Effect of vermicompost fertilizer on performance of Oil in Basil herb

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ABSTRACT: Since the application of Biological fertilizer in Organic agriculture as one of sustainable agriculture branches is of grace importance, in this work, the effect of different levels of compost fertilizer as biological fertilizers on Basil herb is investigated. Experiments were carried out as factorial with bused plus of random blocks with 5 treatments on 4 levels of vermicompost (5, 10, 15, 20 and so tons per ha) and one animal fertilizer (20 tons per hectare) as withes in repetitions and 3times to assess the performance of oil of Basil in agricultural garden of Islamic azad university of Garmsar. Result showed that there is no meaningful difference between arrays and in arrays. But in zed and arrays, sing vermicompost fertilizer lode to an increase in performance of essence samples. Movcovev, wiccan conclude from these resulted that 3rd array and 4th treatment anew the best array and treatment.

Keywords: Basil, Oil, Organic farming, Vermin compost
Abbreviations: D-Shahed; V1-Vermicompost(5ton in hectare); V2-vermicompost(10 ton in hectare); V3-vermicompost (15 ton per hectare)- V4-vermicompost 20 ton per hectares

INTRODUCTION

Drew and semidy soil of our country which comprise soy of our agricultural lands, have low organic material contents. To improve fertilization of agricultural crops, we have to add organic materials-But traditional sources of organic materials such as animal fertilizers commit support increasing demand of agriculture to organic fertilizers (CPB Board and Partners, 2000).

Application of Organic wastes such as animal fertilucrre, waste a term sludge, municipal waste composed and so on in soil bias a suitable method for ieccepng required organic materials, improving corroded soil and providing required nutritional elements. (Davarinezhad et al, 2004).

Vermicompost includes biological organic fertilizers which are produced by continuous passing of organic materials from digestion system of species of worms thes these materials. (Gupta, 2003). upon passing through digestion system, will be mixed with vitamins and enzymes and will be very nestle for improving nutritional elements of soil. Therefore, vermi compost of worm waste is mixed with organic and nutritional elements (Ismail et al., 2003).

Vermi compost affects physical, chemical and biological properties of the soil significantly. this fertilizer modifies these properties and in addition to low specific weight, has no odour, pathogen micro organisms, non-aerial batteries and fungi (Singh, 2004).

Vermicompost is a nice change to the form, structure, porosity, ventilation, drainage and moisture. holding capacity is excellent in terms of quality, rich in humid substances absorbed the elements of carbon, nitrogen, phosphorus, potassium, sodium, calcium, iron, zinc, manganese, and other elements (Memo et al., 1998).

Ocimum basilica is a herb and one of useful and poplar vegetables which is being cultivated all around the world (Omidbaigy, 2000). This beluga to Lamiciea It is annual, vertical, having no pores, aromatic and its height approaches 30-60cm. this herb is appetizing and help treating some cordial diseases (Agnihotr and Kaushik, 1999 † Bentham, 1848.)

The level of basil oil(flavor) varies according to its origin of plantation from 0/5-1/5y (Gang et al., 2001 † Prakash, 1990 † Renato et al., 2003).

Busily oil is a yellow or greenish liquid, is aromatic and non- soluble in water, but will be solved up to times of its volume in soy Alcohol This not soluble in there or chloral form.

Basil essence is composed of 30-15% straggle or methyl-cervical, linalool; cineol, methyl cinematic, Eugnol and etc (Goldsmith, 1997).
This plant is used very much in the fields of medicine and industry, then, It is necessary to research a bout effective agricultural elements on this plants qualities and quantitative operation. Importance of basil medicinal plant in treatment of lung, Chest, appetite influence, anti sponge, ant fever, expectorant, anti-flatulent plant, in fluentual in treatment of earache, Treatment of skinny olisesases, motive of sexual desires, Treatment of asthma and antispasmoic, anti headache, giddiness, tenesmus, anti cough, angina and decrease of body is sugar, anti catching cold, constipation, blooding diarrhea is effective and is useful in the field of treatment of concern, sozak and nervous weakness (Omid Begay, 2000).

This plant is flagrant leaves which re fresh or dried are used as flavoring and food is garnish, sweetmeats and drinks. Basil plant has benefit of insecticide al and sends away mosquito, bug, snake and scorpion (Marrotti et al. 1996 : Omidaig,1997).

