

Compost Tea Ingredients

Dr Elaine Ingham with Mary's comments.

Compost Tea Ingredients and Biological Food Sources

Compost; your #1 ingredient

High quality compost, possessing a full diversity of biology, is the key to brewing quality compost teas. Different food sources and techniques used to produce the compost will offer differing results. For example, bacteria generally dominate vermicompost whereas fungi tend to be the primary organism in forest humus and mushroom compost.

Ensuring that proper biology is active or at a minimum present in your compost is necessary to achieve the desired results from brewing compost teas. Either purchase compost from a source willing to provide biological assessments of their product(s) or have your own compost tested. Testing your home-produced compost is a useful tool in assessing the life in your compost and the potential benefits of your compost teas. Biological assessments or working with your own microscope is the only means to ensure that the full diversity of biology is present in compost or compost teas.

- ***biological Testing Labs visit:*** www.agpath.com.au

Earthworm Castings/ Vermicompost:

Earthworm compost / Vermicompost contains a high percentage of earthworm cast or worm manure and significantly large populations of beneficial bacteria, enzymes and protozoa. Earthworm composts usually contain lower levels of active fungi yet should possess plenty of dormant fungi spores that can be encouraged by pre-treating the vermicompost with sources of food for fungi and allowing the compost to mature for 3 – 7 days prior to beginning your brewing cycle. (*More on pre-treating below*)

Forest Humus:

Harvested from deep forests floors and rich in diverse types of fungi. Forest humus is an excellent source of biology for use in fungal dominated compost tea blends.

Please careful where and what you are collecting in our Australian forests and whether it is allowed in the first place before you harvest.

Mushroom Compost:

Derived from the remnants of mushroom manufacturing and a source of more fungal dominant compost, yet not all mushroom composts are created the same. Some commercial mushroom growers sterilise their compost prior to reselling, ask for biological testing results or have mushroom composts tested.

You may find mushroom spent compost is organic matter with little nutrients left because most if not all have been used up in producing the commercial mushroom crop.

Pre-treating Compost to Balance or Increase Fungal Biomass;

For 5-gallon brewers:

- Place 2 – 4 cups of compost in a plastic container (for best results gather from different sources)
- Apply ¼ cup of organic oat flour or finely ground oatmeal across the compost and turn-under
- Mix the recommended liquid ingredients with ¼ cup of water
- Apply the mixture evenly to the surface of the compost
- Cover with a loose-fitting lid or moist cardboard and store in a cool dark place for 3 – 7 days

Pre-activation times can vary based upon the presence of active fungi, dormant spores, moisture and temperature. Under the right conditions you should see a white fuzz (fungi mycelium) begin to cover the surface of the compost within 3 – 7 days. This is an indicator of active fungi and will tell you that your compost is now ready for brewing into tea. Use this pre-treated compost in your Garden Tea Brewer.



How to Make Your Own Compost for use in Compost Tea

Composting with red worms is one of the easiest means of creating a high quality, compost. Under the ideal conditions this can be achieved in as little as 60 - 90 days.

Using 35% dry brown materials, 35% fresh green materials, and 30% manure can create a more biologically **balanced compost**.

Fungal-dominated compost can be made using 45% dry brown materials that should include wood chips, 30% fresh green materials, and 25% manures.

Building your compost heap:

- Create a 3” – 4” layer of materials
 - Apply a thin layer of steel cut oats
 - Water each layer with a good balanced compost tea
 - Repeat until your heap is 4’ x 4’ x 4’
 - Cover your heap with a large sheet of wet cardboard to shed excessive water
 - You may need to weigh-down the cardboard to keep it in place.
 - Turn compost heaps 2 – 3 times over a 3 month period or allow it to age 6 – 9 months
 - Turn one last time and then allow to mature for 3 weeks

Microbial Food Sources

Molasses, Sorghum, Honey, Maple Syrup, Cane Sugar

Simple sugars serve as an excellent bacterial food resource. All the sugars listed above also contain trace minerals, which will help to fortify teas with micronutrients. When using molasses be sure to use unsulfured molasses.

Our Australian molasses is generally low sulphur.

Kelp: Meal & Soluble Kelp Powders

On its own, kelp is an excellent fertiliser and biological stimulant containing growth hormones such as auxins, gibberellins and cytokinins, which are highly beneficial to plants and soils. When used in compost teas, kelp encourages growth of fungi and bacteria. Kelp is a naturally rich organic source of Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Magnesium (Mg), Sulfur (S). Kelp contains at least 60 trace minerals, over 12 vitamins, a variety of amino acids. Soluble seaweed powders are more concentrated and require lower quantities than kelp meals.

Make sure you use fish hydrolysate and not fish emulsion. Not all fish hydrolysates are equal either. Some are definitely better in compost teas than others.

Fish Hydrolysate:

Fish hydrolysate is a cold processed and enzyme digested liquid fish fertiliser made from all fish parts. Fish hydrolysate is used as a standalone protein-rich fertiliser and to stimulate both bacteria and fungi. Pre-treating compost with Fish hydrolysate will help increase the fungal biomass.

