse of pesticides — especially those pesticides that have these long half-life," Colopy said. "One application of a "WE AS HUMANS — TO FIX THIS — HAVE TO GET OFF THE DRUGS, WHICH ARE PESTICIDES. IT REALLY ALL COMES DOWN TO MONEY. IT COMES DOWN TO CONSUMERS UNDERSTANDING THAT IF YOU BUY A PESTICIDE, AND YOU MAKE YOUR NEIGHBOR SICK OR YOU MAKE YOURSELF

SICK, [IT'S] YOUR OWN DARN FAULT," - MICHELE COLOPY

pesticide might last in the soil for up to three years if it gets into the water and stays down in the sediment where the sun can't help to break it up."

The problems con-L tinue to mount when harmful remnants get into waterways. "Then you have a flooding issue. That sediment that's

toxic is going downstream killing other invertebrates in the water. So it is causing problems for even the insects that we are killing, and we are killing an awful lot of beneficial ones," Colopy said. "Those beneficial [insects] were to be there to feed birds, to feed the fish, to feed the frogs [and] to feed other critters. When we destroy the bottom of the food chain, everything else moves down."



Fresh honeycomb sparkles in the sun at Garden for the Environment in the Inner Sunset in San Francisco, Calif. On Feb. 27, 2020. (Sandy Scarpa / Xpress Magazine)





WHAT CAN WE DO?

ohnson paused over his large latte that I had a swirled design in it and hung his head low to try and find his words.

"I don't think we're taking enough care of our farming communities and their use of pesticides. So many of these [pesticides] are supposed to not be harmful to honey bees, but we know that they are," Johnson said. "If the bees go away, we're in deep doo-doo. Thirty percent of our food is pollinated directly by the honey bees."

Olopy said hope is not entirely lost, even though chemical companies compromise government, which compromises policy, which in turn, compromises the environment.

Colopy and her team said the four biggest things we can do is to eat organic foods, eat a diet specific to our geographical location, purchase local and support local beekeepers.

"We as humans — to fix this — have to get off the drugs, which are pesticides. It really all comes down to money. It comes down to consumers understanding that if you buy a pesticide, and you make your neighbor sick or you make yourself sick, [it's] your own darn fault," Colopy said. "The pesticide company doesn't care. While we have regulations, those regulations are not really saying buyer beware. People think that well, 'if [the] EPA registers it, it must be safe.' It is a product meant to kill, therefore, it is not safe." X





