

# The Production and Use of Compost Tea Xtract for Improved Plant Growth<sup>®</sup>

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I work for Rhizopon BV, a Dutch company that has produced plant rooting hormone since 1940. I have been a consultant for almost 30 years giving advise based upon field research..

## INTRODUCTION

Growers are well aware that rooting hormones influence root formation when propagating plants from cuttings. Over the years we confirmed that healthy mother plants produce cuttings that rapidly produce quality roots. Among the questions that arose during my early research was, what makes the best cutting to use for plant propagation? My answer came in the past 20 years of testing. 2010 is called the “YEAR OF BIODIVER SITY.” My conclusion is, “biodiversity” produces the best cuttings.

High microbial diversity in the rhizosphere and on the leaves of plants provides protection and optimal nourishment. These are critical parameters for high quality mother plants. The resulting cuttings have a population of diversity dynamics.

In 1998 I started research on the use of compost tea. The primary reason for this research has been to vitalize the plant’s above- and below-ground environment.

My research was focused on:

- Rhizosphere enrichment of bare soil.
- Substrates such as peat and coir but also rockwool.
- Phylosphere enrichment through foliar application.
- Decomposing fallen leaves.
- Soil structure improvement.
- Support of the natural disease suppression systems of plants.
- Organically bound nutrients and root development in cuttings.



**Figure 1.** Philosphere of a tree in the tropics. Covered with plants and trillions of different microorganisms.

**Controlled Microbial Composting.** Dr. Ehrendfried Pfeiffer (Fig. 2) developed controlled microbial composting (CMC) in the early part of the last century. The method allows growers to produce valuable humified compost from organic residues. Extracts made from CMC compost provide growers with option to restore and maintain microorganisms anywhere they need them.



**Figure 2.** Dr. Ehrendfried Pfeiffer (from the Collection of Threefold Educational Center).

These extracts produce high yields and quality plants. I found that especially seedlings and rooted cuttings, treated with compost teas, and organic nutrients, are better than those treated with synthetic fertilizer compounds.

### COMPOST XTRACTOR®

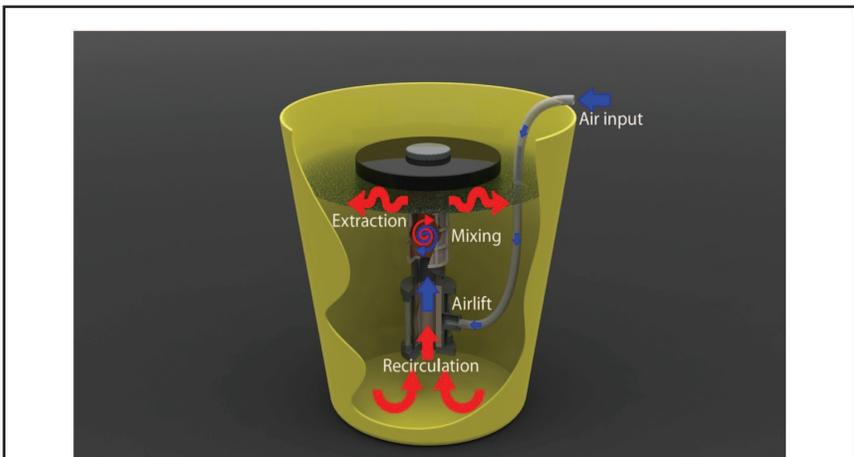
Compost and compost tea improve soil characteristics, and they can even vitalize an inert substrate. In the 1990s compost tea use was rediscovered in North America. Compost teas are water-based extracts of good quality compost. Organisms are removed from their

humus structure and are hosted in the liquid. The tea's microorganism population can be applied through conventional irrigation and sprinkler systems. Bob Baars, an organic plant researcher and worldwide renowned consultant, developed a compost tea extraction method for optimum plants use.

The equipment is called the Compost Xtractor®.

There is a distinction between brewing and extracting compost in water. In compost tea brewing systems, 50 gal are made from 20 lbs of compost (200 L are made from 10 kg of compost) in 18 to 24 h.

