

CULTIVATION OF HYDROPONIC PLANTS AS UTILIZATION OF NARROW LAND FOR THE CALINGCING VILLAGE FARMER'S GROUP, SUKAHENING SUB-DISTRICT, TASIKMALAYA DISTRICT

Intan^{1*}, Nova Defita¹, Kresna Azhi Fahlevi¹, Muhammad Andriko Alamsyah¹, Syahrul Mubarak¹, Andi¹

¹ UIN Sunan Kalijaga, Yogyakarta
*20105010079@student.uin-suka.ac.id

Abstract - *The development of technology in the world in recent years has been rapid, as well as in the agricultural sector. People are also encouraged to adapt by utilising technological advances so as not to be left behind while overcoming the problem of narrowing agricultural land. One of the technologies that must be developed is hydroponic technology. This technology was created in order to utilise limited land with maximum results. Hydroponic plant cultivation is expected to be an alternative for people who lack land, so that it can be used as a source of income or personal needs. Hydroponics is a method of growing plants using alternatives to soil such as cork, cotton, foam, coconut fibre, gravel, sand and pieces of wood. This is done as a substitute for the function of soil as a support for plant roots and an intermediary for nutrient solutions by flowing water and oxygen through these alternatives.*

Keywords: *Hydroponics, Agriculture, Narrow Land, Plants*

1. INTRODUCTION

Not only in big cities, even in villages, agricultural land has been converted into residential areas. Likewise with the current condition of Calingcing Village. Calingcing Village is a densely populated village with an area of ± 161.08 hectares with a population of 4,332 people (Profil Desa Calingcing, 2023). The density of settlements results in a lack of land for farming while farming is a very important sector for the community.

The agricultural sector is a source of income for several communities. To develop income, people need large areas of land. However, limited land is an obstacle to developing income. Therefore, with the development of technology and knowledge, there are other ways to use narrow land for farming, namely the hydroponic method.

Hydroponics is agricultural cultivation land without using soil media, so hydroponics is an agricultural activity that is carried out by using water as a medium to replace soil. So the hydroponic farming system can utilize narrow land (Roidah, 2014). Agriculture with a hydroponic system certainly doesn't need a large area of land, in practice it can be done in the yard of the house, on the roof of the house, or other land.

Considering that the need for food is increasing day by day along with the increase in population. However, the growth of agricultural land is increasingly narrow because many agricultural lands have been converted into residential areas. Seeing these conditions, the hydroponic system is the most appropriate for agricultural business models and as the right solution to address food problems.

Hydroponics is a method that is very suitable for use, because it can reduce (1) water needs, (2) the risk of unhealthy food, (3) environmental pollution. In addition, the advantages of farming with this hydroponic system are (1) the success of plants to grow and reproduce is guaranteed. (2) Treatment is more practical and pest disturbance is more controlled. (3) Fertilizer use is more efficient (efficient). (4) Dead plants are more easily replaced with new plants. (5) Does not require a lot of manual labor because the work method is more economical and has standardization. (6) Plants can grow more rapidly and in conditions that are not dirty and damaged. (7) Production yields are more sustainable and higher than planting in the ground. (8) The selling price of hydroponic products is higher than non-hydroponic products. (9) Some types of plants can be cultivated out of season. (10) There is no risk of flooding, erosion, drought, or dependence on natural conditions. (11) Hydroponic plants can be carried out on limited land or space (Waluyo, 2021).

All types of plants can be grown with a hydroponic farming system, but usually many people grow seasonal crops. Horticultural plant groups that are commonly grown with this media include: vegetable plants, fruit plants, ornamental plants, and medicinal plants. While the types of plants that can be planted with a hydroponic system include flowers (eg chrysanthemums, gerberas, orchids, cacti), vegetables (eg lettuce, mustard greens, tomatoes, carrots, asparagus, broccoli, chilies,

eggplants), fruits (eg: melons, tomatoes, cucumbers, watermelons, strawberries) as well as tubers (Roidah, 2014).

The system of this hydroponic plant is as follows: Provides food ingredients in a mineral or nutrient solution that plants need by flushing or dripping. Through this technique, more plants can be grown in a narrower space unit. In fact, without soil media, a number of more productive plants can be maintained. The system of this hydroponic plant must be free of pesticides so that there are no pests and diseases (Waluyo, 2021). On this basis, hydroponic farming in Calingcing Village is certainly a positive breakthrough for villagers who want to grow crops on limited land, especially for members of the Calingcing Village Women Farmers Group.

2. METHOD

A. Materials and tools

The materials needed for plant cultivation using the hydroponic system are plant seeds, namely kale and pakcoy (bokcoy) plant seeds, planting media in the form of rockwool, and AB MIX fertilizer nutrients. Meanwhile, the tools for making hydroponic planting facilities are several 5-inch diameter pipes, a water pumping machine, water, nails, wire, several bamboo sticks, a small hose and a large bucket.

