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NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

By John Ferguson

Last week we were talking about fungi and their importance to soil and plant health. A reader (Joan M.) wrote in with a recommendation on a documentary on Netflix called “Fantastic Fungi”. My wife and I watched it this past week and the photography is spectacular. My wife is not a gardener and she loved it. Thanks for the recommendation.

Speaking of fungi, I read a paper last week on a common fungus called *Candida albicans*, a type of yeast. This fungus is all around us, in the soils, in the air we breathe, and lives in our digestive tract. The paper found it exists in two forms, one that is harmless and one that can kill you.

The researchers found that there are chemicals in the mucus that the body produces called glycans (a complex sugar molecule) that prevent the fungus from turning into a bad guy (changing it from a round yeast form to a toxic form growing hyphae).

The researchers at MIT also found that our mucus works on other pathogens like *Pseudomonas aeruginosa* and *Staphylococcus aureus*. *Nature Chemical Biology* 2022.

This work illustrates the importance of eating nutrient dense food, free of toxic chemicals. The best way to do this is to grow as much as possible our own vegetables, fruits and herbs in organic mineral rich soil, so our immune system has the tools it needs to protect us.

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By now we are all aware of the plight of our honeybees called CCD (Colony Collapse Disorder) that has been linked to pesticides especially neonicotinoids.

Our native bees are also responsible for a lot of the pollination of our fruits and vegetables. The American Bumblebee has experienced an 89% decline over the last 20 years and some species over 91% decline and are now listed on the endangered species list.

Researchers at the University of Konstanz in Germany have discovered one of the reasons. They found that even very low exposure to the herbicide glyphosate (found in Round-Up) was the cause. Even though the exposure was sub-lethal as it did not kill them, it caused the bees to lose their ability to regulate temperature in their colonies which prevented larva from developing into adult bees.

I have known about insect decline from Monarchs to Honeybees, but I was unaware how bad it was on a world-wide basis for all insects until I read a book called:

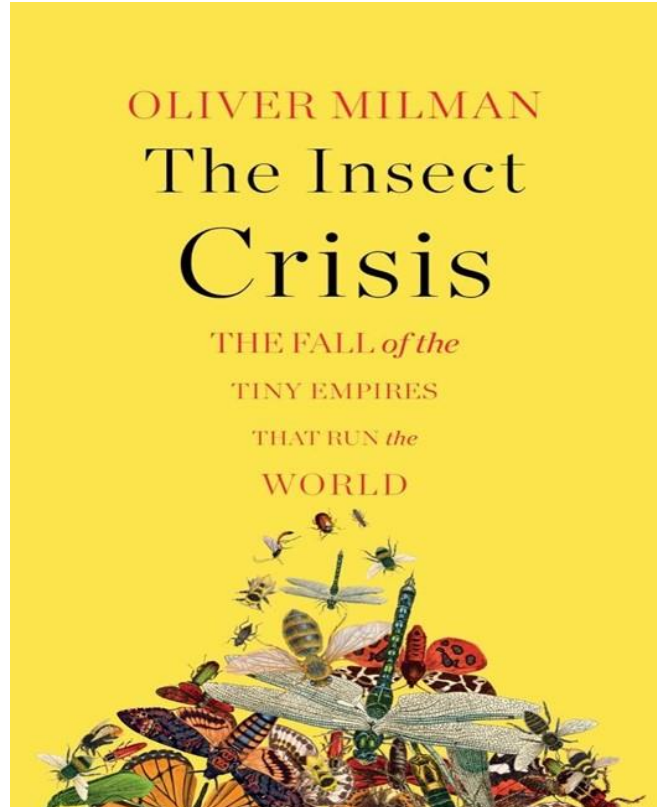
“The Insect Crisis – THE FALL of the TINY EMPIRES That RUN the WORLD”, by Oliver Milman, 2022, W.W Norton and Company, ISBN: 978-1324006596.

From the cover:

“A devastating examination of how collapsing insect populations worldwide threaten everything from wild birds to the food on our plate.

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From ants scurrying under leaf litter to bees able to fly higher than Mount Kilimanjaro, insects are everywhere. Three out of every four of our planet's known animal species are insects. In *The Insect Crisis*, acclaimed journalist Oliver Milman dives into the torrent of recent evidence that suggests this kaleidoscopic group of creatures is suffering the greatest existential crisis in its remarkable 400-million-year history. What is causing the collapse of the insect world? Why does this alarming decline pose such a threat to us? And what can be done to stem the loss of the miniature empires that hold aloft life as we know it?



With urgency and great clarity, Milman explores this hidden emergency, arguing that its consequences could even rival climate change. He joins the scientists tracking the decline of insect populations across the globe, including the soaring mountains of Mexico that host an epic, yet dwindling, migration of monarch butterflies; the verdant countryside of England that has been emptied of insect life; the gargantuan fields of U.S. agriculture that have proved a killing ground for bees; and an offbeat experiment in Denmark that shows there aren't that many bugs splattering into your car windshield these days. These losses not only further tear at the tapestry of life on our degraded planet; they imperil everything we hold dear, from the food on our supermarket shelves to the medicines in our cabinets to the riot of nature that thrills and enlivens us. Even insects we may

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dread, including the hated cockroach, or the stinging wasp, play crucial ecological roles, and their decline would profoundly shape our own story.

By connecting butterfly and bee, moth and beetle from across the globe, the full scope of loss renders a portrait of a crisis that threatens to upend the workings of our collective history. Part warning, part celebration of the incredible variety of insects, *The Insect Crisis* is a wake-up call for us all.”

Comment: If this decline of insects and environmental destruction continues, it will make the famines and plagues described in the Bible a reality.

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