The Compost Xtractor however extracts 50 gal of compost extract and it uses only 2 lbs of compost (200 L with 1 kg of compost) in just 8 h. In the Xtractor compost is

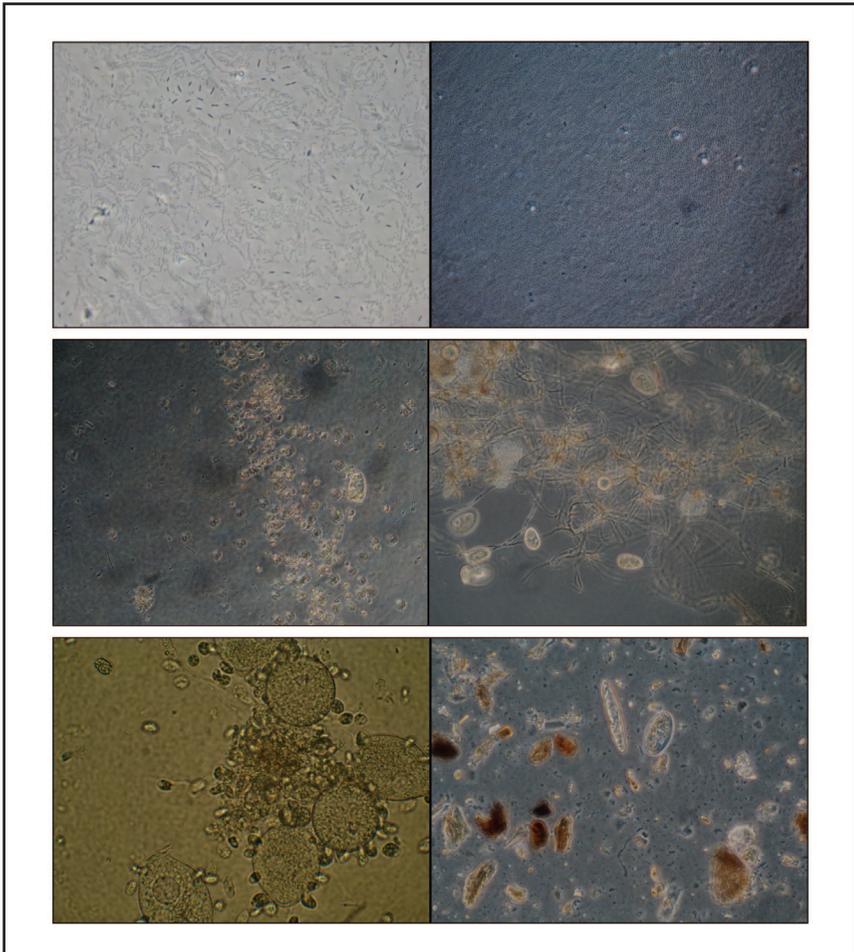


**Figure 3.** Compost extraction machine XTRACTOR. Figure copyrighted by Alexander Eigenraam®.

put together with special nutrients into a filter tube. Fine air bubble diffusion and airlift principles remove most organisms and their spores from the compost (Fig. 4). Many organisms in the compost extract come in spore form. They are activated in the soil or substrate. The plant is actively involved and regulates this. The shelf life of what we call an Xtract, is up to 7 days.

### APPLICATION OF COMPOST XTRACTS

Compost Xtract is applied and dosed with venturi Dosatron mixers or low pressure injection systems. It may also be applied through the water supply system, irrigation, drip irrigation, mini sprinklers, ebb and flood irrigation systems, capillary mats, pure fogging systems, pure low-volume mist, or backpack fogging machines.



**Figure 4.** Compost Xtract organisms: top left *Bacillus* active and spores; top right spores of different organisms; left middle; protozoas; right middle: protozoa and fungi; bottom left: protozoa different sp.; bottom right protozoa, bacteria, and spores. Magnification: 600X Bob Baars®.

Some of the crops that are candidates to use compost Xtract on are:

- Seedlings and cuttings (Fig. 5).
- Horticultural crops such as bedding plants, cut flowers including roses, mums and orchids.
- Agricultural crops such as arable crops, orchards, viticulture.
- Field crops such as strawberries, vegetable gardens, and vegetables under glass in soil and in substrate.
- Many uses on turf and golf courses, public gardens and parks, tree nurseries.



