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NON-TOXIC SAN DIEGO

PESTICIDES ISSUE

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10 Diseases Linked to Pesticides Exposure

Flora Yuan

Researchers have been finding more and more evidence on the harmful effects of pesticides on our environment, our animals, and ourselves. Scientists have been connecting many of the common diseases we know today with the widespread pesticide exposure in our daily lives. What diseases do pesticides put

you at risk for?

Alzheimer's Disease

01 Alzheimer's Disease is the most common case of dementia. It is a progressive disorder that causes the degeneration of brain cells, leading to the slow destruction of memory and thinking skills. A study from Utah involved more than 4,000 residents aged 65 and older from an agricultural county in Utah; around 750 participants reported working with pesticides in their lifetime. While the exact implications are unknown, many researchers are now linking pesticides as an increased risk factor to Alzheimer's Disease.

Asthma

02 Asthma is a respiratory condition in which airways narrow and swell, making breathing difficult and triggering coughing. Studies show that pesticides not only trigger asthma attacks but are also a root cause of asthma. A California study showed that children exposed to herbicides during their first year of life are 4½ times more likely to be diagnosed with asthma. Additionally, toddlers exposed to insecticides are over 2 times more likely to get asthma.

Cancer (Breast, Prostate, Ovarian, Skin)

03 Cancer is a broad umbrella for diseases involving abnormal cell growth and division that destroy body tissue. Studies show that pesticide exposure during pregnancy and throughout childhood increases the risk of cancer among children. Additionally, girls who were exposed to DDT before they reach puberty are 5 times more likely to develop breast cancer in middle age, according to the President's Cancer Panel. Farmers and pesticide applicators have higher rates of prostate, ovarian, and skin cancer.

Leukemia

04 Leukemia is a type of cancer that affects the blood and bone marrow. One study in California found that household pesticide use can nearly quadruple the risk of childhood leukemia. The children exposed to indoor insecticides were at a higher risk of these childhood cancers.

Lymphoma

05 Lymphoma is a cancer of the lymphatic system, the body's germ-fighting network, affecting the lymph nodes, spleen, thymus gland, and bone marrow. The Lymphoma Foundation of America has shown that exposure to popular pesticides, especially glyphosate herbicide leads to a 41% increased risk of developing non-Hodgkin's lymphoma.

Soft Tissue Sarcoma

06 Soft Tissue Sarcoma is a type of cancer that affects the muscle, fat, fibrous tissue, blood vessels, and other supporting tissue of the body. A 1995 control study of Denver children found that yard pesticides were linked to an increase in the risk of soft tissue sarcoma. Other studies have shown an increased risk for soft tissue sarcoma in residents living near traditional agricultural areas.





Continued



Lymphoma

07

Attention deficit hyperactivity disorder (ADHD) is a mental health disorder that includes attention difficulty, hyperactivity, and impulsiveness. A study consisting of more than 1,100 children by Maryse F. Bouchard showed that children with higher levels of pesticides in their urine were more than twice as likely to have ADHD. Additionally, a study by the Environmental and Occupational Health Sciences Institute (EOHSI) showed that exposure to pyrethroid pesticides (commercial and household insecticides) is an additional risk factor to ADHD.

Autism Spectrum Disorder (ASD)

08

Soft Tissue Sarcoma is a type of cancer that affects the muscle, fat, fibrous tissue, blood vessels, and other supporting tissue of the body. A 1995 control study of Denver children found that yard pesticides were linked to an increase in the risk of soft tissue sarcoma. Other studies have shown an increased risk for soft tissue sarcoma in residents living near traditional agricultural areas.

Diabetes

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Diabetes is a group of diseases that result in high blood glucose. The two most common types are Type 1 diabetes (pancreas produces little to no insulin) and Type 2 diabetes (glucose processing is impaired). A review of 21 previous studies showed that exposure to any type of pesticide resulted in a 64% increased risk of Type 2 diabetes and a 61% overall increased risk of any type of diabetes.

