

## **Yield Performance of Cabbage (*Brassica oleracea* L.) Applied with Varying Amounts of Garlic (*Allium sativum* L.) Wastes Concentrates**

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### **Abstract**

*A field experiment was conducted in Naglaoca-an, Sta. Domingo, Ilocos Sur from January 2, 2010 to March 30, 2010. It aimed to determine the effectiveness of garlic wastes as fertilizer on the yield of cabbage and to determine which treatment gives the best result on the yield of cabbage.*

*The field response of FIKK cabbage was evaluated using the following treatments: T0 – control (plain water), T1 – 2 kg of soaked garlic wastes at 1 gal of plain water; T2 – 4 kg of soaked garlic wastes at 1 gal of plain water; and T3 – 6 kg of soaked garlic wastes at 1 gal of plain water. These treatments were allocated in their respective plots following the procedures in Randomized Complete Block Design (RCBD) with three replications.*

*Results showed that the effect of applying 6 kg of soaked garlic wastes with 1 gal of water to FIKK cabbage is comparable to the other treatments with 4 kg of soaked garlic wastes having 1 gal of water and 2 kg of soaked garlic wastes having 1 gal of water. These promising results observed, however, were significantly better at .05 level than those obtained from FIKK cabbage applied with plain water only.*

*This implies that using soaked garlic wastes would lessen the burden of farmers in their farming expenses due to its most economical way of using it.*

## Introduction

### Background of the Study

Cabbage (*Brassica oleracea* L.) is a heat tolerant hybrid plant which is generally suited in lowland culture. It matures three (3) months after seeding or 60-70 days after transplanting and yields about 15-20 tons / ha.

Since Ilocos Region is an agricultural area and the main source of livelihood is farming, organic fertilizers, on the other hand, are very rare. Most of the farmers used commercial fertilizer to hasten the growth and development of their crops. But most of them are complaining due to the high prices of the commercial fertilizers.

At this juncture, organic fertilizer can penetrate the farmers most especially those who are planting cruciferous crops.

The rapid decline of soil fertility brought about by the total neglects of most crop producers in restoring the organic matter content of the soil indicate the need for organic fertilizers. It would, in a way, reduce production cost, help build and maintain soil fertility aside from the important role it plays in the maintenance of ecological balance.

Today, the potentials of various agricultural wastes as a source of organic fertilizer are being evaluated.

Obviously, the use of garlic wastes is a likely alternative for the types of organic wastes which undergo decomposition prior to utilization. However, its value as an organic fertilizer as well as the effect of cabbage growth and development is not yet well established.

### Objectives of the Study

1. to determine the effectiveness of garlic wastes as fertilizer on the yield of cabbage.
2. to determine which treatment: T0 – control (plain water), T1 – 2 kg of soaked garlic wastes at 1 gal of plain water, T2 – 4 kg of soaked garlic wastes at 1 gal of plain water, and T3 – 6 kg of soaked garlic wastes at 1 gal of plain water gives the best result on the yield of cabbage.

## Materials

1. FIKK cabbage seeds (50 g)
2. Garlic wastes
3. Plain water

## Methodology

### k Experimental Crop

Cabbage -- The FIKK Cross, a hybrid variety of cabbage was used in this study.

### Experimental Layout

After thorough land preparation, the area of 216 sq. m. was divided into 12 equal plots. Then each part was subdivided into three blocks to represent the three replications. Each block was further subdivided into four equal plots measuring 2×9 m to accommodate the four treatments with three different areas as blocks. In each block, four uniform sample plots were chosen on which the four treatments were randomly assigned. The Randomized Complete Block Design (RCBD) was used in this study.

### Transplanting the Seedlings $f$

The seedlings of uniform growth were transplanted one (1) month after sowing. Transplanting in each replication was done late in the afternoon to prevent the new transplants from wilting. Extra care was observed in pulling the seedlings to avoid injury.

### k Watering the Plants

The plants were watered once everyday either in the morning or late in the afternoon until the plants had fully recovered and were ready for harvest.

### Spraying of Soaked Garlic Wastes Concentrates

To obtain the concentrates, garlic wastes were dried thoroughly and before they were applied to the cabbage as foliar spray, varied amounts of garlic wastes diluted with water were soaked within three days. This was done in weekly intervals.

### k Cultivation and Weeding

Shallow cultivation was done as the weeds emerged. This operation was supplemented by hand weeding to remove the weeds growing near the base of the plants. Cultivation was done to control the growth of weeds and to loosen the soil for better aeration, root development and penetration. The last cultivation was done by hilling-up.

### Harvesting

Harvesting of cabbage plants was done showing the indication of head compact with the use of sharp knife to avoid injury to any part of the cabbage plant.

### k Gathering of Data

The data gathered were: average yield of the samples of cabbage head/curd per sample plant and the computed yield in kg. per hectare.

The data gathered was analyzed using the Analysis of Variance (ANOVA) procedure.

## **Review of Related Literature**

According to Marble (2008), the use of natural liquid organic garlic fertilizer to grow your garlic naturally is good for the environment and costs less than harmful chemical fertilizers.

