Hi Matt,

First, thanks for your feedback regarding our compost. In the last year, we have had a few gardeners that have come to me with similar experiences to yours. I've visited their yards and then have been able to replicate their experiences in my own garden to address these concerns. Here is what I have discovered. With the ongoing drought, many water conscious gardeners have put in drip systems to keep / maintain a more contained output. Some of the drip systems being sold, promise, and do deliver, tremendous water savings. The question is are those water savings the result of reducing waste, or from depleting the soils water content?

To keep it overly simple, soil needs water not just for the plants, but for the millions of soil dwelling organisms that live in just a spoonful of soil*. If nature, or we, apply vegetative matter to the surface (think autumn leaves or compost), a diverse community of bacteria, fungi, nematodes, protozoa, earthworms, and arthropods "consume it" and draw it into the soil. It is after this "consumption" that nutrients become available to plants. Just like you and I, the compost consumers need water to survive and carry out their activities in consuming the compost.

In a natural setting, water comes from rain, and the moisture lands on the surface of the organic matter then migrates through it to the soil. Once the organic matter / compost is damp, it is then able to be "processed" by these soil organisms who utilize the water in the organic matter as part of their metabolic needs.

Tubular drip systems are very adept at putting the water in specific locations. The trouble is that the water drips downward, and since these tubes are below the compost, now no water flows through the compost. Hence the compost becomes extremely dry by baking in the hot desert-like weather of Southern California. All the organisms that normally would be in the organic layer, quickly leave this now arid stratum, and the compost becomes dormant. The individual particles of the compost become stiff and appear "shavings" like. Think of a cardboard box. When dry, it is very stiff and can hold all your old college textbooks. Yet add a little water to it, and the bottom instantly collapses.

Any compost or soil that is baked in the hot sun and whose moisture level drops below a critical percentage will become hydrophobic, meaning that it will initially repel water. Slowly restoring just a small percentage will prevent this condition. Even overnight fog is enough to wet the soil to prevent this. Again because water is being applied below the compost in drip systems, the compost surface itself will not receive water for months and months. Hence the moisture level drops to near zero, and hydrophobicity occurs.

After experimenting in my garden (which utilizes the Netafim drip system) I've done two things. First, I raised my drip lines so that they are on the top surface of the compost,

not buried below. Now the water emitted starts on the surface of the compost, and then wets it as it passes through. Second, I doubled up on the recommended lines required (and adjusted the time downwards to compensate). Initially I followed the design criteria that was recommended by Netafim, but found that the productivity of my garden dropped. By adding the additional tubes and raising them this summer, what was a rather lackluster growing season before, now has returned to a bumper crop.

I have also seen systems where a single emitter is placed at the base of the plant, watering just a few inches. All the surrounding soil is parched. The result is that the roots (which bring nutrients and water to the leaves) now only have a very small volume of soil to draw from. Please note that all plants have a symbiotic relationship with fungi that bring nutrients and water from as far as 10 feet past the root zone, or more, from the base of the plant**. This fungi needs water, so where the soil / compost is allowed to dry out, the fungi stops decomposing the organic matter, thus stopping any nutrients being brought to the plant's roots. The result is that less nutrients are available to plants. A simple calculation using the 10' radius example above (with full watering), means that there is 315 square feet of soil surface area that could be contributing to the vigor of a plant. Now change from sprinklers to a single drip emitter with a 6" spray, and you are reducing those nutrients available to your plant by 1/400 or .025% of the original amount.

Compost is designed to be a soil amendment. Meaning that it is a food source for the soil organisms that then convert it into nutrients that plants can utilize. It is not a planting medium. The original use of the word "organic" refers to adding carbon based amendments rather than non-carbon base amendments (such as ammonium nitrate fertilizers.) The first takes time for the soil organisms to process the soil amendment by going through numerous digestion cycles. The latter provides instant, but very shortly lived, benefit to the plants. Commercial potting media are more inorganic than organic. While they may start with a compost base, significant amount of fertilizer, water holding gels, vermiculites, etc. are added to maximize seedling vigor.

If I have a brand new garden, I would start my seeds in a commercial growing medium. At the same time I would add compost to where the seedlings are eventually going to be planted. This will allow the native soil organisms to begin digesting the compost, so that some nutrients are available once the seedlings are transplanted. As the seedlings mature into plants, I would add additional compost. Remember, not only are you amending the soil for this year's crop, but more importantly you are building the soil for future years. By the second or third planting cycle, you can most likely plant directly in the garden. Also if this is your plan, make sure that any compost you added in the prior planting cycle has mostly been drawn into the soil. You don't want to add a few inches, and then shortly thereafter try to plant seeds. Remember that seeds grow in soil, not compost.

Our compost carbon to nitrogen ratios average around 25:1. Even if it were pure shavings, (500:1), adding the proper moisture would cause it to decompose. Yes it

would be slower, but would eventually break down. When folk use terms like dusty, hard, etc., this now tells me that the irrigation systems are typically the culprit. FYI All the photos at our website, except for two, were taken in my backyard which serves as the testing ground for each year's product. I only use compost from our company.

Thanks Matt for taking to bring this issue up. You have spurred me to spend some time to develop a comprehensible response to this concern. I'm also creating a video that goes deeper into the role watering plays in the success of a garden. I hope to have it done by the end of October.

* An excellent and scientific source of soil information is the federal government's Natural Resources Conservation Service. I would recommend reading their Soil Primer as a start. http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/biology/

Or another great publication of theirs is the Urban Soil Primer. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/16/nrcs143_019170.pdf

**Here is a link to their page on soil fungi. When I first learned about the critical role of soil fungi, it seemed too amazing to be true. But over the years hard academic science has validated these claims. http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/biology/?cid=nrcs142p2_053864

In addition, here is a great podcast on fungi, which has some humor, but also great science.

http://www.radiolab.org/story/from-tree-to-shining-tree/

Lastly check out our resources page with some of my favorite soil books.

http://serranocreeksoils.com/additional_technical_resources.html