Parkinson's Disease

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Parkinson's Disease is a disorder of the central nervous system that leads to shaking, stiffness, and difficulty walking. Scott Ryan, a professor at the University of Guelph, found that low-level exposure to agrochemicals (a chemical used in agriculture) disrupts cells, mimicking the mutation effects of Parkinson's Disease. Other studies have found sufficient evidence for an association between exposure to pesticides and Parkinson's Disease after long durations of exposure.

History and Development of Pesticides

TRAVIS WANG

The development of agriculture 10,000 years ago shifted humanity away from the nomadic style of life that defined Homo sapiens and distant ancestors for nearly 2 million years. Farming has its roots in the Fertile Crescent of Mesopotamia; seeds and plants were cultivated, thanks to the abundant arable land. Wheat, barley, and peas became staples for the Mesopotamians while rice was domesticated in Asia and Africa. As the populations of these civilizations grew dependent on crops, famine was an ever present threat. Pests and diseases regularly threatened yields and the stability of these cultures. Only several millennia later does the first recorded case of pesticide use appear.

Sulfur compounds were utilized by the Sumerians against insects and mites 4,500 years ago, followed by Chinese arsenic and mercury for body lice 1,300 years later. The Greeks and Romans included chemical methods alongside folk magic and prayer to control diseases, weeds, and pests. The lack of a chemical industry limited pesticides to being organic or easily derived. Smoke was believed to dispel mildew and plant extracts, insects. Weeds were normally hand-picked, but salt and sea water were reportedly used as well. The Victorian Era saw the first manufactured pesticides, as well as purifications of previous ones. Nicotine compounds, pyrethrums, rotenone, and cyanides were all found to be inside various plants and made more effective by purification and blending. Chemically synthesized compounds such as "Paris Green" and "Bordeaux Mix" were discovered during this time too and joined the botanical pesticides in regular commercial and home use. With the establishment of science and reasoning, it would only be a century before the next significant breakthrough in pesticides.

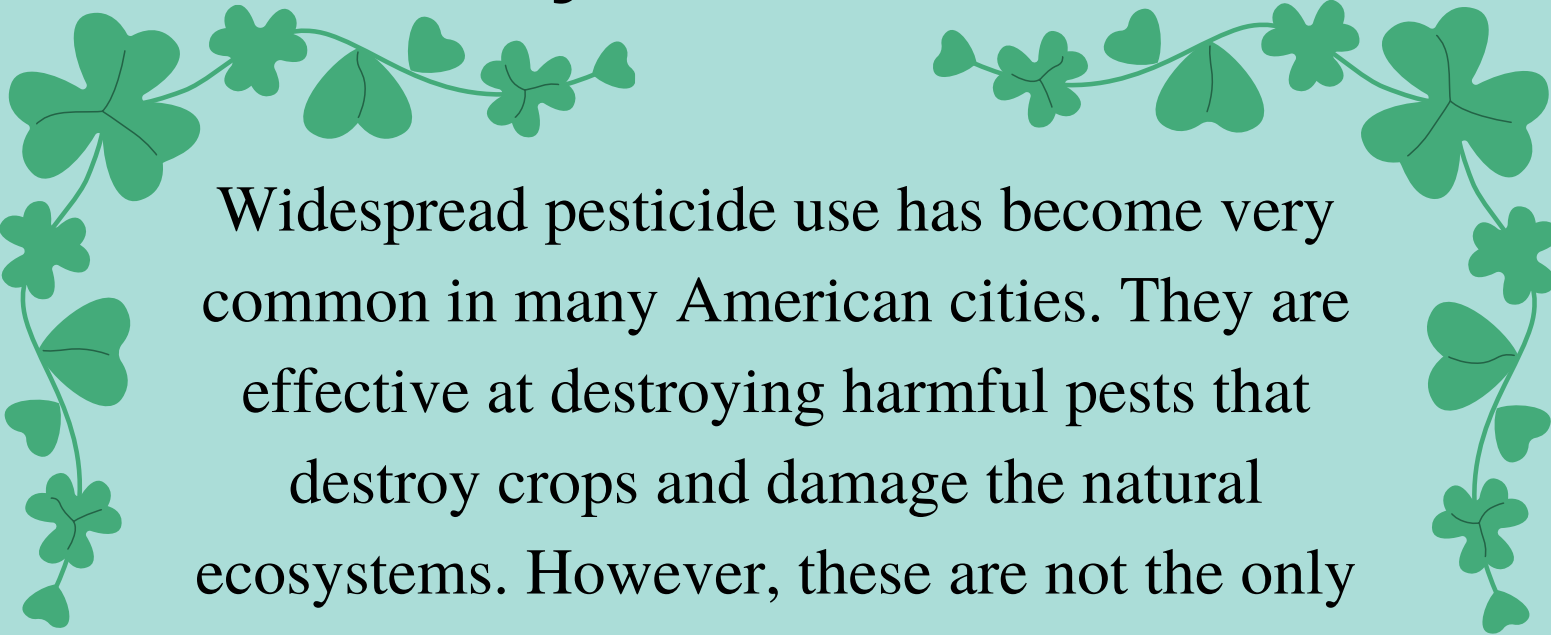
Organochloride compounds like BHC and DDT were discovered to be effective insecticides in the 1930s and 40s despite having been discovered much earlier. During World War II, DDT toppled pyrethrins due to its inexpensive and simple application. However, only 3 decades later, the EPA gave orders to stop DDT use due to rising insect resistance, harmful environmental effects, and research into exposure. Since then, many more synthetic herbicides and insecticides have been released onto the market.

