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**The Myth of Compost Tea, Episode III:  
"Aerobically-brewed compost tea suppresses disease"**

**The Myth**

No *Myth* topic has generated more interest, or controversy, than the purported ability of compost teas to suppress disease. With few exceptions, the popular and gray literature extols the virtues of aerated compost teas (ACTs). Literature for the gardening public uses phrases such as "lush foliage", "beautiful blooms", "delicious fruits and vegetables", and "thick green turf" to describe the effect of compost tea on particular plants. More broadly, usage of ACT promises to "improve all soils", "provide beneficial organisms", and "keep garden plants, turf, and crops free of disease". Environmental benefits are guaranteed too: ACT "reduces dependence on chemicals" and "reduces fertilizer use and leaching into ground water". An industry article reports "several studies have successfully controlled plant diseases and increased plant growth with compost teas" (though no evidence was presented to support this claim).

First mentioned in this column in April 2001, compost teas were last reviewed in August 2003 (both of these columns are available on this web site and will not be reviewed here). In that same time, Google hits have increased from 1900 to 4000 to nearly 13,000 on dot-com sites alone. An article in the trade magazine *Biocycle* states that the compost tea industry is growing at an estimated 25% per year. Obviously, the marketing of compost tea for disease suppression has become a bigger business in the last two years. Has the science behind the practice grown as well?

**The Reality**

Two recent literature reviews (Litterick et al., 2004 and Scheuerell & Mahaffee, 2002) on the role of compost tea in disease control report that non-aerated compost tea (NCT) can be effective in reducing some foliar pathogens in laboratory, greenhouse and field studies (which is in agreement with my August 2003 column). NCTs require no special equipment and cost virtually nothing to produce. In contrast, there are very few published studies on ACT efficacy. This doesn't mean ACTs aren't being researched, however. In addition to the articles cited in the two review papers, the web contains a number of research reports from university scientists recently or currently involved in ACT research. Briefly, here is a summary of their results (2003-2005):

<b>Crop</b>	<b>Disease</b>	<b>ACT Effective?</b>	<b>Institution</b>
<b>Tomato</b>	<b>Septoria</b>	<b>No</b>	<b>Cornell University</b>
	<b>Powdery mildew</b>	<b>No</b>	
	<b>Bacterial speck</b>	<b>No</b>	
<b>Tomato</b>	<b>Septoria</b>	<b>No</b>	<b>Iowa State University</b>
	<b>Powdery mildew</b>	<b>No</b>	
<b>Pumpkin</b>	<b>Powdery mildew</b>	<b>No</b>	<b>Cornell University</b>
	<b>Bacterial wilt</b>	<b>No</b>	
	<b>Downy mildew</b>	<b>No</b>	
<b>Squash</b>	<b>Powdery mildew</b>	<b>No</b>	<b>Ohio State University</b>
<b>Rose</b>	<b>Black spot</b>	<b>No</b>	<b>University of Minnesota</b>
	<b>Powdery mildew</b>	<b>No</b>	

<b>Apples</b>	<b>Apple scab</b>	<b>No</b>	<b>Michigan State University</b>
<b>Wine grapes</b>	<b>Phomopsis</b>	<b>No</b>	<b>Cornell University</b>
	<b>Downy mildew</b>	<b>No</b>	
	<b>Black rot</b>	<b>No</b>	
	<b>Potato leafhopper</b>	<b>No</b>	
	<b>European red mite</b>	<b>No</b>	
<b>Wine grapes (greenhouse)</b>	<b>Powdery mildew</b>	<b>Some</b>	<b>Penn State</b>
	<b>Botrytis</b>	<b>Some</b>	
<b>Wine grapes (field)</b>	<b>Powdery mildew</b>	<b>No</b>	<b>Penn State</b>
<b>Turf grass</b>	<b>Brown patch</b>	<b>No</b>	<b>Rutgers University</b>

(An additional focus of published compost tea research is the discovery of human pathogens, such as *E. coli*, in some ACTs. Though discussion of the topic is beyond the scope of this column, fecal contamination of compost teas is a health issue of serious concern to the EPA and other agencies.)

This represents the current state of university science behind the efficacy of aerated compost tea in disease control. Will these results be published in the peer-reviewed scientific literature? One hopes so, but the reality is that many scientists don't publish "negative" results and instead move on to other more promising areas of research. This is unfortunate as the science behind compost tea is very young and requires, as all researchers agree, substantial research before the hypothesis of disease control can be supported.

What do compost tea producers say about these negative results? Often, there is criticism of tea microbial content, the tea brewing process, the application process, weather conditions, other environmental stresses, etc. – in other words, the fault is not with the product. However, the overwhelming lack of positive results in university ACT studies suggests that the hypothesis might be in error and need to be revised. And even if the criticisms were justified, then how realistic can such a technology be for the typical home- or business owner who wants to make and apply their own compost tea?

This is the real problem I see in the world of compost tea, which is the selling of a product whose use is based on faith rather than science. As one proponent states, "There is no doubt in my mind that compost tea has already proven to be beneficial to agriculture." Individuals with this mind-set are not open to having their beliefs challenged by scientists or anyone else. However, buying expensive "tea brewers", purchasing ready made "tea" at several dollars a gallon, or paying a company to apply ACT in the absence of objective data sounds like snake oil rather than science.

There are thousands of web sites with glowing anecdotal praise for compost tea used as a foliar spray. What seems to be missing are stories from the other side – from those business and home owners who haven't seen differences in disease control or have even noted increased incidence and severity of disease. In the interest of a fair and balanced discussion, I am developing a web page for reporting these anecdotes as they are submitted to me. Feel free to send them in – you can remain anonymous if you wish.

There is no scientific evidence for ACT disease control on turf or landscape materials. Since ACT is not registered by the EPA as a pesticide, it is illegal to recommend its use as one, or to apply it as such to another person's landscape. Though some commercial sites disclose this regulatory fact, they also coyly include anecdotal information extolling the disease-suppressing properties of their product. Laundering product information to get around federal pesticide regulations is unethical. Misrepresentation of the science behind compost tea represents, at best, landscape management decisions based on faith rather than science. At worst, it suggests corporate profits at the expense of well-meaning but gullible consumers.

## **The Bottom Line**

- Aerated compost tea use for disease control continues to lack scientific credentials
- There is no documented science supporting the use of ACT on turf and landscape materials
- ACT is not registered as a pesticide and cannot legally be recommended or applied as one
- ACTs have been demonstrated to harbor human pathogens, including *E. coli*
- There is a rapidly growing, compost tea industry that continues to downplay the lack of reputable science behind the product
- Uses of products or processes for landscape management should be based on objective plant and soil science, not blind faith or commercial gain

Litterick, A.M., L. Harrier, P. Wallace, C.A. Watson and M. Wood. 2004. The role of uncomposted materials, composts, manures, and compost extracts in reducing pest and disease incidence and severity in sustainable temperate agricultural and horticultural crop production – a review. *Critical Reviews in Plant Science*, 23(6):453-479.

Scheuerell, S. and W. Mahaffee. 2002. Compost tea: principles and prospects for plant disease control. *Compost Science and Utilization*, 10(4): 313-338.

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