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Evaluate the effects of different types of compost in potting cultivation bed on growth characteristics and petunia flowering cultivars (Petunia hybrida)

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ABSTRACT: Petunia (Petunia×hybrida) belongs to the Solanaceae family. Composting relies upon an indigenous population of microorganisms from the environment carried by most organic materials. Microorganisms are, in general, inefficient in trapping energy released during the oxidation of organic substrates. Energy that is not biochemically captured in the catabolic degradation of substrates is dissipated to the environment as heat. In this study the effects of two factors factorial based on completely randomized design with five replicates were analyzed. Factors investigated in this study include: different types of compost (A), which includes the following areas: soil only (control) (a1), 25 percent Azocompost (a2), 25% vermicompost (a3), 25% compost (a4). Variety of factors (B) at three levels: petunia vs. Bravo pink (b1), petunia figure Flash Red (b2), petunia digits Prism Sunshine (b3). In this experiment, a total of 12 treatments and four replications examined.

***Keywords*:** Compost, growth, petunia.

INTRODUCTION

Petunia (Petunia×hybrida) belongs to the Solanaceae family (Paxton, 1836). Petunias are perennials in warm climates and are used mainly as annual bedding and container plants in temperate zones (Baily, 1976). Composting relies upon an indigenous population of microorganisms from the environment carried by most organic materials. Microorganisms are, in general, inefficient in trapping energy released during the oxidation of organic substrates. Energy that is not biochemically captured in the catabolic degradation of substrates is dissipated to the environment as heat. This is not normally noticed when the material is spread over a large area of ground. But compost piles restrict the dissipation of heat, leading to an increase in temperature (Zibilske, 1998). There is increasing interest in the potential use of vermicomposts as plant growth media and soil amendments. These are products of a non-thermophile bio degradation of organic materials through interactions between earthworms and microorganisms. In vermicompost, compared to conventional compost, accelerated bio-oxidation of organic matter is achieved mostly by high density earthworm populations (Domi, 1997; Suble, 1998). Vermicomposts are typically finely divided peat-like materials with high porosity, aeration, and drainage water holding capacity (Edwards and Burrows, 1998). Aeration has an indirect effect on temperature by speeding the rate of decomposition and therefore the rate of heat production. The air requirement depends upon the type of waste (type of material, particle size), the temperature of the compost and the stage of the process. Air supply can be controlled to some extent by the use of a system of aeration. Under natural conditions warm air diffuses from the top of the windrow drawing fresh air into the base and Sides (Hellmann, 1997). Aeration is further encouraged by periodic turning of the

windrow. Alternatively, air may be actively forced into the pile, usually within a closed or in-vessel system with the aim of maximizing the rate of microbial decomposition. This is relatively costly, but is useful for materials that pose health risks. Forced aeration has also been used successfully on static piles giving a high degree of process control (Sesay, 1997).

MATERIALS AND METHODS

Greenhouse experiment in 2012, located in the vanguard of latitude 50 degrees, 11 minutes north of Karaj Hisarak and longitude 35 degrees 31 minutes east, with an altitude of 1360 meters above sea level, was carried out.

Table 1. Soil properties used

Soil acidity (pH)	7.7
EC Dsm-1 (EC)	24.1
Sand	40
Clay	38
Silt	22
Percentage of total nitrogen	0.075
Phosphorus (p.p.m)	4
Potassium (p.p.m)	150
Tissue type	Clay loam

In this study the effects of two factors factorial based on completely randomized design with five replicates were analyzed. Factors investigated in this study include: different types of compost (A), which includes the following areas: soil only (control) (a1), 25 percent Azocompost (a2), 25% vermicompost (a3), 25% compost (a4). Variety of factors (B) at three levels: petunia vs. Bravo pink (b1), petunia figure Flash Red (b2), petunia digits Prism Sunshine (b3). In this experiment, a total of 12 treatments and four replications examined.

Table 2. Used azocompost properties

N (%)	3
P (%)	1.2
K (%)	0.4
Ca (%)	1.1
Mg (%)	1.2
Na (%)	0.46
Cl (%)	0.6
EC (dS/m)	3.1
PH	5.7

Characterization of soil and compost types used in this experiment, soil samples prepared in the laboratory was Physical and chemical analysis of soil and compost types used in Tables 1, 2, 3 and 4 are shown.

Table 3. Used vermicompost properties

N (%)	1.15
P (%)	0.38
K (%)	0.86
Ca (%)	1.1
Mg (%)	0.48
Na (%)	0.46
Cl (%)	0.47
EC (dS/m)	2.1
PH	3.7

Petunia of seeds was sown in trays containing coco. After the 4-3 leaf stage seedlings were into 12 cm diameter plastic pots containing specific substrates (soil, azo compost, vermicompost and compost) were transferred.

Table 4. Used compost properties

N (%)	7.4
P (%)	3.38
K (%)	5.82
Ca (%)	3.1
Mg (%)	0.45
Na (%)	2.34
Cl (%)	2.45
EC (dS/m)	12.3
PH	6.7

Plants were grown in a greenhouse during the day to night temperature of 25 to 18 ° C; light intensity and relative humidity 65 percent were raised mmol/m2/s1 85. During the period of growth and flowering of measures such as irrigation, nutrition and combating weeds (as hand weeding) were performed. During the experimental period the plants were irrigated based on the estimated percentage of field capacity equally.