Glyphosate became the top herbicide after its introduction in the 70s and 80s, but like DDT, has run into possible health risks. Neonicotinoids, the most popular family of insecticides, are similar to the nicotine compounds discovered in tobacco plants. By disrupting nerve impulses in insects, neonicotinoids paralyze and kill. Unfortunately, they are effective against bees as well as pests, leading to connections with bee colony collapse disorder.

From its start thousands of years ago, pesticides have been an important resource in agriculture. Despite their usefulness in protecting crops, modern pesticides have harmful and adverse side effects.

Natural Pesticide Alternatives

By: Jason Hu



Widespread pesticide use has become very common in many American cities. They are effective at destroying harmful pests that destroy crops and damage the natural ecosystems. However, these are not the only organisms that are adversely affected by these pesticides. These toxic chemicals also pose a threat to animals in the surrounding area, as well as humans that may accidentally ingest it. For these reasons, natural alternatives provide many advantages over their synthetic counterparts. They are both beneficial to the environment, and present no dangers to the organisms in the vicinity.



There are a multitude of these organic options available, ranging from DIY sprays to industrial grade solutions. One of the most common and effective natural pesticides is neem oil. Although commonly used for medicinal purposes in the past, it is also a great pest repellent. Neem is a plant with leaves that can be crushed up and its oil extracted. This oil has a very strong odor and bitter taste, which deters insects from harming one's plants. It is best used on young plants, allowing them to grow, and its effects can be seen for more than 20 days. Another very easily obtainable organic pesticide is salt spray. As the name suggests, salt spray is made with a mixture of salt and water. This solution discourages pests from harming your plants, but also increases nutrient absorption. It allows the plants to intake more nutrients from the soil, fostering growth and prosperity.



Lastly, many corporations have begun to make natural herbicides as well, one of the most prominent being Wondercide. Wondercide is an all-natural spray that kills pesky bugs and doesn't damage the native plants. It acts very quickly and lasts a long time, meaning that not many applications are required. It is very effective against insects such as ants, ticks, and mosquitos, and is 100% environment friendly and safe for children. In addition, it comes at a price comparable to the toxic pesticides that many people buy. It costs about \$75 for 2 gallons, which compares similarly to most other pesticides, and is even cheaper than some options. Overall, there are many natural sprays that can be found with great functionality, while preserving the environment. They are very convenient to make and are much safer, preventing people from being exposed to toxic substances.