Garlic responds to a banded pre-plant application of All Natural Liquid Garlic Fertilizers, with regular subsequent applications at the two critical stages of growth: emergence and just prior to bulbing. Once bulbing has begun additional garlic fertilizer has no significant effect. All Natural Liquid Lime can be amended to the final application when conditions call for extra calcium.

Apply All Natural Liquid Organic Garlic Fertilizer in early morning or late evening. Do not apply before rainfall or irrigation. Some growers are finding that Natural Garlic Fertilizer applications alone eliminate the need for pesticide applications on certain pests when they are applied at the same time as pesticides.

According to Marble (2010), organic fertilizer hold nutrients at a hidden capacity than chemical fertilizers do, when used properly.

Normally, anyone switching from a synthetic fertilizer to an organic fertilizer should beware of low yields and not much immediate improvement. This is because the chemicals that have fed to the crops have depicted all that nature had to offer, and it takes time for that to be replenished.

The best farm fertilizer to use so that we can save our environment, preserve our soil, and keep our bodies healthy is an organic fertilizer. It's a nutrient rich fertilizer that will do wonders for any crop, that's a promise.

### Highlights of Results

**Table 1. Average Yield on the Samples of Cabbage Head Subjected to Different Treatments**

| TREATMENTS  | YIELD   |             |
|---|---------|-------------|
|   | Kg/plot | Kg/ha       |
| T <sub>a</sub> (plain water) control                            | 7.25    | 4, 027.77a  |
| T <sub>1</sub> - 2kg of soaked garlic wastes at 1 gal of water  | 11.33   | 6, 294.44a  |
| T <sub>2</sub> - 4 kg of soaked garlic wastes at 1 gal of water | 11.95   | 6, 638.88a  |
| T <sub>3</sub> - 6kg of soaked garlic wastes at 1 gal of water  | 20.58   | 11, 433.33b |
| Cv%)  | 2.77    |             |
| Significance  | ¥       | ¥           |

**Actual yield in kg of FIKK cabbage per 18 sq.m** Plants applied with 6 kg of soaked garlic wastes diluted with 1 gal of water (T<sub>3</sub>) produced the highest actual yield with a mean of 20.58 kg while the lowest yield with a mean of 7.25 kg are obtained from the plants applied with plain water (T<sub>a</sub>) only.

**Computed yield in kg/ha of FIKK cabbage.** Plants applied with 6,000 kg of soaked garlic wastes diluted with 1,000 gal of water (T<sub>3</sub>) obtained the highest yield with a mean of 11,433.33 kg/ha. The lowest computed yield was obtained by FIKK cabbage applied with plain water (T<sub>a</sub>) having a mean yield of 4,027.77 kg/ha.

Analysis of variance reveals significant results on weight in kg as affected by the different treatments. This clearly indicates that a higher concentration of soaked garlic wastes could be attributed to effectiveness of producing profitable cabbage plants.

**Table 2. Cost and Return Analysis of FIKK Cabbage as Affected by Different Treatments**

| Treatment  | Yield/Plot (kg) | Yield/Ha (kg) | Gross Sale (Php/ha) | Production Cost (Php/.25 ha) | Net Income (Php/ha) | Return of Investment (%) |
|--|-----------------|---------------|---------------------|------------------------------|---------------------|--------------------------|
| T- cabbage treated with plain water (control)                            | 7.25            | 4,027         | 40,277.70           | 3,950                        | 36,327.70           | 90.19                    |
| T,- cabbage treated with 2 kg of soaked garlic wastes at 1 gal of water  | 11.33           | 6,294.44      | 62,994.40           | 3,950                        | 58,994.40           | 93.72                    |
| T,- cabbage treated with 4 kg of soaked garlic wastes at 1 gal of water  | 11.95           | 6,638.88      | 66,388.80           | 3,950                        | 62,438.80           | 94.05                    |
| T, - cabbage treated with 6 kg of soaked garlic wastes at 1 gal of water | 20.58           | II, 433.33    | 114,333.33          | 3,950                        | 110,383.30          | 96.55                    |

*Cabbage sold at Php 10/kg*

On the computed net income of cabbage per hectare, Treatment 3 treated with 6,000 kg soaked garlic wastes diluted with 1,000 gal of water produced the highest with Php 110,383.30. Treatment 0 (control) got the lowest net income of Php 36,327.70 because the cabbage was treated with plain water only.

## Conclusions

FIKK cabbage treated with greater concentration of soaked garlic wastes significantly produced the highest cabbage head yield.

Soaked garlic wastes have versatile uses as fertilizer and pesticides.

Actual yield of FI KK. cabbage is comparable to the effect of soaked garlic wastes applied at the rate of 6,000 kg diluted with 1,000 gal of water per hectare


## Recommendations


1. Although promising results were noted, still further studies along this line of interest deemed necessary before a clear-cut recommendation regarding the full used of soaked garlic wastes in FI KK cabbage production could be made.

2. Commercial fertilizer is also recommended instead of plain water only as the control to compare the agronomic characteristics and yield of cabbage plants and other allied vegetables.

## References

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