In Deland and his colleagues in their research about peppery mint plant concluded that use of 2 Tones in vermicomposit increases function and percent of mint oil. (Dalvand et al, 2011).

The research about mint medicinal plant showed that plants under vermicomposit treatment have no meaning full difference among treatments in the respect of percentage of mint is oil. Bovine is fertilizer treatment has most volume in the light of operation. Most operation of leaf is oil in third crinkle which has most leapt is operation accessed. (Tahami Zarandi, 2010).

Experimental discovered which have been done on geranium plant showed impoverment of oil plants operation because of vermicompost consumption (Chand et al., 2007).

Research about the influence of vermicomposit on romance chamomile oil showed that vermicomposit, especially, in the position of dryness tension improves amount of oil and romance chamomile oil quality (Liuc & Pank,2005).

MATERIALS AND METHODS

This research is done in 2011-2012 agricultural year in researching farm of agricultural form of Islamic Azad university of Garmsar. This experiment is done in the form of factorial with planning accidental complete blocks leg and 5 treatments which includes vermicompost layer ( And one Livestock fertilizer layer (20tones/hectares) as witness in 4 repeats and in 3 crinkles.

Zero depth to 30 centimeter of soil had been sampled accidentally before doing experiment which showed the results of it is physical and chemical characteristics in number 1 table. Also, water is physical and chemical and vermicomposit characteristics (table2) have been showed(table3). We divvied the earth in 5 kart with 1 meter length and their distance is 5%meter with 4 dividing repeat, then ix fertilizers with soil in the determined amount, and sprinkle basil seeds in karts in the amount of 15 grams and mixed with soil and then irrigation is done immediately and then, irrigation is done on the basis of climate conditions and daily irrigation and irrigation after 10 days and irrigation in 5 days after 20 days is done. Seeds grown after 3 days of cultivation and 80% of seeds germinated after 5 days.

First harvest is done in 24 khorad, second harvest is done after 2weeks after this date and third harvest is done 10 days later. 50 grams of product is dry materials is transferred to laboratory for measuring the amount of oil with keener machinery.

Data analyzing is done by the use of SPSS software and average comparisons is done in dunkon method in 95%possibility.

### Table 1. Soil characteristics of the test site

<table>
<thead>
<tr>
<th>Type of test</th>
<th>EC (Meq/lit)</th>
<th>Ph</th>
<th>OM (%)</th>
<th>OC (%)</th>
<th>P(ave) (Meq/lit)</th>
<th>K(ave) (Meq/lit)</th>
<th>Sand (%)</th>
<th>Silt (%)</th>
<th>Clay (%)</th>
<th>Soil text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples</td>
<td>14.69</td>
<td>7.62</td>
<td>0.96</td>
<td>0.55</td>
<td>109.7</td>
<td>894</td>
<td>22</td>
<td>60</td>
<td>18</td>
<td>Silt loam</td>
</tr>
</tbody>
</table>

### Table 1.

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Relative humidity</th>
<th>Mg (Meq/lit)</th>
<th>N (%)</th>
<th>C/N</th>
<th>Fe (Meq/lit)</th>
<th>Carbonate (Meq/lit)</th>
<th>Bicarbonate (Meq/lit)</th>
<th>K (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples</td>
<td>4.09</td>
<td>7.00</td>
<td>0.027</td>
<td>20.2</td>
<td>5</td>
<td>0</td>
<td>8</td>
<td>894</td>
</tr>
</tbody>
</table>

### Table 2. summarizes the characteristics of the water used

<table>
<thead>
<tr>
<th>Description</th>
<th>EC (ms/cm)</th>
<th>Ph</th>
<th>Carbonate (Meq/lit)</th>
<th>Bicarbonate (Meq/lit)</th>
<th>CI (Meq/lit)</th>
<th>Total anions (Meq/lit)</th>
<th>Ca (Meq/lit)</th>
<th>Mg (Meq/lit)</th>
<th>SO4 (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The normal range</td>
<td>2&gt;</td>
<td>7-7.5</td>
<td>-</td>
<td>3</td>
<td>10</td>
<td>-</td>
<td>10</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>River</td>
<td>1/3</td>
<td>7/43</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>14/3</td>
<td>2/5</td>
<td>5/5</td>
<td>1/9</td>
</tr>
</tbody>
</table>

