TRAINING ON MAKING HYDROPONIC PLANTS USING BOTTLES IN SAMBIREMBE VILLAGE

Riyana[1*]

[1] UIN Sunan Kalijaga, Yogyakarta
*20101050013@student.uin-suka.ac.id

Abstract *- Hydroponic farming has become an attractive alternative in facing the challenges of conventional agriculture in this modern era. By utilizing soilless techniques, this method provides a solution to limited land, efficient use of water, and optimal plant growth. The purpose of this training is to increase public awareness about the importance of managing used bottles as a hydroponic growing medium, and so that people have an interest in hydroponic farming. The method used is socialization, demonstration, and active discussion. As a result of this training, the participants were enthusiastic and actively participated in the training. The training process includes outreach about hydroponics, giving materials and hands-on practice.*

Keywords*: Hydroponics, Farming, Used Bottles*

1. INTRODUCTION

Hydroponic farming has become an attractive alternative in facing the challenges of conventional farming in this modern era. By utilizing soilless techniques, this method provides a solution to limited land, efficient use of water, and optimal plant growth. In an effort to increase knowledge and skills in modern agriculture, training on growing hydroponic plants using used bottles has been implemented, especially with PKK women. With this creative and inclusive approach, used bottles are turned into effective growing containers, providing an opportunity to grow plants in an environmentally friendly and economical way (Faizah dkk., 2020)

The word hydroponics comes from the Greek "hydro" which means water and "ponos" which means labor, so hydroponics means working with water. So hydroponics is a planting technique with non-soil growing media, which can be gravel, coarse sand, or coconut fiber. (Setiawan, t.t.). There are several types of plants that can be developed with hydroponic techniques, including kale, kailan, mustard greens, celery, lettuce, pakcoy, and spinach. Not only vegetables, fruit can also be cultivated using hydroponic techniques, including melons, watermelons and strawberries.

The hydroponic training activity with used bottles was carried out as one of the work programs carried out in real work lectures in the village of Sambirembe, Kalijambe District, Sragen Regency. This activity was carried out as an effort to increase the awareness of residents in reducing plastic bottle waste and utilizing it as a container for hydroponic plants. The use of bottles is also based on reduced land for planting and as an effort to increase public awareness about the importance of managing plastic bottle waste.

Used plastic bottles are materials that are usually easy to find around us. Often plastic waste becomes unused plastic waste, and by recycling it into hydroponic containers, we can reduce the impact of plastic waste. Utilizing used bottles as hydroponic containers is much more economical than buying special containers. This makes growing hydroponic plants more affordable for budget use.(Sugiarto & Kusuma, 2021). The use of bottles allows this training to teach creativity and innovation in utilizing materials that are around us. This utilization also provides an example of reducing plastic waste by recycling it.

The use of bottles in agriculture can help increase awareness of the importance of recycling and reduce the use of single-use plastics in society. Based on data from Kompas (2023) throughout 2022, there will be 69 million tons of waste produced by the people of Indonesia, of which 18.2 percent or 12.5 million tons is plastic waste. The effectiveness of used bottles as hydroponic containers depends on their proper planning and placement. The transparent walls of the bottle let in sunlight and direct it to the plant roots. The nutrient solution can be channeled through the neck of the

bottle. By cutting off the top of the bottle, we can provide sufficient space for the plants and roots to grow. Therefore, the method of hydroponic farming using bottles does not only focus on cultivating plants, but also raises public awareness of plastic bottle waste.

The purpose of this activity is to educate and provide understanding to the people of Sambirembe village, especially PKK women to actively participate in waste management so they can benefit from it. Reducing the use of plastic bottles around us, having a positive impact on the environment and also bringing added value to society, namely the opportunity to grow vegetables or fruit in the backyard with a hydroponic system is the main goal of this activity

2. METHOD

The training activity for making hydroponic plants using used bottles was carried out at a routine meeting of PKK women in Sambirembe Village, Kalijambe District, Sragen Regency, Central Java. The method used in this activity is socialization, demonstration of making hydroponics using bottles, and discussion. The description is as follows:

A. Socialization

In this socialization activity, namely by explaining an explanation of the introduction of hydroponics from used bottles, what are the advantages, and other explanations about hydroponics

B. Demonstration

The demonstration was carried out after the socialization activity about hydroponics. At this stage the participants did hands-on practice on how to grow hydroponically using bottles from the start of sowing the seeds to the procedure for caring for the seedlings when they were transferred to the hydroponic site.

