EFFECT OF ORGANIC FERTILIZER ON THE GROWTH PERFORMANCE Of 
Brassica rapa UNDER LA UNION, PHILIPPINES

ANGELITA J. PRADO
Don Mariano Marcos Memorial State University
La Union, Philippines

ABSTRACT

Growth performance of Pechay, Brassica rapa, was tested using two organically 
produced composts and an inorganic fertilizer serving as control. Addition of Bio-
N during the basal application was part of the organic inputs. Treatments were 
distributed in 4 replicates following the Randomized Complete Block Design 
(RCBD). Each treatment was composed of 16 plants at a distance planting of 
20cmx40cm between hills and rows respectively. Application of basal fertilizer 
was done and harvesting was conducted twice starting from 30 days and 34 
days. The effect of fertilizer was measured in terms of plant height, leaf area, 
weight of marketable leaves, weight of marketable plant, number of leaves per 
plant and the leaf area infestation. Except for leaf area pest infestation, result 
showed that those plants applied with vermicompost manifested the highest 
mean, though insignificant differences existed (P>.05) Hence, use of organic 
fertilizer is comparable with the use of urea in pechay production. It is 
recommended to organic farmers and gardening enthusiasts that use of organic 
inputs is preferred due to its economic and environment friendly attributes.

INTRODUCTION

Pechay, Brassica rapa is a popular table vegetable in the Philippines. Also 
known as snow cabbage, Chinese chard or Chinese white cabbage, it is 
consumed as raw and cooked. Ideally, it is taken in raw to prevent possible loss 
of its nutritional value when heated. It is an excellent source of income and a 
hobby even for limited space adopting the very popular vertical gardening with 
the use of recycled containers as potting media.
Organic farming produces nutrient-rich fertile soil which nourishes the plants. Keeping chemicals off the land protects water quality and wildlife. It's also about

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practicing good animal welfare where everything from breeding, rearing and handling, up to feeding of animals is strictly regulated thus implementing a free range lifestyle. Republic Act 10068 of the Philippines aims to strengthen the state’s policy to promote, propagate, develop further and implement the practice of organic agriculture. Farming communities are hoped to ensure and cumulatively condition and enrich the fertility of the soil, increase farm productivity, reduce pollution and destruction of the environment, prevent depletion of natural resources and protect the health of the farmers, and of the general public.

Application of organic fertilizers is one of the favored methods of rejuvenating depleted soils and sustaining fertility levels. In mature soils, crops respond more to the addition of organic fertilizers than of chemicals. (PCARRD, 2006). Successive cropping of pechay grown in pots with vermicompost and ordinary garden soil as medium in different combinations favored the growth and development of pechay and gave higher income. Likewise, for pechay (*Brassica pekinensis* L.) commercial production, the use of commercial compost fertilizer together with commercial effective microorganism is recommended for higher growth and yield. (Pascual, et.al, 2013.)

**MATERIALS AND METHODS**

Experimental treatment and design

The study was conducted at the Don Mariano Marcos Memorial State University in Bacnotan, La Union Philippines. Growth of the Brassica rapa, popularly known as Pechay, was measured in plant height, leaf area, weight of marketable leaves, plant weight, number of leaves per plant and leaf area infestation. Three treatments were employed, these were Vermicompost (T₁); non-vermicompost (T₂); and Urea (T₀) serving as control. Four replications were made and distributed following the Randomized Control Block Design. (RCBD).

**Compost Production**
The plain compost was produced using the formulation adopted from the organic fertilizer production training workshop conducted at Ifugao State College of Agriculture and Forestry (ISCAF now IfSU) in July 2008, (T₁). The vermicompost, (T₂) was produced using sheep manure from the University, ipil-ipil leaves, dried leaves and carbonized rice hull (CRH) as substrates and with the inclusion of vermiworms. Vermitea was further added as activator and decomposition enhancer.