**Figure 5.** Chrysanthemum cuttings (left) only water spray (right) after sticking treated with compost Xtract after 10 days from treatment. Pre-treated with RHIZOPON #2 powder. FN-los means a coir substrate named: Fiber Net.

## DISCUSSION

**Human Digestive System.** There is a similarity between plant growth regulation and the human digestive system. Human health is largely determined by the functioning of our digestive system. That system is controlled by industrious microorganisms in our intestines. The foods we eat are the building blocks for the billions of microbes that live there. These microorganisms produce the nourishing substances that we need to develop and maintain a healthy body. To perform optimally, the system needs healthy organic food with high-energy and nutritional value.

The microbes communicate with human body functions, thus insuring that the digestive system properly maintains our bodies and our immune system. When we eat industrially refined products, the digestive system does not function to its full potential. When the digestive population does not receive adequately nourishing building blocks it may lead to their decline. That in turn may be the cause for life-threatening situations.

Some specialized digestive organisms cannot extract food from refined products or produce secondary metabolites. To feel good, people compensate for lack of metabolites by replacing organic food with synthetic substances, such as man-made vitamins and products of questionable value.

**The Soil as a Digestive Organ for Plants.** Nature in general and agriculture in particular are no different from the above example. In nature the digestive system is the soil or cultivation substrate. We might think of the “soil” as the “stomach” of the plant. We ought to feed the soil microorganisms so that they in turn nourish and stimulate the plants. The task of microorganisms is to release and transport minerals from the soil, as well as regulating the natural disease suppressive system.

In and on the plant and in the soil there's a fine-tuned symbiotic communication system that acts between the plant and the microorganisms. Plants produce assimilates that are used by microorganisms to grow and multiply. During the process of growth and multiplication, the microorganisms in return supply nutrients and minerals that are needed for plant growth and flower and fruit production.

If we only supply our plants with refined nutrients such as fertilizer, than an important part of the diversity of microorganisms in the soil or the substrate is redundant. Artificial fertilizer substance, mostly salts, causes microorganisms to go to sleep or even die.

The result is that multiple types of microorganisms stop producing vital nutrients and minerals. Lacking those substances, the plant may weaken or even die of malnutrition.

Plants therefore prefer absorbing organically bound nutrients, mostly sugars.

Organic nutrient binding is an exclusive job of microorganisms.

Nutrient leaching is non-existent when microbial life is healthy and active in the soil or substrate. Water- and nutrient-holding capacity in soils and substrates is greatly improved when microorganisms are present and active. Soil structure and diffusion of gasses is also an activity of microorganisms, as is the natural disease suppression of pathogens.

## CONCLUSION

To develop the highest quality, plants must be able to adequately use nutrients. Application of compost teas that contain a large diversity of microorganisms help the roots to extract organic nutrients from the rhizosphere. Refined nutrients do not provide adequate stimuli.

Young plants, such as seedlings and root developing cuttings, are very sensitive for artificial fertilizer (salts) and develop much easier and better with organically bound nutrients (sugars).

Especially in mother plant, “stock plant,” and young plant culture, I recommend the application of compost extract instead of commercial fertilizers.

Soil-borne micro-organisms are the greatest reservoirs of biodiversity on the planet and are known to be critical to terrestrial ecosystem functioning. However, our mechanistic understanding of microbial activities in soil and the genetic basis for these activities are still poor, hampering our ability to harness and manage this tremendous diversity.

**Acknowledgements.** Test centre; “De Kas” <[www.vanderknaap.info](http://www.vanderknaap.info)>; and Ron Schoutsen R&D Dekker Chrysanten <[www.dekkerchrysanten.nl](http://www.dekkerchrysanten.nl)>.

## REFERENCES AND WEBSITES ON COMPOST TEA

Bob Baars: Global Horticare <[www.composttea.nl](http://www.composttea.nl)>

Rhizopon: <[www.rhizopon.com](http://www.rhizopon.com)>

NASA: <<http://soil.gsfc.nasa.gov/index.html>>

USDA: <<http://urbanext.illinois.edu/soil/index.html>>

New Jersey Soil Health: <<http://www.njsoilhealth.org/>>

Nederlands Instituut voor Ecologie: <[www.nioo.knaw.nl](http://www.nioo.knaw.nl)>