Breaking down Pesticides in Food

Sunny Xiao

We've talked about the impact of pesticides by skin contact, such as running and playing on chemically treated grass fields, but what about its effect on us when we ingest them? How do pesticides affect us through the food we eat?

Pesticides are not a foreign term to agriculture. In fact, even thousands of years ago, our ancestors living in ancient Mesopotamia used elemental sulfur as protection for their crops. But in the past century, its use has exponentially grown -- and for the worse.

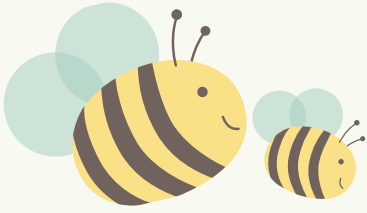
One of the most widely-used chemicals is glyphosate, more known as one of the key components of RoundUp, an herbicide. This chemical is possibly carcinogenic, and is infamous for being the subject of a lawsuit in 2019 by a man claiming the chemical caused his non-Hodgkin's lymphoma. Unfortunately, it has been found in numerous products, ranging from Honey Nut Cheerios to Nature's Valley Granola Bars.

Thankfully, we have gradually moved away from these pesticides as the world shifts towards a more green industry. Terms like organic and all-natural are found on more and more labels as brands like Simple Truth become increasingly popular. But do we really know what these labels mean?

Many associate the word organic with a product produced by pesticide-free crops, but that isn't the reality. The crops are still being treated by pesticides better known as biopesticides, which naturally occur. However, they are not perfect by any means; rotenone, an organic insecticide, is toxic to fish, while some horticultural oils can harm bees.

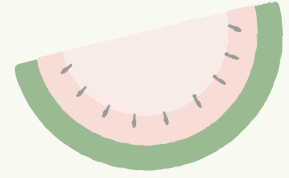
All-natural products are even less regulated. In contrast to the list of organic pesticides the USDA regulates, "natural" is simply defined as something with no artificial ingredients or added color, explaining why Cheetos can be classified as "natural." While animals should not be raised with hormones or antibiotics if their meat is to be classified "natural", many food manufacturers still place "natural" labels on animals raised with antibiotics -- and this is legal.

At the end of the day, it is nearly impossible to avoid our consumption of pesticides; even organic and all-natural produce is still legally allowed to be in contact with pesticides. But given the shocking effects of pesticides on the environment and human health, we should accelerate the transition away from all inorganic pesticides and look towards pesticide-free farming options suitable towards supporting an ever-growing population.



NEONICTONIDS: A SILENT KILLER

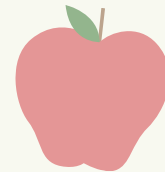
Sophia Ai



Neonicotinoids are a popular choice for use in agriculture. At first glance, it seems harmless, effective, and efficient to boot. However, underneath this guise, neonicotinoids have been slowly killing off our most important pollinators: Bees.

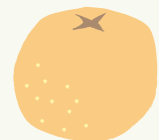
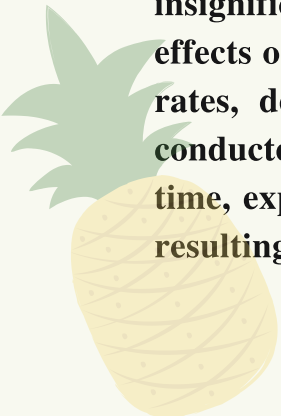
How do neonicotinoids work?

Often used to coat seeds before planting, neonicotinoids are favored for their long term results against pests and insects such as aphids. Seedlings can be protected up to 10 weeks per use which is especially important for the most vulnerable phase of plants. As a result, neonicotinoids have become one of the mostly widely used insecticides around the world since its introduction in the early 1990s. It's effective and cheap, so what is the issue? When we take a closer look behind the scenes, the reality of this insecticide is much more sinister than it seems.