**Fertilizer Application**

Fertilization was done as basal to treatments 1 and 2 with 250 grams each of the composts; Bio-N was drenched simultaneously in a solution of 2 tbsp per liter. The control treatment was applied with the recommended rate of urea, (46-0-0).

**Planting and Harvesting**

Pechay seedlings were planted on raised plots, 20cmx40cm distance between hills and rows following the Randomized Complete Block Design of experiment. At the growing stages, length of leaf area, number of leaves per plant, height of plant were measured and recorded. Harvesting was done twice, initially when the plants were 30 days old and final on the 34th day. Variables of the study were treated and analyzed employing the Simple Analysis of Variance (ANOVA).

**RESULTS**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Average values</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height (cm)</td>
<td>Leaf area (cm)</td>
<td>Marketable leaves</td>
<td>Marketable height</td>
<td>Number of leaves</td>
</tr>
<tr>
<td>T₀ Control</td>
<td>22.36</td>
<td>81.40</td>
<td>5.80</td>
<td>50.97</td>
<td>8.45</td>
</tr>
<tr>
<td>T₁ Non-vermicompost</td>
<td>24.24</td>
<td>89.23</td>
<td>6.80</td>
<td>49.66</td>
<td>9.49</td>
</tr>
<tr>
<td>T₂ Vermicompost</td>
<td>24.70</td>
<td>90.95</td>
<td>6.75</td>
<td>55.47</td>
<td>10.05</td>
</tr>
</tbody>
</table>

*P > .05*

Table 1 shows the effect of the different treatments on the growth of *B. rapa* under DMMMSU, La Union condition. As to the height of the pechay plant, those applied with vermicompost, (T₂) are the tallest followed by those applied with non-vermi compost, (T₁) while those fertilized with urea, (T₀) were the smallest. Statistical result using ANOVA showed insignificant effect of fertilizer applied.
Longest leaves of pechay were manifested among plants fertilized with vermicompost, (T₂) followed by those with non-vermi compost, (T₁) and shortest leaves were evident among plants fertilized with urea(T₀). ANOVA test result, however, showed insignificant effect. While the use of nonvermi compost, (T₁) and vermin compost, (T₂) recorded the 1st and 2nd highest marketable leaves, and use of urea, (T₀) had least, statistical result revealed no significant difference.

Consistently, those applied with vermicompost, (T₂) showed the heaviest weight of marketable plant, while those applied with non-vermi compost, (T₁) were the lightest. Statistical result, however, also revealed no significant effect of fertilizer applied. In terms of the number of leaves per plant, those applied with vermicompost, (T₂) gave the highest mean yield while those applied with urea, (T₀) got the lowest. Nevertheless, test revealed no significant difference on the effect of fertilizer used as to the number of leaves.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀ Control</td>
<td>2.85</td>
</tr>
<tr>
<td>T₁ Non-vermicompost</td>
<td>1.85</td>
</tr>
<tr>
<td>T₂ Vermicompost</td>
<td>4.20</td>
</tr>
</tbody>
</table>

As to the performance of the 3 fertilizers applied, plants with vermicompost, (T₂) showed the highest mean on infestation followed by those with urea, (T₀) and the least are those applied with non-vermi (T₁) compost. (Table 2). Findings, however, showed no significant difference existed.

**CONCLUSION AND RECOMMENDATION**

Growth parameters such as plant height, length of leaf area and number of leaves per plant were not affected by the application of vermicompost, plain compost and urea. Likewise, yield parameters such as weight of marketable leaves and of plants, number of marketable leaves and the occurrence of insect pest infestation were not influenced by the application of vermicompost, plain compost and urea. It is recommended to apply vermicompost earlier, say, 25-30 days before planting for a more established nutrient incorporation with the soil, and for more robust and heavier pechay yield. Apply natural botanical pesticides
to prevent insect pest infestation of vermicompost fertilized pechay plants for more attractive appearance. Intensify the promotion of vermicompost fertilizer as a contribution to mitigate climate change. Lastly, success of organic farming requires timeline of interdisciplinary collaborations among research institutions, a strong advocacy and a willful leadership.

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