### Table 2.

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Cations</th>
<th>SAR</th>
<th>TDS (Meq/lit)</th>
<th>Temporary hardness (Meq/lit)</th>
<th>Permanent hardness (Meq/lit)</th>
<th>Na (Meq/lit)</th>
<th>Nitrate (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>River</td>
<td>14.9</td>
<td>3.45</td>
<td>269</td>
<td>1.00</td>
<td>8.00</td>
<td>6.9</td>
<td>0.5</td>
</tr>
</tbody>
</table>

969
Table 3. Characteristics of vermicompost used

<table>
<thead>
<tr>
<th>Type of test</th>
<th>Ec Ds/m</th>
<th>Ph</th>
<th>P(ave)</th>
<th>K(ave)</th>
<th>TotalN</th>
<th>Fe</th>
<th>Zn</th>
<th>Cu</th>
<th>Mn</th>
<th>OM</th>
<th>Mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>4.17</td>
<td>7.25</td>
<td>0.425</td>
<td>1.68</td>
<td>3896.5</td>
<td>117.15</td>
<td>14.8</td>
<td>275.75</td>
<td>62.71</td>
<td>230.25</td>
<td></td>
</tr>
</tbody>
</table>

RESULTS AND DISCUSSION

As we have seen, there is no effect of vermicompost on askance operation in 3 crinkles among treatments with no meaning full difference and there is no meaning full difference among crinkles. But, V4 treatment in second treatment is crinkle is most famous treatment. V4 (20 tones vermicompost/hectare) and V2 (0 ton vermicompost/ hectare) and D treatments in third crick has operation on the basis of these data, third crinkle is best crinkle in the light of oil operation and V4 treatment (20 tones vermicompost in hectares) and D treatment are best vermicompost includes very rich ingredients especially NH2 which gradually give them to plant. This point is very important in the light of soil is fruit fullness, this fertilizer has larger ingredients in compulsion with other organic fertilizer. Vermicompost has micro elements like iron, copper, zinc, manganese. Also, It grows plant because it has materials like B12 vitamin anal motive elements Oxin (Edwards., 2004).

In the interpretation of results of improvement of oil amount by influence of composition of vermicompost fertilizer, we can say, Because oils are in the form of terpenoidi mixtures which their constructive section need NADPH and ATP and phosphorous is necessary for forming recent mixtures, then (Loomis & Corteau, 1972). The increasement of vermicompost amount by producing the more attraction of nitrogen and phosphorous which present in elements which oil increases the oil amount. The research relationship which has been done by different vermicompost on basil plant showed that consumption of vermicompost is very better in the light of oil amount than witnesses (Anwar et al., 2005).

In the field of increcent of amount of oil, it can said that increcent of attraction of nitrogen elements and phosphorous because of application of biologic and chemical application than witness is effective in improvement of oil (sangwan et al., 2001).

ACKNOWLEDGEMENTS

This study is supported by the Islamic Azad University, Garmasar branch

Table 4. the mean values of the essential characteristics of treatment and comparison groups according to Duncan test

<table>
<thead>
<tr>
<th>Treatments</th>
<th>China 2</th>
<th>China 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>D (control)</td>
<td>.5613&lt;ab&gt;</td>
<td>.6505&lt;ab&gt;</td>
</tr>
<tr>
<td>V1 (5% vermicompost)</td>
<td>.0000&lt;ab&gt;</td>
<td>.0000&lt;ab&gt;</td>
</tr>
<tr>
<td>V2 (10% vermicompost)</td>
<td>.1938&lt;ab&gt;</td>
<td>.6538&lt;ab&gt;</td>
</tr>
<tr>
<td>V3 (15% vermicompost)</td>
<td>.1220&lt;ab&gt;</td>
<td>.5445&lt;ab&gt;</td>
</tr>
<tr>
<td>V4 (20% vermicompost)</td>
<td>.4460&lt;ab&gt;</td>
<td>.6693&lt;ab&gt;</td>
</tr>
</tbody>
</table>

*: Data are means of three replicates. Mean values followed by different letters (a, b, c, d, e) are significantly different, according to the Duncan's test.

Figure 1. Effect of different treatments on essential oil of basil herb in China 2 and 3
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