Gage W. DeVries

Mr. Forward

Senior Composition

5-1-18

Dow Shalt Not Kill

Paradox: a seemingly absurd or self-contradictory statement or proposition that when investigated or explained may prove to be well founded or true. An example: The Environmental Protection Agency (EPA) has set a chemical residue tolerance for chlorpyrifos on food, even though a 2016 EPA report concluded that there was "no safe level of exposure" (Rabin). In other words, the EPA allows the use of this synthetic poison, but warns ingesting food containing chlorpyrifos is a health concern; which is absolutely absurd. Chlorpyrifos are dangerous neurotoxins; therefore, they should be banned nationwide.

In 1965, Dow Chemical Company introduced their newest creation: a chemical called chlorpyrifos, which they later named Dursban and Lorsban. Designed to target the nervous and reproductive systems of insects, chlorpyrifos became the most widely-used conventional pesticide in the United States (US), according to the Environmental Protection Agency. Sprayed on everything from apples, corn, strawberries, and peaches to name a few. In the following decades, studies revealed that chlorpyrifos were actually very dangerous, and environmental/human rights activists called for a nationwide ban. In 2001, chlorpyrifos were banned for home use, and in 2007 a petition was created for an outright ban. However, the petition was denied in 2017 when Donald Trump appointed Scott Pruitt as head of the EPA.

Chlorpyrifos adversely affect child development in the womb and throughout their early years. Researchers from Columbia University studied the effects of chlorpyrifos on fetuses and

babies, and found three-year-olds exposed to chlorpyrifos in the womb scored several points lower on motor function tests. Researchers also noted children were more likely to develop: attention and cognitive disorders, lower IQ's, and a lower working memory (Schipani). These pesticides cause an array of problems. Another study was conducted by the University of North Carolina, and they studied the effects of this poison on children as well. Their findings concluded that children exposed to chlorpyrifos after birth had abnormal reflexes and poor lung functions. The nervous systems were also structurally changed; researchers warn chlorpyrifos are a significant health concern to developing children (Rabin). Both of these studies concluded that there is a link between chlorpyrifos exposure and nervous system damage.

Chlorpyrifos are too much of a health threat for farmers to continue using. This poison was specifically designed for harming the nervous system, and it does it all too well, even in humans. The United States Centers for Disease Control classifies chlorpyrifos as a neurotoxin of the same family as sarin gas (a toxin used in warfare). Designed to overstimulate the nervous system to kill target insect species, they also work to disrupt the endocrine system, leading to detrimental effects on the reproductive, neurological, and immune systems (Morris). This insecticide poses too dangerous a risk for farmers. Chlorpyrifos target nerve pathways in order to block neurons from transmitting messages. They were designed to block an enzyme called cholinesterase. This enzyme protects nerves, and when overstimulated causes a wide variety of effects: nausea, vomiting, dizziness, headaches, and death (Scutti). This neurotoxin affects humans exactly the same way as target insect species; there simply is no "safe" way to use it.

This poison poses a greater risk to non-target species and the environment than it does to its intended targets. US government scientists found that the insecticide is washing into rivers and streams after being applied to various crops, causing harm to 38 different species of

endangered fish, particularly an endangered species of salmon. The poison is contaminating the salmon and in turn, the orcas that feed upon them. The pesticide then causes harm to the orcas and has scientists worried that the entire food chain could collapse (Charles). Instead of killing its actual targets, this neurotoxin is threatening an entire food chain already labeled by scientists as “critical”. Non-target species are more often the actual targets of this neurotoxin, than the intended targets. The National Institute of Health has found that chlorpyrifos are very dangerous to other animal species. It is “extremely” toxic to birds, fish, and bees. Birds and aquatic organisms are at a higher risk than intended insect species (“TOXNET”). Chlorpyrifos are better at killing everything but their target insects; it is asinine to continue to use this deadly poison.

Supporters of chlorpyrifos, namely Dow Agrosciences, claim that the evidence is inconclusive, and that this pesticide is vital for crop protection. Dow claims that there is no correlation between neurological harm and their poison, and they stress the need for chlorpyrifos, saying it is essential for protecting crops not just in the US but also across the entire planet (Rabin). Spokespeople for Dow repeat that safety is at the forefront of their minds, and chlorpyrifos is safe at EPA recommended levels.

