



Characterization of compost tea and bio-slurry as plant biostimulants

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DESCRIPTION

Population growth and the resulting increase in food consumption in recent decades have led to an overuse of synthetic agrochemicals. Although the yield of certain crops may increase temporarily, the high toxicity, mobility, and low biodegradability of these products lead to a variety of environmental issues. Heavy fertilizer use has had a negative impact on the environment, causing soil and water contamination as well as releasing gases that heighten the greenhouse effect.

Due to this circumstance, it is now necessary to think about more environmentally friendly production methods that nevertheless provide high-quality food. As a result, it's essential to create and use alternatives that have minimal negative effects on agriculture. Bio-products are leftovers from biological processes that contain nutrients and advantageous bacteria that aid in the growth of plants.

Bio-products are typically made from organic wastes by utilizing the nutrients and helpful microbes that are present, while the residues are handled and minimized. Composting is an approach that enables the relatively safe treatment of a large volume of organic waste while generating a high-value product. It is an aerobic biological process that converts organic resources into a homogenous product that plants may absorb.

Compost teas, which are filtered suspensions of compost in water, have the ability to extract soluble nutrients and beneficial bacteria for use as bio pesticides or plant fertilizers. There are two basic methods for getting it: aerated and non-aerated.

The first one typically results in shorter elaboration times, but it also necessitates the use of aerators and the available energy sources, whereas the non-aerated option requires no energy or equipment but may result in longer elaboration times. No trustworthy evidence has been produced to substantiate the claims that non-aerated compost tea is phytotoxic and encourages the growth of pathogens. The bio slurry is another promising liquid bio-product; unlike compost tea, it is created from fresh material without any prior processing, such as composting, and it is primarily an anaerobic process. In general, research on this bio product has shown that the liquid portion of the bio digest state, which is a byproduct of the production of biogas, can be used as fertilizer, a pest controller, and even in bioremediation.

CONCLUSION

In order to especially promote plant nutrition and growth, The Food and Agriculture Organization (FAO) has established a procedure for the formulation of bio slurry using fresh material (such as vegetable residues, animal dung, ashes, and bone meals). This methodology disregards the production of biogas. No researches examining its qualities were identified, despite the fact that most focus is on the methanogenic process effluent, despite the product's low cost and high potential. However, because the transformation process is carried out by the microorganisms present in the raw material or by inoculation, it is important to keep in mind that these product properties are highly dependent on the material raw, elaboration process, and conservation conditions.

As a result, the effect of all these variables is largely unknown. However, one of the biggest problems for producers is the excessive reliance on these items and the high cost of substrates and fertilizers. The features of Sphagnum moss peat, for instance, allow for appropriate germination and seedling growth, but because of the high cost and unsustainable production, its usage has begun to be constrained. Blends of compost teas compared to beverages made from a single source, compost offers greater nutritious value. Plant biomass did not significantly change across compost tea brewing techniques (aerated and non-aerated). To reduce the saltiness of tea, precautions must be taken.

This can be done by diluting the tea or using less water when boiling the compost. Diluted compost teas should be investigated as bio fertilizers, and their ability to control fungus-related plant diseases should also be assessed. It seems more practical to use diluted bio slurry as a bio fertilizer to promote plant growth in containers. An appropriate substrate for the growth of floral plants could be compost.