Humic Acids:

Humic acids are primarily found in manure, peat, lignite coal, and leonardite; a highly oxidised form of organic matter and the source for most humic acid products. Humic acids work great as a food source for all beneficial microorganisms in compost tea. Use to pre-treat compost and increase the fungal component in your tea. Humic acids have been shown to increase seed germination rates, aid in breaking up clay and compacted soils, support the transfer of micronutrients between soil and plant, and improve water retention within soils.

Grain Meals and Flours:

Oatmeal or oat flour is an excellent and cost-effective fungal food resource and can be added directly to compost tea. Fungi feed on the proteins and complex

carbohydrates using the fiber as a physical attachment point for fungal spores and hyphae. Though oatmeal and oat flours are preferred, other grain meals such as wheat, rye, or barley may be used.

Soft Rock Phosphate:

Soft Rock Phosphate is one of the best natural sources of phosphorus (P) and calcium (Ca). When applied to soils Colloidal Phosphate is immediately available to plants and will act as a long-term source of phosphorus. In compost tea soft rock phosphate is used as a fungal food source.

This is the very best phosphate to be applied into the agricultural system if P needs to be added.

Rock meals & Volcanic Rock/ Ash Powders;

Glacial Rock Powders and volcanic ash deposits such as AZOMITE[®] (a mined volcanic ash deposit) contain a broad spectrum of metabolically active minerals and trace elements. These concentrated mineral powders are used to fortify teas and ensuring the presence of micronutrients. These powders can also be used to re-mineralise soils or as a livestock nutrient supplement.

Quarry rock dust is available from most quarries in Australia. If dust alone is not available then ask for less than 6mm screened material and you will get plenty of dust. This material originates from the plasma of the earth's core and contains all the minerals with which life on Earth has evolved. An example near Agpath Labs, is Tynong toppings.

Lucerne/Alfalfa Meal:

Teas made from Lucerne meal serve as a standalone fertiliser. As an additive to compost tea, lucerne serves as food source for both bacteria and fungi. Lucerne is a good source of vitamins A and B; Folic acids, Amino acids, crude proteins, natural sugars and starches along with Nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulphur (S), Manganese (Mn), iron (Fe), copper (Cu), boron (B), and zinc (Zn). Lucerne Meal as an organic garden fertiliser has an approximate N-P-K analysis of 2-1-2.

Guano:

For centuries guano has been recognized for its outstanding effect on agricultural crops. Guano provides both macro and micronutrients along with active and dormant microorganisms to soils. Applications of Guano in dry forms or brewed in garden teas can provide an outstanding organic fertiliser without increasing salt content or acidity.

SEA-90

SEA-90 is 100% natural sea mineral solids containing 90 essential micronutrient elements. SEA-90 is the product of 30 years of research by Maynard Murray, MD who proved soils enhanced with sea minerals grow crops superior to that grown solely with conventional fertilizers. SEA-90 is a water soluble, mined sea mineral for use in organic food production and as a livestock feed supplement.

Many people use a cup full of fresh sea water in their compost or compost tea. This is useful if one is in driving distance of clean ocean.

Sea-90 is available in Australia from this Melbourne Distributor.

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Mycorrhizal Fungi

Mycorrhiza describes the mutually beneficial relationship between a plant and root fungus. More than 90 percent of plant species in nature form a symbiotic relationship with the beneficial mycorrhizal fungi. Mycorrhizae bond with the roots of a host plant and exchange valuable nutrients and minerals with one another. Mycorrhizal fungal filaments extend far into the soil and act as extensions of the root systems mining water, minerals and nutrients more efficiently than roots alone greatly expand a plants absorption capacity. **Add mycorrhizal fungi spores at the end of a brew cycle and prior to application (mycorrhizal fungi should be applied as a soil drench**

Insect Frass:

Insect Frass 2-2-2 is an organic fertiliser and soil amendment derived from the excrement of herbivore insects, providing high quality nutrition for plants and soils.

Insect Frass has the added benefit of acting as a natural bio-pesticide/ biological defense. Insect Frass contains high concentrations of Chitin (pronounced "Kite-in"). When plants sense chitin concentration in the vicinity, they respond as if they are being infested and eaten by insects. The presence of chitin triggers an "auto-immune" response in plants causing the plant to defend itself from pests and pathogens. Plants begin to protect itself by strengthening its cell walls, producing

more chute biomass (stalk and leaf material), and excreting secondary metabolites to ward off pests and pathogens. As a natural bio-pesticide chitin and chitosan has been recognised to help defend plants against botrytis (grey mold), powdery mildew, early and late blight, fungal pathogens in the root zone (root rot) and root-feeding nematodes.

Chitin is a naturally occurring molecule (Poly-N-acetyl-D-glucosamine). Structurally, chitin is related to cellulose, which consists of long chains of glucose molecules linked to each other. Chitin is present in the shells of all crustaceans and insects, and in many fungi, algae, and yeast.