



STATE OF WASHINGTON

## DEPARTMENT OF AGRICULTURE

P.O. Box 42560 • Olympia, Washington 98504-2560 • (360) 902-1800

### **Compost Tea and Food Safety Andy Bary and David Granatstein Washington State University**

**Key Message:** Compost teas can contain elevated levels of human pathogens and pose a food safety risk, especially those produced with added sugar (e.g. molasses).

Growers in Washington State are showing increased interest in the use of compost tea as a crop production aid, particularly for the suppression of foliar and soil borne pathogens. This is especially true for the growing number of organic producers who may have few viable disease control options.

Compost tea can be defined as a watery extract of compost produced through a deliberate process. The goal is to enhance populations of beneficial microbes that can then exert a biological control over pathogens. Researchers have studied compost tea for over 20 years, particularly in Europe, and have demonstrated that effective disease control mechanisms exist, including control of *Alternaria*, *Botrytis*, *Sphaerotheca*, and *Phytophthora*. However, the tremendous variability in results achieved in the field limits the usefulness of compost tea. Factors affecting compost tea performance include type of compost, extraction process, target crop and pathogen, environmental conditions, and method of application, making it difficult to conduct rigorous research to improve performance.

There are several different methods used for making compost teas, those where tea is aerated during the production of the tea, and where no aeration is used and compost is just passively steeped with little agitation. Sugar materials and other additives may be added to promote microbial growth. The length of brewing time also varies in the different production methods. Recent research has helped understand whether these techniques are effective (Scheuerell). A major unanswered question is whether compost tea poses a food safety risk when used on crops that will not be cooked before eating.

One school of thought promotes the use of aerated compost tea with sugar additives to eliminate human pathogens in the tea. Recent studies (Duffy and Bess) documented exponential growth of human pathogens (*Salmonella* and *E. coli*) in sugar-amended tea, even when initial pathogen levels were extremely low. Tea without sugar did not show the pathogen increase. European researchers have demonstrated high microbial populations without pathogens using production methods without added sugar, (W. Brinton, personal communication). Ultimately, you want to increase the numbers of “good” microbes without increasing the numbers of pathogens that could potentially harm your customer.

The concern about pathogens in compost has generally focused on composts made from animal manures. However, a recent study (W. Brinton, pers. comm.) comparing composts in the Northeast (mostly dairy manure based) with composts in the Northwest

(mostly yard debris based) found that the dairy manure composts generally had much lower pathogen counts than the yard debris composts. Thus, concern for pathogens in compost tea applies to all composts, since tea making is a microbial enrichment process, and pathogens are likely to be found on most composts made in a non-sterile environment.

Another potential concern when using teas is how long human pathogens live on plant leaves and other harvested plant parts. Knowing this would affect how long of an interval teas need to be applied before the plant is harvested for human consumption. No such intervals have been established. One study on strawberry leaves had surviving *Salmonella* and *E. coli* 5 days after compost tea application. More research is needed to determine appropriate pre-harvest interval for compost tea applications for various crops.

The use of compost tea in crop production is still an emerging area of interest to the crop production community. Please use care in how compost teas are used. Think about how, when, and why you are using compost tea in relation to consumer food safety. Consider avoiding the addition of sugars during the tea brewing process for teas to be applied to fresh produce crops. Make sure you remind the public that all fresh produce needs to be washed before it is consumed.

#### References and additional reading

Bess, V. H., M. Manes, B. S. Richter, and J. L. Snodgrass. 2002. *E. coli* survival in compost tea using different nutrient substances. International Symposium: Composting and Compost Utilization: May 6, 7, 8, 2002, Columbus, Ohio, USA, Adam's Mark Hotel.

Duffy, Brion, C. Sarreal, R. Stevenson, S. Ravva and L. Stanker. 2002. Regrowth of pathogenic bacteria in compost teas and risk of transmission to strawberry plants. International Symposium: Composting and Compost Utilization: May 6, 7, 8, 2002, Columbus, Ohio, USA, Adam's Mark Hotel.

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

Scheuerell, S. 2002. Compost teas and compost amended container media for disease control. Ph.D diss. Oregon State University, Corvallis.

<http://attra.ncat.org/attra-pub/compost-tea-notes.html>

<http://attra.ncat.org/attra-pub/compostteashow/compost-tea-slides/tsld001.htm>