RESULTS AND DISCUSSION

The effect of compost on fresh weight , shoot dry weight , shoot length , number of leaves, peduncle length and leaf area were not significant . Cultivar effects on flower weight, flower number, fresh weight, root fresh weight and plant height in % probability level branches and root dry weight were significant at the 5% level. Analysis of variance showed that the interaction of compost in flower and root dry weight vs. weight % probability level and on the level of 5% is significant.

Flower weight

Analysis of variance showed a significant effect on the level of one percent of the compost had put on weight. Effect of variety on Flower weight, was significant at the one percent level. Analysis of variance showed that the interaction of compost in the figure on the Flower weight% probability level is significant. Comparison of means indicates that the most effective treatment vermicompost and compost azocompost than Flower weight relative to the control is on. Flower weight had no significant effect on the compost. Comparison of the figures shows that the average maximum weight Bravo pink flowering cultivar is.

Number of flowers

Analysis of variance showed a significant effect of compost on Number of flowers was five percent probability level. Effect on the number of varieties of flowers, was significant at the one percent level. Analysis of variance showed that the interaction of compost in the figure on the number of goals in the five-percent level is significant. Comparative results show that the average treatment vermicompost and azocompost greatest effect on Number of flowers is relative to the control. Compost effect on Number of flowers was not significant. Comparison of the figures shows that the average maximum number of digits Bravo pink flower is.

Root fresh weight

Analysis of variance showed a significant effect of compost on root fresh weight was % probability level. Effect of variety on root fresh weight, was significant at the one percent level. Analysis of variance showed that the interaction between the amounts of compost on root fresh weight was not significant. Comparative results show that the average treatment vermicomposting greatest effect on root fresh weight than the control has. Azocompost and compost effects on root fresh weight were not significant. Comparison of the figures shows that the average number of root fresh weight was different from each other, so that the highest root fresh weight of the figure is Flash red and Bravo pink.

Fresh weight of shoots

Analysis of variance showed that the type of compost had no significant effect on the fresh weight of shoots. Effect on the number of branches, fresh weight, was significant at the one percent level. Analysis of variance showed that the interaction was not significant branch of fresh compost in the figure. Comparison of means indicates no significant effect on the type of compost is wet branches. Comparing the average figures show that the number of different branches so that more weight than the maximum weight branching cultivar is Bravo pink.

Root dry weight

Analysis of variance showed a significant effect of compost on root dry weight of one percent probability level. Effect of variety on root dry weight, was significant at the five percent level. Analysis of variance showed that the

interaction of cultivar on root dry weight of compost % probability level is significant. Comparative results show that the mean root dry weight of compost treatments did not differ from each other but were significantly different than control. Comparison of the figures shows that the average number of root dry weight was different from each other, so most of the root dry weight figure is Flash red and Bravo pink.

Dry weight of shoots

Analysis of variance showed that the type of compost, compost interaction effect of cultivar and cultivar had no significant effect on the dry weight of shoots. Comparison of mean and composting figures also showed that there was no significant difference in terms of dry branches.

Root length

Analysis of variance showed that the type of compost, compost cultivar cultivar interaction effect was not significant on root length. Comparison of the figures shows that the average number of different splice length, so the maximum length is related to the amount of Flash red compost showed no significant difference in terms of dry branches. Compost type showed that there was no significant difference in terms of length.

Plant height

Analysis of variance showed a significant effect of compost on the % level of probability was high Atlas figures. Effect of variety on plant height, were significant at the one percent level. Analysis of variance showed that the interaction of cultivar on plant height was not significantly different compost compost types showed no significant difference in terms of dry branches. Comparison of means indicates that the azo compost and compost treatments compared to the control treatment had the greatest effect on plant height. There was no significant effect of compost, vermicompost on plant height showed no significant difference in terms of dry branches. Comparison of the figures shows that the average number of each varies in height, so the maximum height of the figure is Bravo pink and Prism sunshine

Number of leaves

Analysis of variance showed that the type of compost, compost cultivar interaction effect was not significant in the figure on the number of leaves. Comparison of mean numbers and types of compost showed no significant difference in the number of leaves.

Peduncle length

Analysis of variance showed that the type of compost, compost cultivar interaction effect was not significant on a long peduncle. Comparison of mean and composting figures show that there is no significant difference in terms of the length of the pedicle.

Leaf area

Analysis of variance showed that the type of compost, compost cultivar cultivar interaction effect was not significant on leaf area. Comparison of mean and composting figures shows that there is no significant difference in terms of leaf area.

Nitrogen content of leaves

Analysis of variance showed a significant effect of composting on the nitrogen content of the leaves of one percent probability level was petunia figures. Analysis of variance showed that the interaction effect of cultivar and nitrogen content of leaf compost on the number of digits is not significant. Comparative results show that the mean percentage of nitrogen in the compost treatments is significantly different from each other. Composting was not significantly different from controls. Vermicompost and Azocompost but significantly different from the control and the nitrogen content of leaves were higher in the control and compost . Comparison of the figures shows that the average percentage of nitrogen figures was not significantly different than each other.

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