



## **Science, Art, and “Science” in the Garden: Do Carrots *Really* Love Tomatoes?**

If you Google “soil health amendments” you’ll get some 890,000 hits. Scroll through the first 50 or so, and you’ll read advice calling for you to apply megadoses of compost to your garden, use kelp meal to increase plants’ frost resistance and for rapid fruit set, use moderate applications of compost each year, and use products that contain such miracle ingredients as molasses, slate particles, and Arctic humus. With such far-ranging and contradictory recommendations, it can be hard to separate the wheat from the mountains of chaff.

Gardening seems usually too pleasant, to involve much biology, chemistry, or physics, but you don’t have to look too hard before you find it’s all there. Biology is the study of living organisms, such as the billions of microorganisms that are found in healthy soils, the life cycles of the various insect and disease pests we want to keep in check, or the very crops we want to thrive. The lime and fertilizer recommendations in your soil test report are based on the exact same chemistry principles you learned in school. And the laws of physics certainly don’t stop at the garden gate; they affect everything from how water drains from soils to the best way to remove that boulder that heaved up this year without breaking your back.

Applying these principles can lead to dramatic improvements in the health and productivity of our gardens. By testing the soil regularly, we can maintain its fertility. By understanding the life cycles of various insects, weeds, or fungi, we can arrange our crops to take advantage of relationships that encourage beneficial predators or pollinators, or to repel or confuse pests. We can even take advantage of radar images and computer models to find out whether it’s safe to plant tomatoes or if there’s a good chance of frost in the near future. If the particulars of the pH scale or plant growth weren’t your forte back in high school, that’s where your local Cooperative Extension office can help.

Now, there are so many biological, chemical, and physical processes and principles at play in a garden that it’s often easier to play things by ear a bit. I suspect most gardeners temper the science of gardening with their experiences that differ slightly with the by-the-book approach or a healthy dose of common sense; they recognize that to garden is to work with living organisms and complex systems, most of which don’t read the book. This is the “art” of gardening, and it’s often what makes gardening so enjoyable. Rather than fret over every detail, we wing it. We test the soil regularly, but most of us aren’t above occasionally throwing an extra shovelful or two of compost in for good measure. Providing good habitat for beneficial insects can make for an unruly garden, but we don’t mind because we know they’re out there doing their job. The weather forecast may say you’re safe from frost, but you bring in the seedlings on a hunch, and the next morning you’re glad you did.

Some of the information out there is presented with impressive sounding terms and experimental results, but really has no basis in what we’ve learned about plants and soil over the past two hundred years. Often, this “science” is used to prove the value of a product – a miracle soil amendment that tinkers with electromagnetic fields, or a plant “biostimulant” (as if your Swiss chard needs the equivalent of your morning coffee)– that some company wants you to buy. Centuries ago, people planted and harvested according to the phases of the moon and signs of the zodiac because they didn’t have calendars or they couldn’t read them. Despite the progress we’ve made, there are still some who claim that watching the skies is still the best way to garden because the planets and stars exert some mysterious influence. Some lay out gardens according to plants that are compatible or incompatible not because of an ability to attract pollinators or repel pests, but according to “chromatogram” patterns made from plant extracts. There’s simply no credible research behind these claims, and putting too much stock in them is usually a waste of time and money.

A healthy respect for the science, a healthier dose of skepticism for the “science”, and a nod to the art of gardening usually makes for the most enjoyable and productive gardening season.