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Nourishment of Plants with Tea Leaves as a Growth Inducer

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ABSTRACT

Tea extract which is rich in nutrients and minerals can be mixed with the soil as a nourishment for plants. Compared to compost which requires decomposition, these tea extract is a direct source of nutrients to plants. Tea extract can be a good nutrient adjuvant, especially when number of plants are less and are grown in pots. In this research 12 healthy rose plants were take. In that 6 plants were planted in one pot and was fertilised without tea extract and other 6 plants were planted and fertilised with tea extract and the growth was observed. It was observed that the rose plants nourished with added tea extracts showed an increase in growth rate compared to the other plants. From this research it is evident that tea leaves contains vital ingredients for the nourishment of plants.

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INTRODUCTION

Tea leaves are found to enrich nutrients to plants which are grown in pots. (Aro *et al.*, 1995). The compost concentrates the micro and macro nutrients and beneficial bacteria in liquid form, for the plants root to absorb more easily (Aoseer Buber *et al.*, 1995). They also help to prevent disease which are soil borne and provide leaves of plant with protective coating (Chen, Hu, 2000). Food waste is increasing day by day owing to the increased population and affordability. If an alternative way is explored to reuse the waste, we can reduce the amount of food waste and save our planet. Throughout the world, beverages like coffee and tea has taken an important part of our diet (Conor Reilly, 1998). Once the extract has been

taken for the beverage preparation, the used coffee or tea is thrown out. Even after the extraction the coffee and tea remains still has a lot of nutrients in it. Thus, these used coffee and tea powder can be used to nourish the soil. Tea grounds can be used as a fertiliser as it helps to improve the plant's growth, overall health and vigour (Diaz-Alarcon, 1994). Tea grounds may not be able to act as a complete growth inducer for all the plants. There are certain varieties of plants which respond to this addition. (Du Qizhen, 1991). Tea grounds are rich in tannic acid. Upon addition of water, tannic acid present in the tea grounds, enter in to the soil. Tannic acid lowers the pH of soil, as a result increases the acidity (FDA, 1987). Thus the plants which requires an acidic condition to grow, thrive well with tea grounds as a fertilizer, but plants which requires alkaline medium cannot grow well if tea grounds are added. (Foster and Sumar, 1997). Thus fresh and used tea grounds can be added only to acid-loving plants like rose bushes and ferns (Ge, Yang, 1993).

Some of the top benefits of adding fresh tea grounds as a soil nourisher are listed (Gupta and Gupta, 2000). It was evident that continuous addition of tea grounds improved the quality of leaves and the size and yield of vegetables and the number of flowers. (Johanna and Kishorchanra, 1987). Tea grounds improves the quality of plant

Table 1: Effect of tea extract on soil

SOIL TYPE	Day 1	Week 1	Week 2	Week 3	Week 4
Soil without tea extract	14.4 ± 0.8	14.7 ± 1.2	15.3 ± 1.0	15.7 ± 0.6	16.1 ± 0.8
Soil with tea extract	14.5 ± 0.5	14.8 ± 1.3	15.5 ± 1.1	16.1 ± 0.88	16.6 ± 0.9
Significance	—	P<0.05	P<0.05	P< 0.005	P<0.001

by increasing the growth of root system, thereby helping the plants to absorb the nutrients from ground and also helps in the multiplication of beneficial bacteria that enhances the immune system of plants (Levander, 1987). Tea grounds can be a natural alternative to harsh chemical composts that cause harm to native plants, insects, wildlife, and even humans (Mahan, Kim, 1996). Making use of the right alternative for the synthetic fertilizer from household waste is the need of the hour (Mejuto-Marti *et al.*, 1988). Even among the kitchen waste, when tea grounds can be used with an ease when compared with vegetable or fruit waste. Other food waste like vegetable or fruit waste need to be made in to a compost, which requires labour and time. As in the case of tea grounds, it can be directly mixed with soil. It need not be made in to a compost. Qihui Hu and Genxing Pan, 1999). Thus for the small number of plants, as we have it in a home garden, tea grounds can be easily added to make the garden blush with vibrant leaves (Qihui Hu *et al.*, 1999). The quality of the sand is not always the same. Usually sand is made of silica and it is the presence of nutrients which enriches the soil making it a enhancer and supporter of plants. (Qihui Hu, 2001). In order for sand to be viable for a potting soil, it must be conditioned by adding the necessary ingredients, and tea leaves are an excellent way to do that (Ravikumar, 2014). Tea leaves will mix easily into sand, and the difference is immediately visible, as bits of tea leaf can be seen distributed throughout the grains of sand (Jayakeertha, 2016). Tea leaves mixed with sand have another benefit, that being the ability to hold the soil together, preventing moisture from draining straight through the grains of sand.

MATERIALS AND METHODS

For this research total 12 rose plants were taken into consideration. In that 6 plants were planted in one pot and was fertilised without tea extract and other 6 plants were planted and fertilised with tea extract and the growth was observed. 500gm of the tea leaf extract was mixed well and then the plants were planted. Tea leaf extract was added in intervals. The two pots with rose plants are kept in such a way that it receives ambient sun light and care was taken to water these plants regularly. The growth rate of these plants was monitored in a regular interval for four weeks. The average height

for each group of rose plants is obtained by totalling the height and dividing by 6.

RESULTS AND DISCUSSION

Rose plants planted in soil containing tea leaf extract in figure 2, grow more quickly than the plants grown without tea leaf extract figure 1. The results showed that plants which were planted in the soil mixed with the tea extract, grow significantly faster rate over the 4 weeks, in all the weeks there is a 4th week there is highly significant increase in the growth height of the plant with tea extract compared with plant without tea extract.



Figure 1: Growth of rose plant without tea extract



Figure 2: Growth of rose plant with tea extract

Tea grounds are a routine waste any household would produce. Tea grounds are rich in antioxidants such as catechin and also contains nitrogen and tannin. As it can be directly mixed with ground with any compost production, these antioxidants and nitrogen can be naturally made available for the plants in the garden. Nutrient rich tea grounds can be mixed with compost or fertilizers and used. When planting rose plant tea grounds can be used as a soil additive. Tea leaves can also be removed from bags or infusers, laid

atop the soil around roses and scratched in with a garden fork.

Used tea grounds and the fresh tea leaves contains nutrients and tannic acid thus, when it is added to the soil, it creates the more fertile environment for garden, landscape and container plants. Because tea grounds are natural organic matter and they increase nutrient levels and improve soil quality as they decompose. This in turn will increase the level of activity of earthworms and other beneficial microorganisms (Ravikumar, 2014). Tea grounds that are added to the soil will also provide benefits, such as improved oxygenation, that create a stronger root system for your plants. Because plants take water and nutrients in through the root systems, the result is more vibrant and the healthier plants can be obtained.

CONCLUSION

The research shows that rose plants planted in soil mixed with tea leaves will grow more quickly, is proven to be true. Synthetic fertilizers are used throughout the world, which is not only costly, it degrades the quality of soil in a long run. Compost from vegetable and fruit waste is certainly a good alternative for synthetic fertilizers. On the grounds of cost and ease to use, tea grounds prove to be a good and natural soil additive. Any household will have tea grounds as a waste. It is the awareness which is required for the right use of tea grounds. Rose plants occupy almost all the home garden. Rose plants can definitely blossom more, simply by the addition of tea grounds to the soil.

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