

# THE DIRT ON ORGANIC PRODUCE<sup>1</sup>

Michelle Venetucci Harvey<sup>©</sup>

Does growing organic really matter? Supporters of conventional agriculture say that organic farming is little more than a fad—and that organic produce lightens consumers' wallets for no tangible benefits. And unfortunately, since agro-ecosystems are so complex, scientists have had a hard time cutting through the haze of claims and counter-claims. Until now: a study led by Washington State University Regents professor of soil science John Reganold is one of the most comprehensive, persuasive studies yet to show the nutritional and environmental benefits of organic farming.<sup>2</sup> Its findings only apply to strawberries — but they do point the way to the kind of research that can, and should, be done with other crops as well.

The study design was both careful and comprehensive in scope. The strawberries were grown on 13 conventional and 13 organic fields, with organic/conventional field pairs located adjacently in order to control for soil type and weather patterns. The data was drawn from repeated harvests over a two year period, and the strawberries were picked, transported, and stored under identical conditions to replicate retail practices. And just as farming is a complex business, scientists contributing to the study range from soil and food scientists to genetics experts and statistics specialists, who analyzed 31 soil properties, soil DNA, and the relative taste and nutritional quality of three strawberry varieties in California.

The results are pretty convincing: organic strawberries are healthier, tastier, and better for the soil than conventional strawberries.

First, let's take a look at strawberry quality. Consumers buying organic products consistently cite the health benefits<sup>3</sup> of organic foods as a main purchasing motivation. Yet there is a general lack of conclusive data to back this up. However, the WSU study found that organic strawberries ultimately beat conventional strawberries in quality, based on a number of factors:

- Organic strawberry plants showed fewer instances of post-harvest fungal rots than conventional strawberries, despite the fact that no fungicides were used on the organic fields. The study notes this finding may prove that organic systems help defend plants against infection through systemic-acquired resistance rather than chemical inputs.
- Organic methods resulted in strawberries with increased antioxidants, vitamin C, and total phenolics. While phosphorus and potassium levels were higher in conventional crops, the study emphasized the importance of vitamin C and antioxidants in relation to human health; vitamin C from strawberries has been shown to have a direct, negative effect on cancer cell growth.

And for those who value flavor more than health, organic also outdoes conventional in taste tests. Consumer-sensory panels found little difference between two of the organic and

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<sup>1</sup> The Weekly Score, Sightline Institute, September 01, 2010

<sup>2</sup> Reganold, J.P., P.K. Andrews, J.R. Reeve, L. Carpenter-Boggs, C.W. Schadt, J.R. Alldredge, C.F. Ross, N.M. Davies and J. Zhou. 2010. Fruit and soil quality of organic and conventional strawberry agroecosystems. PLoS ONE 5(9): e12346. doi:10.1371/journal.pone.0012346

<sup>3</sup> Organic consumers have common values, Condor Project, <http://www.condor-organic.org>

conventional strawberry varieties, but preferred the organic “Diamante” variety for its appearance and sweetness over its conventional counterpart.

Then there’s the issue of soil quality. While consumers may be solely interested in the end result, farmers and food experts such as Will Allen and Wendell Berry have stressed that high-quality soil is the basis for healthy agro-ecosystems. California farmers have relied on methyl bromide (an ozone-depleting toxic fumigant) to sterilize their soil for decades, and as a result have reduced soil from a habitat for microorganisms into a growing medium devoid of nutrients. Despite the conventional practice of spraying soils with synthetic fertilizers, the study found that organic fields contained significantly higher amounts of nutrients. Organic and conventional soils contained similar levels of most extractable nutrients, but organic soil had higher levels of zinc, boron, sodium, and iron. Organic soils also performed better through a number of biological properties, such as enzyme activities, micronutrient levels, and carbon sequestration. But what’s perhaps most interesting in the study is the use of DNA analysis, which helped scientists establish that organic soils contain a significantly higher amount of unique genes and overall genetic diversity. In a time when global warming is creating increasingly unpredictable weather conditions, biodiversity is one of our greatest defenses against climate change (for more on this idea, look no further than activist and physicist Vandana Shiva, a compelling advocate of the social, economic, and health-related benefits of biodiversity).

Strawberry fumigants are a hot-button issue in California right now, making this study especially timely. While the negative effects of methyl bromide have been established, and it was technically banned under an international treaty back in the 1980s, the fumigant is still being used until a substitute can be found. However, the proposed methyl iodide, approved under the Bush administration in 2008, is possibly even more toxic than methyl bromide. In light of the study, this controversy is bordering on the absurd—why even look for a new fumigant when organic production clearly produces better soil quality, increased nutrient density, and doesn’t rely on chemicals that make farm workers sick?

For any naysayers out there who are clinging to the Monsanto line<sup>4</sup> that conventional agriculture is the only way to feed the world, while this study doesn’t delve into crop yields itself, a report put out by the Union of Concerned Scientists<sup>5</sup> may put that claim to rest. Despite the fact that in some instances conventional methods may marginally raise the yield of food crops (while genetically modified crops were shown to produce no increase in yield), this study notes it comes at a high cost to the environment and our health. The chemical inputs used in conventional farming are directly contributing to unpredictable climate changes, which will affect our long-term ability to consistently grow food.

It’s hard to argue against Dr. Reganold’s findings. Even while some categories of analysis produced similar results between conventional and organic strawberries, the fact that organic methods did not rely on toxic chemical inputs is a big, juicy point in its favor. Promoting organic agro-ecosystems means fewer people will be exposed to toxic chemicals, all in the name of producing a healthier, tastier piece of fruit.

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<sup>4</sup> Monsanto v. Food Inc. Over How to Feed the World, Michael Arndt, NEXT Innovation Tools & Trends, Bloomberg Businessweek, January 11, 2010

<sup>5</sup> Failure to Yield, Biotechnology’s Broken Promises. Union of Concerned Scientists, Issue Briefing, July 2009