

Compost Tea - Chris Alenson Jun '15

What is compost tea?

Compost and Compost teas have been used for centuries. Compost teas are basically animal and plant wastes which have been placed in a permeable bag in a container full of water until the water turns black. More recently technology has used the brewing process where additional microbial food sources have been added to the solution in which a pump aerates the solution ensuring an adequate supply of oxygen. These additives may include molasses, seaweed, fish emulsion/hydrolysate, humic acid and rock dusts. The objective of this aerobic compost tea process is to grow populations of beneficial microorganisms.



Over many years gardening books have made reference to compost teas, compost leachates and manure teas. The difference is explained below:

Compost leachate - This is the brown to dark brown extract which leaches out of the bottom of the heap during the composting process and owes its colour to dissolved particulate organic matter. It may also contain soluble minerals, organic colloids attached to the solids and possibly pathogens. (Christenson, 1983).

Compost Extract or manure tea - This is where compost, manure or weeds or a mixture are suspended in a porous bag in a tub of water and the resultant dark coloured extract is again diluted and used as a plant stimulant.

Compost tea

As explained above compost tea is derived as a result of a controlled brewing process where selected additives further enhance the microbial status of the tea.

Warning - Compost leachates and compost teas made from animal/poultry manures should not be used on vegetables that are consumed without cooking due to the risk of E- Coli contamination.



Potential benefits of compost tea

The following benefits are accredited to the use of a compost tea containing a wide spread of food web organisms (Pant, Radovich, Hue and Arancon, 2011).

- Protection of the plant from disease thus improving plant growth
- Increased nutrient supply to plant roots
- Compost tea increases the diversity of organisms around the plant rhizosphere
- Increased microorganisms activity improves soil structure
- Increased production
- Increase in some nutritional components

Making Compost tea

It is emphasised that if you want the end product of the process to contain a wide range of bacteria, fungi, protozoa and nematodes then high quality compost should be used in the initial leaching process. The compost is generally placed in a bag that will retain the compost particulate material but still allow the beneficial microbes including fungi and nematodes to pass into the solution.

The actual brewing process although seemingly simple can result in a compost tea devoid of nutrients and microbial life if brewing conditions are not strictly adhered to. The microbial rich final product will depend on:

- a high quality compost used in the leaching process
- the correct container being used for the process (must be extremely clean)



- an adequate supply of oxygen supplied through the pumping system
- the microbial foods added to the brew
- the correct temperature during the process
- the length of time for the brewing process

The variability seen in the results of field applications of the compost tea may be a reflection of an inadequate brewing process, environmental conditions and/or the method of application.

Previous investigators have stressed the fact that compost brewing is not straight forward and that the tea should be checked for biology by a recognised laboratory before use to ensure the correct balance of fungi and bacteria.

Note: Compost tea recipes and instructions on the brewing process can be sourced from the references at the end of these notes. It is also suggested that contact with AgPath laboratories might be worthwhile as analysis of the brew is strongly recommended.

Application of Compost tea

Continued aeration will prolong the life of the compost tea but the microbial life will run out of food relatively quickly and decline in quantity. It is best to apply the tea within 4-6 hours of removal from the brewing container. Foliar applications are best performed early in the morning or later in the day. When diluting your compost use de-chlorinated water which will not kill beneficial microbes.

Use of Compost Tea

There appear to be two main uses of compost tea:

1. Applying a microbial boost to the soil thus stimulating further biological activity
2. Applying the tea to plant leaf surfaces as a disease suppressant

What has research demonstrated about the use of compost tea?

Both open field and greenhouse plant trials have demonstrated the benefits of using compost tea. Germination and productivity increases have been seen across a range of horticultural crops. Researchers over a twenty year period have also demonstrated that effective disease control mechanisms exist including control of *Alternaria*, *Botrytis*, *Sphaerotheca*, *Pythium* and *Phytophthora* (Scheurell & Mahaffee, 2006).

Compost tea also suppressed population of plant roots nematode parasite, spider mite and aphids significantly. Enhancement in soil structure has been seen in some trials.



