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The Myth of Organic Superiority:
"Organic products are safer than chemicals"

The Myth

Recently I received an email from an internet reader who took issue with my column on compost tea. Among his comments was the following statement:

"…You talk about groundwater pollution and eutrophication of the watershed from overuse [of compost tea]. Yet, I don't know of any farmers that could afford to overuse the stuff. You don't mention that this kind of pollution results almost every time someone uses petrochemical salt fertilizers. It almost never happens when someone uses compost tea."

This excerpt exemplifies the popular belief that "natural" or "organic" products are superior to, and safer than, "chemical" products. A quick look through the internet reveals advertisements for "chemical free organic" fertilizer, compost, pesticides, compost, lawn, sheep, paint, nail polish, sesame oil, diapers, and even mattresses. In every aspect of our lives we are bombarded with the message that chemicals are bad and organic products are natural and safe.

The Reality

Before we can understand the "organic vs. chemical" controversy we need to clarify a few terms:

- Chemical: General dictionaries aren't really helpful with this definition. What is important to realize is that everything on earth, natural or otherwise, is composed of chemicals.
- Organic: In chemistry, this refers to any chemical compound, natural or synthetic, that contains carbon.
- Organic farming: The chemical definition of organic does not apply in this context. Instead, organic farming is partially defined as using only naturally occurring, rather than synthetic, chemicals. Therefore, chemical-free and organic are oxymorons, whether in a chemical context or in relation to organic farming. In a Google search, I did not find one dot-edu site with the phrase "chemical free organic;" I did find 304 dot-com sites, however.
- Pesticide: Any chemical, natural or synthetic, with the ability to kill a pest organism. Herbicides, insecticides, and fungicides kill plants, insects, and fungi, respectively. The use of terms "chemical free" or "non-chemical" in reference to any pesticide is illogical. No dot-edu sites contain such language (except anecdotally), but 45 dot-com sites do.

The perception of organic superiority is also common in health food literature; "organic" or "natural" sources of sugar (like fruit juice or honey) are promoted as being healthier than refined sugar. In fact, your body's enzymes don't recognize the difference between processed and unprocessed sucrose (or fructose). Any health benefits of trace substances associated with "natural" sugars are unsubstantiated.

In much the same way, living organisms in a landscape don't distinguish between nitrate from compost or from a bag of conventional fertilizer. It's simply a usable form of nitrogen. The other components of nutritional amendments might be beneficial, or neutral, or even harmful. All components of conventional fertilizers are listed on the bag; we have no such information on compost content. Furthermore, if too much of either nutrient source is added to a landscape, then excess nutrients will leach away from the site

and increase the nutrient load elsewhere. (My correspondent also wrote: "…home gardeners…don't farm enough land to pollute the water." Unfortunately, this just isn't true. Home owners use approximately 10 times more chemicals per unit area of land than farmers do [EPA figure]. In urban areas, this is obviously a major contributor to non-point source pollution.)

Lest I be mistaken for encouraging the indiscriminate use of conventional landscape chemicals, let me state that I avoid using any chemical in the landscape unless absolutely necessary. I fertilize my landscape plants when they show signs of nitrogen deficiency (the most common nutrient deficiency), and I use Roundup (sparingly) to reduce massive weed problems to a more manageable size.

So why do we think that "organic" is synonymous with "safe?" It's true that naturally-derived, organic products have a low environmental persistence. Nature is not benign, however; microbes, plants, and other organisms manufacture toxins, mutagens, and carcinogens as defensive strategies. To assume that products derived from biological sources can never pose a threat to human or ecosystem health is misguided and dangerous.

The Bottom Line

- Be conservative in what chemicals you add to a landscape, regardless of their source.
- Any organic substance, natural or synthetic, can cause environmental problems when added in excess of what a landscape system can absorb and utilize.
- It's not important whether a chemical is natural or synthetic. What is important is knowing the properties (like toxicity and environmental persistence) of chemicals we apply to landscapes.

For more information, please visit Dr. Chalker-Scott's web page at http://www.theinformedgardener.com.