How do neonicotinoids affect bees?

As seeds are planted coated with neonicotinoids, the chemicals are then absorbed through the roots and become present in almost every part of the plant as it grows. Unfortunately, this does not exclude the plant's pollen and nectar, exposing pollinators to toxic chemicals. While the impacts on a single bee seem insignificant, the effects are profound throughout bee populations. Long term effects on honey and native bees include higher mortality, reduced reproduction rates, decreased feeding, and impaired movement patterns. Various studies conducted by researchers and universities have found that over long periods of time, exposure to neonicotinoids has caused increased rates of colony collapses, resulting in the decrease of bee populations across the globe.



Formatted by Lynne Xu

Why should we care?

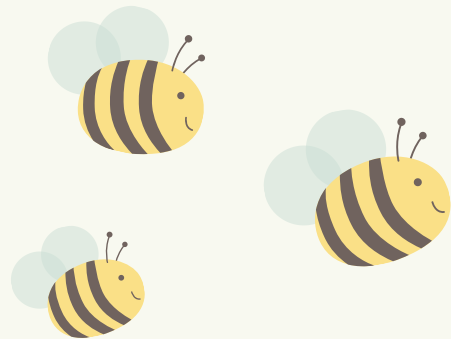
Simply put, if we continue to ignore this issue, we are putting the global food supply at risk. Out of all the food we consume, one third heavily relies on bees. In the US alone, studies approximate that 80% of our crops are contingent on bees for pollination. If that was not alarming enough, in 2019, we saw 40% of bee colonies in the US die. This trend will only continue and worsen as time goes on, detrimentally affecting livelihoods. You can kiss your favorite fruits and vegetables goodbye if no action is taken.



How can we help?

There are only two ways we can stop the decline of bee populations: reduce the use of neonicotinoids or stop using them at all. However, there is little to no government involvement. The Environmental Protection Agency (EPA) still continues to permit the use of neonicotinoids, and even after becoming aware of the harm they do, they have been incredibly slow at taking action.

Even though this may be the case, there are still ways to save the bees. In your own garden, consider switching to organic alternatives and avoid synthetic products. Educate yourself on the issue and help your local community by spreading awareness. If we all work together, we can make a difference.



HOW TO REDUCE PESTICIDE EXPOSURE

In the US, over 4.5 billion pounds of pesticides are used each year, with 75% used in agriculture and 25% in homes and gardens. The prevalence and widespread use of pesticides has increased our exposure to a variety of chemicals, this infographic seeks to inform you of the ways to reduce that exposure.

by Josh Tang

1 WASH FRUITS AND VEGETABLES BEFORE EATING

Commercial fruit and vegetable washes are available at your local supermarket. These washes are formulated to remove chemical residue from your produce. If you aren't able to get these products you can still clean your produce by rubbing produce while holding under plain running water

2 HAVE A 'NO SHOES' POLICY IN YOUR HOME

When visitors to your home walk across any surface that has been treated with chemical fertilizers and herbicides, residue from these chemicals may be tracked into your home. Having a 'No Shoes' policy will help reduce the amount of chemicals tracked in

3 BUY ORGANIC AND LOCALLY GROWN FRUIT AND VEGETABLES

Buying in season, organic produce is a great way to get pesticide-free produce. To identify fruit grown organically, look at the little sticker - the number should be five digits and start with "9" (e.g. 94223). Your local farmers market is also a good place to find organic produce

4 KNOW WHICH FRUITS AND VEGETABLES HAVE HIGHER LEVELS OF PESTICIDE RESIDUE

Learning which fruits and vegetables have higher levels of pesticide residue can help you identify which produce you should be taking extra precaution to clean. You can learn more



