



## UTILIZATION OF TEA AND USED BOTTLES AS A MEDIUM TO GROW KANGKUNG VEGETABLE HYDROPONICS IN BULAKAMBA VILLAGE

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### ABSTRACT

*Land kale (Ipameareptans Poir) is a short-lived type of vegetable plant with a high nutritional content, namely vitamins A, B, C, protein, calcium, sterol silo, phosphorus, and mineral ingredients in the form of iron that is useful for the growth and health of the body. The need for vegetables in the market is quite high, household land is reduced, and this large amount of plastic bottle waste leads to the need for new innovations in households to grow vegetables independently using a simple hydroponic system. Therefore, this community service aims to provide knowledge and training to the community about the influence of tea amps used as a substitute for simple household hydroponic planting media. The methods used are lecture methods and simulation and practice methods. Tea amps contain several elements such as zinc (Zn), phosphorus (P), nitrogen (N), copper magnesium (Mg), and calcium (Ca) that can help grow crops. Thus, based on observations of kale seeds at the age of  $\pm 2$  weeks has reached a height of 12-15cm and is ready to harvest at the age of 3-4 weeks.*

Kangkung darat (*Ipameareptans Poir*) merupakan jenis tanaman sayur yang berumur pendek dengan kandungan gizi yang cukup tinggi, yaitu vitamin A, B, C, protein, kalsium, silo sterol, fosfor, dan bahan-bahan mineral berupa zat besi yang berguna bagi pertumbuhan dan kesehatan badan. Kebutuhan akan sayur di pasaran yang cukup tinggi, lahan rumah tangga yang berkurang, serta limbah botol plastik yang banyak ini menyebabkan perlu adanya inovasi baru di rumah tangga untuk menanam sayuran secara mandiri dengan menggunakan sistem hidroponik sederhana. Oleh karena itu, pengabdian masyarakat ini bertujuan untuk memberikan pengetahuan dan pelatihan kepada masyarakat mengenai pengaruh ampas teh yang digunakan sebagai pengganti media tanam hidroponik rumah tangga secara sederhana. Metode yang digunakan adalah metode ceramah dan metode simulasi dan praktek. Ampas teh mengandung beberapa unsur seperti seng (Zn), fosfor (P), nitrogen (N), tembaga magnesium (Mg), dan kalsium (Ca) yang dapat membantu menumbuhkan tanaman. Sehingga, berdasarkan pengamatan benih kangkung pada usia  $\pm 2$  minggu telah mencapai tinggi 12-15cm dan siap panen pada usia 3-4 minggu.

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## INTRODUCTION

Land kale (*Ipomeareptans Poir.*) is a plant that is familiar to Indonesian people, kangkung is a type of vegetable plant that is short-lived, with a high nutritional content, namely vitamins A, B, C, protein, calcium, cytosterol, phosphorus, and mineral ingredients in the form of iron that are useful for growth and health of the body. Kale vegetables can grow well in the yard, as well as rice fields (Irawati et al., 2013).

The need for vegetables in the main market is as household consumption as well as procurement for some restaurants to serve vegetable-based foods. (Rianti et al., 2019). Cultivation of kale plants can be done conversional as well as with hydroponic systems. But as the era of agricultural land and plantations developed into industrial estates, housing, and tall buildings. As a result, farmland is narrower and less. Therefore, the cultivation of vegetable crops that can be done is with hydroponic system that can be done in limited land conditions (Roidah, 2014). Hydroponics is a plant cultivation system that uses water. Media for cultivation of plants with hydroponic systems can be sand, rock wool, gravel, perlit, coconut sabut, sawdust, peat, buoyancy, nut shell, polyester, or vermiculite (Mardina et al., 2019).

Based on research conducted by Widyati (2004) titled "Utilization of Tea Ampcompost as a Substitution of Nitrogen Sources in Sweet Corn Crops (*Zea mays Saccharata*)" it is obtained that tea can have a noticeable influence on the increased production and height of sweet corn crops and can replace some sources of nitrogen for sweet corn crops.

Tea is a drink that is often consumed by the public. Based on the initial observations made around the home environment, it is known that the tea that is drunk usually leaves the ampas and the ampas are just discarded by housewives after being consumed without being consumed without being utilized because it has not known that the tea can be used for plants. Tea ampas contain a number of minerals Zn, Se, Mo, Ge, and Mg, N. The mineral content contained in the tea is an essential element that plants need if the plant lacks any of these elements then plant growth will be disrupted. Tea can also contain carbohydrates that have a role as chlorophyll shaper on the leaves (Gultom, 2018).

