

Understanding Pollution: Are We in Danger of Famine?

When looking at history there is one thing that allowed mankind to stop their nomadic lifestyle, and begin to construct civilization as we know it. That is agriculture. A reliable and steady food supply has allowed us to construct cities, build wonders that will endure for centuries, and even reach for the stars themselves. Without that consistent food supply man would never have experienced such a population boom that made us the dominant animal on this planet. Yet despite the importance of agriculture to our successes, we are allowing our food supply to be placed in danger by pollution. The most dangerous threats to our food supply come from air pollution, water pollution, and global warming.



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Photograph by Karina Norton

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Air is everywhere, and thus whatever is in the air affects everything. One of the biggest dangers to agriculture from air pollution is ozone. Ozone is the main component of smog that is created by the burning of fossil fuels.ⁱ Ozone can have varying effects on agriculture. To begin with ozone is absorbed by crops through the undersides of leaves, and cause a loss of color, molting, bronzing, and/or stunted growth of the plant.ⁱⁱ Here's where things get complicated. Ozone can cause both visible injury to plants, and reduce the size of the crop as a whole, or it can cause no visible injury while still reducing the crop size, or visible injury but without reducing the crop size.ⁱⁱⁱ Ozone damage is simply one factor. You must also consider the type of plant, and other environmental effects that are acting at a given time. Another air pollutant dangerous to agriculture is fluoride.

Fluoride can be absorbed by plants through the tips of their leaves, but that is not where damage is visible. The damage is done to the youngest leaves on the plant, and it can drastically effect the size of the plant.^{iv} Needless to say, there are entirely too many air pollutants to list all of them, and their effects on every type of agricultural crop out there. As long as the air that humans, plants, and other animals rely on is polluted there will continue to be a growing number of consequences.



Water is vital to every organism on this planet. It should come as no surprise to anyone that water affects agriculture from the time a seed is planted until it enters our mouths. Fruits and vegetables come into contact with water throughout their, for lack of a better word, lives. To begin with irrigation is used to water crops as they are grown. If the water used in irrigation is contaminated then that contaminant is being absorbed by the crops along with the water. Fresh water can be contaminated by heavy metals, dirt and rocks, chemicals, and industrial pollutants. Some of the heavy metals that are commonly found in fresh water are arsenic, cadmium, chromium, copper, nickel, lead and mercury.^v I don't know about you, but I'm pretty sure I don't want to eat anything that has absorbed lead, which has been linked to neurological impairment in children, let alone all of the other chemicals.^{vi} Just a few more examples are Cadmium which weakens your bones, can cause kidney damage, and even lead to death in high enough levels.^{vii} Then there is arsenic which has been linked to several forms of cancer.^{viii} Aside from metals you also have different chemicals that are either dumped into water, or found there naturally. Think of the pesticides that are used on lawns, and then carried off into the nearest water supply when it rains, or the chemicals that

people use to wash their cars. Then think about the chemicals from industrial plants, runoff water from manure, and runoff from septic systems.^{ix} All of those chemicals end up in our water supply. Water is connected to literally everything, and because of that literally anything can find its way into our water supply which then goes on to water the crops upon which we rely for food.



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There is another effect that pollution is causing that is effecting our water supply, and that is global warming. I won't go fully into the whys and wherefores of global warming here, as that has been covered in another article, but global warming's effect on agriculture must be mentioned. As mentioned earlier crop growth relies upon a variety of factors in order to produce the optimal sized crop, and one of the most important factors is the weather. Global warming is beginning to alter weather patterns around the globe.^x Since certain crops do better in different environments if the weather of that environment changes it will have an impact on the crops grown there. Desertification is the most obviously severe examples of this. Desertification is occurring as global warming is drying up water supplies, and literally turning once arable land into deserts.^{xi} This is obviously effecting what can and cannot be grown in a given area, since many crops cannot be grown in a desert environment. Another problem is that the majority of Americans are predominantly meat eaters, and a significantly larger area is required to raise crops that feed the livestock used for food. It is estimated that about 800 million people in the US could be fed with the grain required to feed the animals we eventually eat.^{xiii} That is only the most extreme example, and while it is true that some crops will be able to adapt to changing climate, it is estimated that

by the middle of the century most crops will have reached their capacity for adaptation.^{xiii} What that means is that although we shouldn't have to worry about our food supply too much for the next fifty years, we might have some serious problems in a few decades. For those of us who are under thirty that means that we will definitely run into problems at the latest by the time we're ready to retire. Do you really want to spend your retirement worrying about if you'll have enough food? I don't, which means that something must be done now to ensure that doesn't happen.

Agriculture is probably one of the greatest innovations that ever happened to the human race. It allowed us to move out of our nomadic lifestyle and to develop science, art, music, philosophy, literature, and other technologies and forms of leisure because we didn't have to worry about literally running down enough food to keep us from starvation. For the past couple millennia we have relied upon agriculture to allow us to explore the world around us, as well as our own minds, and other planets. Can we really allow the advancements of the new generations turn our food from nourishment and medicine into poison? I don't know about you, but I don't think I could run down a gazelle for its meat, and while picking berries can be fun, I would need a lot of berries to feed my family. Plus, if technology continues to advance and feed pollution, will the berries be safe to eat and will there even be gazelles left? We have to do something if we are to continue to enjoy living the lives that we want.

About the Author



Dominick Principe is a graduate of Rowan University with dual Bachelor Degrees in Elementary Education and Writing Arts. He is a prolific reader who devours any book put before him, and feels that life is one great long book without an end. He fills his hours constantly exploring new information, and seeking to educate himself in the ways of the world. He puts all of that knowledge and his passion for learning to good use teaching English as a second language to students of all ages. When his nose isn't buried in a book, or in class teaching, then he can generally be found typing away at his computer working on some random piece of writing that he was inspired to do.

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ⁱⁱ "The Effects of Air Pollution on Agricultural Crops." *Home Guides*. San Francisco Gate. Web. 14 Nov. 2014. <<http://homeguides.sfgate.com/effects-air-pollution-agricultural-crops-79226.html>>.

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