5 GROW YOUR OWN PRODUCE

A backyard garden as small as 400 sq. ft. can provide much of the required produce for a family of four. You can use organic methods in place of chemical fertilizers and chemicals. Tending the garden is also a healthy activity for children. (Even homegrown produce should be washed before eating)

6 PREVENT PESTS FROM ENTERING YOUR HOME OR GARDEN

Prevent pest problems by cleaning house, laundering pet bedding, and performing regular yard and garden maintenance to remove places where pests can live and feed. Pests need shelter, food, and water to survive. If you have less pests there will be a reduction in pesticides used

WRITING TEAM

July Newsletter



EDITOR IN CHIEF: LYNNE XU

Hi, my name is Lynne Xu and I am currently a rising senior at Torrey Pines High School in San Diego. I play golf, flute, and am interested in science. Especially since I am a golfer, I believe that keeping our outdoor areas safe, healthy, and organic is very important, which is why I strive to create a non-toxic San Diego.



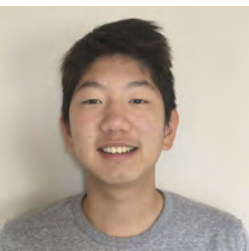
BRYCE TIM

Hello, I am Bryce Tim, a sophomore at La Jolla High School. I enjoy swimming for my high school team and I am certified in keelboat sailing. I have always been an advocate for environmental protection since I was a little kid. Being a Non-Toxic member allows me to work with others who share my passion.



FLORA YUAN

Hi! My name is Flora Yuan and I am a rising junior attending Del Norte High School. I enjoy singing, writing, running, and traveling. I also care a lot about the environment, including the harmful effects of pesticides on our communities. I hope to provide awareness on the detrimental effects of pesticides, as well as encourage many local communities to go pesticide-free.



JASON HU

Hello! My name is Jason Hu and I am a rising junior at Westview High School. I enjoy watching sports, playing tennis, and playing the clarinet. Although I was born in Chicago, I have developed a love for Southern California's natural landscape and environment. Through Non-Toxic San Diego I hope to raise awareness on the consequences of using pesticides and strive to keep our community clean.



SUNNY XIAO

Hi, my name is Sunny Xiao and I'm a rising senior at Canyon Crest Academy. I enjoy playing piano and reading, and am involved with numerous clubs encouraging educational equality. I joined Non-Toxic San Diego because I believe an organic environment with pesticide-free grasses safe for children to play on is important for a clean future.

LAYOUT TEAM

July Newsletter



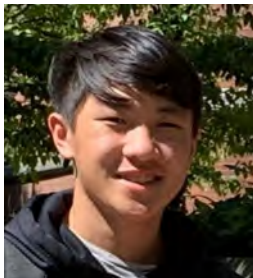
ALYSSA KUANG

Hello, my name is Alyssa Kuang and I'm currently attending the Bishops School. I love music, learning new things, and playing sports. I've always wanted to be an active member to contribute for environment initiatives. We work hard to try to make a positive change in our neighborhood, even a small one. I hope that we can make our parks toxic free.



GRACE HE

Hi, my name is Grace He and I currently attend Westview High School in San Diego. I love to travel and learn about the cultures of different places and peoples. I have also always been passionate about protecting the environment and I want to be able to make a difference in the place I live by making the community at least a little better.



KEVIN ZHUO

My name is Kevin Zhuo and I am currently attending Torrey Pines High School at San Diego. I enjoy swimming, writing, and I also love nature. Joining non-toxic San Diego has empowered me to do research and spread awareness of the effects pesticides bring to water, especially in places where many people go to swim. I hope to continue our mission to make the community a healthier place for everyone.



JOSHUA TANG

Hello, my name is Joshua Tang and I am a freshman at Scripps Ranch High School. Some of my favorite hobbies include drawing and badminton. My love for drawing and design has followed me since my early childhood. I lie to use badminton as a child, but picked it back up recently and it has developed into an enjoyable hobby. As a member of NTSD, I hope to raise awareness and hopefully make San Diego's parks a little less toxic.