It should be mentioned that although there are many positive results reported, there is great variability in many trials reporting on productivity, crop and soil health. This may have more to do with the production and application of the compost tea itself rather than a failure at trial stage.

Pathogens and compost tea

The potential for contamination of teas by human pathogens has been investigated particularly where the use of molasses has lead to an increase in organisms such as *E. Coli* and salmonella. However it is emphasised that if the compost has reached temperatures above 55 degrees C the risk of contamination by these pathogens is greatly reduced.

Conclusion

It appears from quite substantial research that compost tea results are mixed in terms of increases in production of plant growth and modification of plant disease. A number of trials report positive trial outcomes, equally a number of trials do not report positive effects. Perhaps the biggest issue facing the use of compost tea is although it is relatively cheap in terms of its



application to broad acreage it is very difficult to get the brew right in terms of its microbial content from the time of brewing through to the time of application.

Compost teas should be considered an adjunct to sound on-farm management strategies which might include the use of green manure crops, compost, incorporation of stubble, management of pH and essential plant nutrients and optimisation of the soils physical characteristics.

References

1. Soil Biology Testing http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0018/41643/Soil_biology_testing.pdf
2. Pant, A., Radovich, T.J.K., Hue, N.V., and Arancon, N. Q. 2011, Effect of Vermicompost tea (aqueous extract) on Pak Coi Yield, Quality and on Soil Biological Properties, Compost Science & Utilisation, Vol. 19, No. 4. 279-0292 http://www.ctahr.hawaii.edu/huen/archana_paper.pdf
3. Arancon, N. Q. Edwards, C.A. Dick, R, Dick, L. 2007, Vermicompost Tea Production and Plant Growth Impacts, Biocycle, Nov. <http://betuco.be/compost/Vermicompost%20tea%20production.pdf>
4. Gotha, A.R. Ayesgbag, V. 2015, Vermicompost tea and its role in control of pest: A Review, Int. J. Of Research in Biological Sciences, 2(3), 111-113 <http://www.ijarbs.com/pdfcopy/mar2015/ijarbs17.pdf>
5. Macquarie Franklin, June 2013, Compost and compost tea trial at Patterdale, Tasmania – final report <http://www.nrmnorth.org.au/client-assets/documents/reports/nrm/Compost%20and%20Compost%20Tea%20Trial.pdf>
6. 2003, Evaluating the Benefits of Compost Teas to the Small Market Grower, Greenbrook, Energy and Sustainable Agriculture Program, Minnesota Department of Agriculture <https://www.mda.state.mn.us/news/publications/protecting/sustainable/greenbook2001/2001gb30.pdf>
7. Dr. Linda Chalker-Scott, Compost Tea: Examining the science behind the claims http://puyallup.wsu.edu/~linda%20chalker-scott/Horticultural%20Myths_files/Myths/Compost%20tea%204.pdf
8. Scheurell, S.J. & Mahaffee, W.F. 2006, Variability Associated with Suppression of Gray Mould (*Botrytis cinerea*) on Geranium by Foliar Applications of Non Aerated and Aerated Compost Teas, Vol. 90, No. 9, September <http://apsjournals.apsnet.org/doi/abs/10.1094/PD-90-1201>

Other references

1. *Bio Ag Compost Tea Recipe* www.bioag.com/images/BioAg_Compost_Tea_Recipe.pdf
2. Compost tea production practices, microbial properties, and plant disease suppression www.soilace.com/pdf/pon2004/5.Scheuerell.pdf
3. Compost Tea and Food Safety <http://digitalarchives.wa.gov/WA.Media/do/46F3C4D6781A47E69EEFB5D59D224DB3.pdf>
4. Compost tea brewing manual (Soil Food Web) http://ecologiesurleweb.free.fr/docs/Docs_agir/Lombricomposteur/Brew%20Manual%20compost%20tea.pdf
5. Hastings Landcare, 2010, NRCMA Case Study: Simplifying Compost Tea Application <http://www.hastingslandcare.org.au/projects/compost-tea>

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