Dow’s statement is simply false; there are safer and better alternatives to pesticide use. Stephen L. Tvedten has worked in the pest control business for over 40 years, and has designed and patented a unique enzymatic process. While today’s insects are becoming resistant to insecticides, they cannot become immune to enzyme “pestisafes” because insects use these enzymes to molt. They are very effective seeing how it only takes around 6 seconds to kill most insects. The active enzyme, protease, can only react with its proper protein; meaning humans, animals, and the environment are all safe (Tvedten). This product is an all-natural and safe

method to controlling pests. As for the crops Dow is so worried about protecting, chlorpyrifos actually harm those as well by inhibiting another enzyme. Tvedten explains this phenomenon:

> Researchers also found that thifensulfuron [an herbicide] in soybean leaves was detoxified by an esterase, an enzyme related chemically to acetylcholinesterase, the enzyme inhibited by chlorpyrifos [in humans]. Chlorpyrifos also inhibited the esterase responsible for detoxifying thifensulfuron in soybeans, resulting in crop damage. (Tvedten)

Similarly, with cholinesterase in humans/animals, chlorpyrifos inhibit an enzyme in plants; causing them to be at risk of being harmed.

Chlorpyrifos need to be banned by the EPA. The EPA was set to ban these neurotoxins until Scott Pruitt, Donald Trump's EPA pick, denied the petition; while, Barack Obama's EPA favored caution and was in the process of banning this poison. Even the EPA's own scientists were baffled when Pruitt decided to deny the petition, calling it a "mistake" (Schipani). The EPA has all the evidence they need for a total ban and were going to do just that. State legislators are calling for a ban and are even passing new legislation to do it themselves. For example, Hawaii is in the midst of passing a bill that would ban all pesticides containing chlorpyrifos; the law will go into effect next year (Tribune-Herald). Their house voted "unanimously" on this bill, and their constituents adamantly oppose of these "known neurotoxins" in their state.

Chlorpyrifos are synthetic poisons that cannot be used safely. They harm every living organism they come into contact with; plant or animal. The EPA has all the evidence they need for an outright ban. There are much safer and more effective alternatives to these pesticides. Neurotoxins such as these have no place around homes, schools, food, and the environment.

Works Cited

Charles, Dan. "Government Scientists Say A Controversial Pesticide Is Killing Endangered Salmon | Ocean Leadership." *Consortium for Ocean Leadership,* 17 Jan. 2018, oceanleadership.org/government-scientists-say-controversial-pesticide-killing-endangered-salmon/.

Morris, Meagan. "Senators Seek to Ban Brain-Damaging Pesticide the EPA Wants to Keep Legal." *Metro US*, 26 July 2017, www.metro.us/body-and-mind/health/chlorpyrifos-neurotoxin-senators-banned-insecticides.

Rabin, Roni Caryn. "A Strong Case Against a Pesticide Does Not Faze E.P.A. Under Trump." *The New York Times*, The New York Times, 15 May 2017, www.nytimes.com/2017/05/15/health/pesticides-epa-chlorpyrifos-scott-pruitt.html.

Schipani, Vanessa. "The Facts on Chlorpyrifos." *FactCheck.org*, 5 May 2017, www.factcheck.org/2017/04/the-facts-on-chlorpyrifos/.

Scutti, Susan. "EPA Won't Ban Pesticide Chlorpyrifos; Is It Safe?" *CNN*, Cable News Network, 30 Mar. 2017, www.cnn.com/2017/03/30/health/epa-chlorpyrifos-decision/index.html.

"TOXNET." *U.S. National Library of Medicine*, National Institutes of Health, toxnet.nlm.nih.gov/cgi-bin/sis/search2/r?dbs+hsdb%3A%40term+%40DOCNO+389.

Tribune-Herald, MICHAEL BRESTOVANSKY Hawaii. "Bill Eyes Regulations on Users of Restricted-Use Pesticides." *Hawaii Tribune-Herald*, 11 Apr. 2018, www.hawaiitribune-herald.com/2018/04/11/hawaii-news/bill-eyes-regulations-on-users-of-restricted-use-pesticides/.

Tvedten, Stephen L. "Best Pest Control 2." *Stephentvedten.com*, www.bing.com/cr?IG=2047CE3668BC4EBDAF3D8F902789D3E4&CID=14BBD1152F

8F679D3B02DAC92E20666A&rd=1&h=2qtFLNbBPm85ZkjZ0CI5rVX5D2Xrx847Dxe59wM7F3o&v=1&r=http%3a%2f%2fwww.stephentvedten.com%2f38_Nontoxic_Alternatives.pdf&p=DevEx.LB.1,5511.1.