Based on the study of the problems faced, this community service activity aims to provide knowledge or training to the community in order to utilize tea plantations for the cultivation of hydroponic plants.

## PROBLEM

The need for vegetables in the market is quite high, household land is reduced, and this large amount of plastic bottle waste leads to the need for new innovations in households to grow vegetables

independently using a simple hydroponic system. Related to this, it is necessary to do training in the treatment of plastic bottle waste and tea waste as a medium of hydroponic planting of kangkung plants. Still, the lack of knowledge and skills of the community in Bulakamba Brebes Village in the use of plastic bottle waste and tea waste caused the waste to be left alone. Therefore, to improve the knowledge and skills of the community in Bulakamba Brebes Village, there needs to be training in plastic bottle waste treatment and tea as a hydroponic planting medium.

## METHOD

The methods used in this devotion are lecture methods as well as simulation and practice methods. The lecture method is a learning method used to convey lessons/information that is appropriate for the purpose of learning. Meanwhile, Simulation and Practice Method is one of the learning methods that provides presentation in the form of lessons using situations and a real process.

The tools used in this study were solders or could use heated iron spikes, used bottles, and spray sites. Materials used water, tea tap marks, and kale seeds. The first stage in this experiment was to prepare a used bottle and then hole the bottom using a solder, if no solder could use heated iron spikes. After that put the used tea to fill half a bottle then put the seeds of the kale plant then covered with used tea and spray with a little water. The second stage, prepare the bottle again for the bottom. Hole the sides and bottom of the bottle to facilitate water circulation. After that, overlap the second bottle under the first bottle. Then the second bottle is filled with water to taste. Water change is done every 3 days so that the tea cannot dry. This kale plant should also be exposed to sufficient sunlight. So as not to get ticketed. Kutilang is a hydroponic plant disease due to lack of light and excess water. If a hydroponic plant is exposed to disease, then the plant will grow tall only and the leaves are pale green.

## RESULTS AND DISCUSSIONS

This community service activity was conducted by students of KKN BMC State University Semarang year 2020. This hydroponic training activity is one way to minimize and reduce household waste such as tea bags and plastic packaging bottles so as not to cause pollution.

At the time of this training activity, the special residents of Bulakamba village are very enthusiastic about paying attention to the material that is being delivered. In addition, residents are also able to practice how to make household hydroponics in a simple way that starts from preparing used bottles as a planting medium to the stage of seeding.

Of the many household wastes are very dangerous to the environment and human health namely plastic waste, whose existence is sometimes considered small. Plastic is indeed one of the environmental's biggest 'enemies', used plastic bottles are one of them. Plastic has an adverse impact on the environment due to the nature of plastic that is difficult to decipher by the soil even though it has been stockpiled for many years. Utilization of inorganic waste is one that can be done by the whole community to maintain environmental sustainability. One simple way of processing waste that can be done is by utilizing used plastic bottles that are in the environment as hydroponic planting media.

Kale (*Ipomeareptans Poir*) is a plant that belongs to a type of vegetables and is grown as food, kangkung is widely sold in markets. Kangkung is widely found in the asian region and is a plant that can be found almost everywhere especially in watery areas. Kangkung is a plant that can be cultivated by hydroponic method. The growth process is characterized by the formation of an organ in the plant that undergoes changes such as the formation of leaves, natang, seeds, and fruit. All parts of plants that are directly or indirectly useful for enforcing plant life, namely those that are especially useful for the absorption, processing, transport, and hoarding of substances (Tjitrosoepomo, 2007). The addition of tea amps as a planting medium gives effect to plant growth.

With the training of utilization of tea and used bottles as a medium of hydroponic planting, residents are expected to apply and practice the cultivation of hydroponics of this household simply by utilizing tea plantations, plastic packaging bottles and utilizing residential land to the maximum for use as hydroponic vegetable cultivation land. Hydroponics are one of the solutions for farming in a limited yard.

**Figure 1. Implementation of Kangkung Hydroponic Cultivation Training by Utilizing Tea And Used Bottles**



## CONCLUSION

Kale is a type of short-lived vegetable plant with a fairly high nutritional content. Cultivation of kale crops can be done conventionally as well as with hydroponic systems. As for this training using hydroponic methods by utilizing used tea amps and

plastic packaging bottle waste. The training is aimed at providing knowledge and training to the community in order to utilize household waste such as tea and used bottles, as well as utilizing existing residential land for the cultivation of hydroponic plants. Further activities need to be done a combination of tea plantation media to the trainees in order to compare the results obtained from the tea plantation media with the medium of planting the combination of tea amps with other dregs.

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