SOIL STORIES: WHY GOOD FOOD STARTS UNDERGROUND

by Rebecca Tyers

Healthy soil is where good, nutritious food begins. Our earth is covered in it, with over 70,000 kinds of soil having been identified in the U.S. alone. But soil is yet to have found its glamorous place alongside other buzzwords like "organic" and "non-GMO". And while these buzzwords are essentially directly connected to the soil, many people who swear by them have no idea what healthy soil even looks like. While positive awareness grows around food, there is one question that has yet to take hold of the public conscious in a big way - how healthy is the ground our food grows in?

On a Thursday morning I am on my hands and knees in a poly tunnel pruning tomato plants. It's July, unusually hot for the U.K., and the tunnel is a jungle of deep red, orange and yellow varieties, all looking plump and delicious in the sweltering heat. I pick one straight off the vine and pop it into my mouth; the taste is an explosion of sweetness, a word not often used to describe the taste of tomatoes. However, the thing I've come to realize from working on a small-scale organic farm is that most people have never really tasted a tomato. You may buy tomatoes from your local supermarket and eat them religiously, but pick an organic tomato straight off the vine and the watery, tomato-like thing that you bought from the supermarket will never suffice. Why is this? How can the same fruit taste so different? Aside from the fact that these two tomatoes may have grown on different farms, possibly in different climates and maybe even in different countries – the main difference is in the soil. The reality is that even if these two tomatoes were grown on neighboring farms, one can still taste flavorless, while the other is like a perfectly formed treat from the tomato gods. Farming is an art form in itself, and to form real, high-quality produce takes time – time that many farmers don't have.

If I want to grow a carrot I need enough nutrients in the soil for my carrot to grow - nutrients that I can then absorb when I eat the carrot. The reality is that if our food is being grown in soil that has very little nutritional value, then that carrot we eat won't be giving us much of the nutrients that we believe it should. If we were to compare vegetables grown in 2018 to those from 1950, we would find that the nutritional value of today's food has greatly depleted in the last 70 years. While farming methods have, of course, changed dramatically since 1950, we would hope that with our technological advances came more nutrient-dense foods - surely that should be the main aim when it comes to food production? But the desire to produce more food in a short space of time has caused nutrition to slide down the priority list. We may believe that our carrots are offering us lots of vitamin K and might even help us to see in the dark, but in reality, if those carrots were grown in nutrient-depleted soil, then our chances of getting our hoped for nutrients from them is slim.

We all know vegetables need water and sunlight to grow, but one of the most important elements - along with potassium and phosphorus - that determines their health is nitrogen. When plants have a natural life cycle their nitrogen is returned to the soil when they die, and used by new plants to grow. However, by harvesting plants we disrupt this natural cycle and the supply of nitrogen going back into the soil is limited. Many conventional farms now use chemical fertilizer, which has been used for the last 100 years or so to fix nitrogen in the soil. These fertilizers are applied to the soil in an attempt to artificially increase nitrogen production and improve yield to feed our increasing world population.

While it is understandable why many people choose to support the use of these products, these fertilizers have effects far

beyond simply helping plants grow. It is believed that chemical fertilizers aid in growing plants faster and in higher yields in the short term, however, overuse of these products can lead to fewer and poorer quality crops in the long term. Soil is an intricate system and while we humans believe that we can 'fix' it using man-made chemicals, it isn't really that simple. Although plants may need the nutrients that are present in chemical fertilizers in order to grow, simply adding them all at once in a chemical concoction ignores the intricate balance needed to sustain healthy plants and soil.

Additionally, this large source of chemical nitrogen isn't so good for sea animals and plants either. The excess nitrogen can seep through the soil and into our water. Once in the water it encourages the growth of plankton and aquatic plants in excess. When these plants decompose they use oxygen in the water that other animals need to survive – scientists now label these as "dead zones", because the waters closest to the land where agricultural runoff is heaviest are empty of fish and crustaceans. In addition to the effects this has on animal health, continuous mistreatment of our soil will create further consequences, and could decrease food yields in the long term. In 2017 the UN urged farmers worldwide to move away from intensive farming methods, as they reported that 24 billion tonnes of fertile soil is being lost each year globally due to this way of farming.

On the flip-side, small-scale farmers – who mostly support organic methods, without the use of chemicals - encourage the renewal of soil naturally. Many supporters of large-scale, intensive farming argue that an intensive method of growing produces far higher yields in a short space of time. However, a 2015 study by The Royal Society – the most extensive of its kind to date – found that the gap between conventional and organic farming is not as big as previously thought. They reported that conventional farms have 19% higher yields than organic farms – however, they then compared yields on conventional farms to those on organic farms that use crop rotation and cover crops to build soil health. These techniques narrowed the gap to below 10%. Clearly, the argument that conventional farming methods produce far more food than organic is beginning to lose its credibility.

As a vegan in 2018 I find myself increasingly aware of the state of our world – I want to play no part in making things worse for people, animals or the planet. While it's positive that people are paying attention to healthy trends when it comes to food production, I feel it's time to take the conversation a little deeper. Beyond simply asking your local farmer for an organic apple, why not ask them what they're doing to encourage good soil health? Move away from supporting farms that aren't supporting our planet. The soil is host to the greatest collection of organisms on earth; I think it's time we paid greater attention to it. △

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2) https://www.scientificamerican.com/article/soil-depletion-and-nutrition-loss/
3) https://eponline.com/articles/2017/12/07/the-hidden-dangers-of-chemical-fertilizers.aspx
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5) https://www.theguardian.com/environment/2017/sep/12/third-of-earths-soil-acutely-degraded-due-to-agriculture-study
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