

Pesticides



What are pesticides?

The U.S. Environmental Protection Agency (EPA) defines a **pesticide** as “...any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest (EPA, 2016).” A **pest** is a plant or animal that threatens human food supplies, health, or safety (Delaplane, K.S., 1996). In simpler terms this means that a pesticide is something you use to get rid of something you do not want, often when farming.

Pesticide is a very general term, however. To better understand what they are and what they do, we break them down into the types of pests they fight which include fish, birds, and bacteria. Among the most common types are **insecticides**, **herbicides**, **fungicides**, and **rodenticides**.

History

Pesticide use is actually an ancient practice that evolved with the development of agriculture. The Sumerians began using sulfur to keep crop-damaging insects in check 4,500 years ago; 3,200 years ago the Chinese used mercury and arsenic on body lice. In the early years of pesticide use, methods for reducing crop loss were developed from plant and animal material or from mineral compounds found in nature. Dried Chrysanthemum flowers were used to make a potent insecticide known as Pyrethrum. The combination of copper sulfate and lime or Bordeaux mixture, after the region in France where it was developed, is still used as a fungicide.

The development of synthetic or man-made pesticides proceeded slowly until the 1940s when a whole slew of chemical treatments such as DDT, parathion, and captan were created. DDT, or

dichlorodiphenyltrichloroethane, in particular was a revolutionary addition to pest management with its low cost, ability to fight insect-borne diseases like malaria, and apparently minimal effect on mammals. Dr. Paul Miller won the Nobel Prize in Medicine in 1949 for the development of DDT (Unsworth, 2010). Evidence of its ill effects became clear, however, and use of DDT was banned in the United States in 1972 (EPA, 2015).

Reading Sample



This section has been removed

With Purchase



Google Access

Thank you for your purchase. Clicking the link button below will automatically create a copy of your resource inside your Google Drive. You'll find the file inside the 'Shared with me' section on the left side of your Drive.

Important: Before you click, make sure you're signed in to the Google account you'd like the resources placed into. If the resources are added to the wrong account, simply sign out and then into the correct one and repeat the process.

[Click here to place a copy directly into your Google Drive Account](#)

TWF

have more recently become important in the battle against the Zika virus, another disease spread by mosquitoes (Romo, 2016). Insecticides also minimize the spread of Lyme disease, which is carried by ticks, and disinfectants help stop the spread of bacteria.

Improved Safety

Pesticides also help humans by keeping our homes and roadways safer. When insects and fungi infect the wood in our houses, that wood becomes weaker. Eventually, it may become so weak that it can no longer support the people and possessions that are in the house, leading to serious accidents. Homes today are often built with pesticide-treated lumber. Herbicides are often used to control plants that grow up around traffic signs, making drivers unable to see and follow their instructions, possibly leading to crashes (Whitford, et. al., 2009).

Costs

Ecobottle Sample



This section has been removed

Other people are affected when pesticides get into our drinking water or are not properly cleaned off of our food. The effects vary based on the specific chemical involved but include headaches, liver disease, respiratory problems, and cancer. (Aktar, Sengupta, and Chowdury, 2009).

Organic Alternatives

For those farmers, gardeners, and shoppers who are wary of pesticides, there are alternatives. Often, it is important to work with nature using the pest's natural predators to keep it in check. This is known as **biological pest control**. For example, ladybugs are harmless to food crops but deadly to aphids. Parasitic wasps are another very effective means of biological control; they lay their eggs inside pest species and the larvae eat their way out, killing the pest. Planting other crops alongside the main crops can also minimize pest infestations. Mustards are a good example of such a **bio-fumigant cover crop** capable of reducing the population of microscopic worms called nematodes.

Ecobottle Sample



This section has been removed

Reading Comprehension Questions

1. What
2. Name three types of pesticides.
3. Who
4. What insect spreads malaria, West Nile virus, and the Zika virus?
5. What
6. How are people exposed to pesticides?
7. Name
8. What is biological pest control? Give an example.

Extension Questions

9. The impacts of pesticides on bees are often in the news today. Research how bees are affected, including a definition of colony collapse, and explain how the loss of bees would affect people.
10. Explain

Ecobottle Sample



This section has been removed

TWF READING

References

- Aktark, M.W., Sengupta, D., & Chowdhury, A. (2009, March). Impact of pesticides use in agriculture: their benefits and hazards. *Interdisciplinary Toxicology* 2 (1), 1-12.
- Caldwell, B., et. al. (2013). Resource guide for organic insect and disease management, 2nd Edition. Geneva, NY: Cornell University.
- Delaplane, K.S. (1996). Pesticide usage in the United States: History, benefits, risks, and trends. Cooperative Extension Service, The University of Georgia.
- Griswold, E. (2012, September 21). How 'Silent Spring' ignited the environmental movement. Retrieved 30 March 2016 from:
http://www.nytimes.com/2012/09/23/magazine/how-silent-spring-ignited-the-environmental-movement.html?_r=0.
- Romo, R. (2016, February 18). Brazil, world health officials deny link between pesticide and microcephaly. Retrieved 29 March 2016 from:
<http://www.cnn.com/2016/02/17/health/brazil-who-pesticide-microcephaly-zika/>.
- Stephenson, G.R., et. al. (2006) Glossary of terms relating to pesticides (IUPAC Recommendations 2006). *Pure and Applied Chemistry*, 78 (11), 2075- 2154.
- Unsworth, J. (2010, May 10). History of pesticide use. *International Union of Pure and Applied Chemistry*. Retrieved 22 March 2016 from:
http://agrochemicals.iupac.org/index.php?option=com_sobi2&sobi2Task=sobi2Details&catid=3&sobi2Id=31.
- U.S. Environmental Protection Agency (2015, November 5). DDT – A brief history and status. Retrieved 22 March 2016 from: <https://www.epa.gov/ingredients-used-pesticide-products/ddt-brief-history-and-status>.
- U.S. Environmental Protection Agency (2016, March 11). Basic information about pesticide ingredients. Retrieved 21 March 2016 from: <https://www.epa.gov/ingredients-used-pesticide-products/basic-information-about-pesticide-ingredients>.
- Whitford, F., et. al. (2009, February 9). The benefits of pesticides: A story worth telling. Purdue University Cooperative Extension Service.