B. Work procedures

a. Discussion and Socialization

The discussion and socialization involved all KKN members in collaboration with expert lecturers from Siliwangi University as resource persons as well as instructors and partners at the KKN site, namely members of the Dahlia Women Farmers Group (KWT Dahlia) of Calingcing Village. The material provided is material about the ins and outs of planting plants using a hydroponic system starting from the tools and materials needed, how to plant, and how to maintain it.

b. Hydroponic Planting Training

This training involved all members of the Dahlia Women Farmers Group (KWTDahlia) in Calingcing Village. The training included preparing tools and materials, making a place to put the plants and the media using pipes, briefing on how to seed and care for hydroponic plants. The hydroponic principle of NFT (Nutrient Film Technique) is used in hydroponic farming training in Calingcing Village, namely by placing plant roots in a shallow layer of water. The water circulates and contains nutrients according to plant needs. Furthermore, roots can develop in the nutrient solution, because around the roots there is a layer of nutrient solution, the system is known as NFT. Excess water will reduce the amount of oxygen, therefore the nutrient layer in the NFT system is made with a maximum solution height of 3 mm.

3. RESULTS AND DISCUSSION

The training on farming with a hydroponic system was attended by 25 female

farmer groups in the Calingcing Kidul Region, Calingcing Village. The training activities were held on July 22, 2023. The training activities consisted of two sessions, namely: the first session delivered material on hydroponic farming systems and the second session practiced hydroponic agricultural cultivation. The training also held a daily picket system to check the plants.

In the first session the material was delivered by an agricultural lecturer at Siliwangi State University. In this session the community was given material about farming systems using the hydroponic method which includes how to cultivate hydroponic plants, what plants are suitable for hydroponic plants and how to care for hydroponic plants as well as hydroponic farming business opportunities.



Figure 1. Submission of hydroponic material by Siliwangi University Lecturer

In the second session the practice of hydroponic agricultural cultivation. In this session, the practice of hydroponic cultivation was carried out together with the training participants according to the participants' knowledge and existing technology.



Figure 2. The practice of hydroponic cultivation

Hydroponic Planting Procedures (Waluyo, 2021)

Nursery. Choose quality seeds so that the quality of the fruit and vegetables produced can be optimal. Prepare the Planting Media. The requirements for planting media for hydroponics are being able to absorb and conduct water, not easily rotten, not affecting pH, sterile, and others. The planting media used is rockwool planting media (Rohmayani, 2022). Hydroponic system seeding is done using the available planting media. Insert the plant seeds into the rockwool. Then do watering only when the planting media starts to look dry. After the seeds turn into sprouts, we move the seedlings along with the rockwool into 5-inch diameter pipes that have been perforated with a distance of 10 cm each.

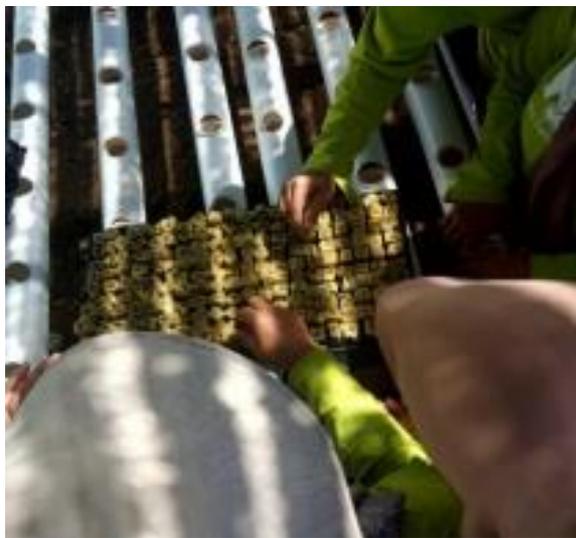


Figure 3. The kale seeds have germinated

Fertilizer. The planting medium in a hydroponic system only functions as a support for the roots and an intermediary for the nutrient solution. To meet the needs of macro and micro nutrients, it is necessary to fertilize in the form of a solution that is poured into the planting medium. The need for fertilizer in a hydroponic system is the same as the need for fertilizer in a conventional planting system.



Figure 4. Seedlings have leaves

Plant Care. Maintenance of a hydroponic system is basically not much different from maintenance of a conventional planting system, such as pruning, cleaning weeds, spraying fertilizer and leaves, etc.



Figure 5. Plant care

4. CONCLUSION

Planting plants using the hydroponic method in Calincing Village has had a very good impact on the village residents. Even though the agricultural land there is still relatively large, not all residents have empty land to grow crops. The use of the hydroponic method which saves space is certainly one of the solutions for them, especially the members of the Women Farmer Group (KWT) in Calincing Village. In addition to the various advantages of planting plants using hydroponic plants that have been mentioned, this method is also one of the important programs for the

continuity of KWT in Calingcing Village.

One of the main benefits of the hydroponic method is the ability to grow without soil. This allows villagers who have limited land or even no land at all to remain involved in agriculture. With hydroponics, they can grow plants indoors or in small containers, such as pots or shelves, instead of relying on traditional farm land.

With hydroponics, villagers can grow various types of plants such as vegetables, fruit and herbs efficiently. This can increase the availability of fresh and healthy food for their families. Hydroponic plants can also grow faster than plants in soil, so that the harvest can be enjoyed more quickly.

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