C. Discussion session

The discussion session was carried out after the socialization and demonstration was carried out, participants were given the opportunity to ask questions regarding hydroponics and the material that had been presented.

3. RESULT AND DISCUSSION

The implementation of the activity was carried out during a routine meeting of PKK mothers in the village of Sambirembe. The implementation of the activity took place at the Sambirembe village hall. The results of the activity showed that the participants were very enthusiastic, willing to learn together, and tried to understand hydroponic planting training. Most of the participants did not know about hydroponic

farming, some of the participants had heard the term hydroponics, but all participants had never done this hydroponic planting.

The training activity begins with the socialization of hydroponic farming methods, namely by delivering material on hydroponic farming. Before delivering the material, we first asked about hydroponic farming to find out the level of knowledge of the participants on how to grow hydroponically using used bottles. From these results, only a small portion knows it.

After that the activity continued with the delivery of material and then showing a video about hydroponic farming. The material presented included the benefits of vegetables, the meaning of hydroponics, the benefits of hydroponic farming, various hydroponic growing media, and hydroponic farming methods. After delivering the material, a video was shown on how to grow hydroponically.

Figure 1. The process of delivering material about hydroponic farming

Furthermore, after conducting the socialization with the presentation of the material, then a direct demonstration was carried out on the procedures for hydroponic farming using bottles to the participants. During the demonstration the first thing to do was to introduce the tools and materials needed during the hydroponic farming process. The tools and materials needed are used mineral water bottles, cutter, flannel cloth, plant seeds, rock wool planting media, AB mix fertilizer nutrients, water. Then proceed with practice and active interaction with participants. During practice, we divided the participants into several groups to make it easier to practice and the participants could focus and understand the steps for hydroponic farming.

Picture 2. Demonstration process for making hydroponic plants

The first stage carried out is the seeding stage. Seeding is processing seeds into seedlings. This process was carried out because the seeds were too small to be planted, so they feared they would be carried away by water. In this process what is done is to put the seeds in a container filled with water until the seeds are submerged, then closed tightly. Store the container in black plastic and avoid sunlight, then wait for 1 day.

The next step is, after 1 day, open the container and prepare a cloth or tissue soaked in water. Put the seeds on a cloth or tissue using tweezers. Put the cloth or tissue that has the seeds back in the container and store it using black plastic. Then wait 1-2 days.

After the seeds sprout, transfer the seeds into the rock wool using tweezers. Rockwool growing media is used because it can hold water and air with a large capacity. Not only that, this planting medium can also help plants absorb nutrients properly. (Prakastiwi, 2021). Flush Rockwool using nutrients and then drying it under direct sunlight. Dry it every day and flush the rock wool media.

When the true leaves appear, the seedlings can be moved to a hydroponic place by making a wick system. The wick system is the simplest hydroponic system. The wick system utilizes capillary action so that water containing nutrients rises through the axis or cloth and hits the roots, so that the nutrients can be absorbed by the roots. (Isnan, 2020)At this stage the materials that need to be prepared are used bottles, cutter, and flannel. The first thing to do is cut the used bottle into two parts. The top of the bottle is used as a pot and the bottom is used as a container for nutrients. The bottle cap is perforated to be connected to the flannel cloth and as an axis channel for distributing nutrients to plant roots. After everything is ready, the plant is ready to be moved.

Once planted, then we only need to take care of it. For treatment only need to be watered with nutrients. The nutrients needed in hydroponics are known as AB mix. If the nutrients are in powder form, then the nutrients must first be dissolved to obtain

solution A and solution B. Then mix solutions A and B and mix them with clean water. The dose used is every 5 ml of solutions A and B mixed with 1 liter of water.

4. CONCLUSION

The training activities for making hydroponic plants that have been carried out have been well achieved, which can be seen from the enthusiasm and active role of the participants in participating in all series of activities. Based on the activities that were carried out, it was found that some of the participants did not know about hydroponic farming by using bottles as a planting medium. After participating in this activity, participants can get to know simple hydroponic farming techniques by using bottles. From this activity, it is hoped that participants will care more about the surrounding environment, namely by utilizing waste plastic bottles to become hydroponic growing media.

REFERENCE

Faizah, M., Nasirudin, M., & Prakasa, B. (2020). Pemanfaatan Pekarangan dengan Metode Tanam Hidroponik dari Botol Bekas. *Jumat Pertanian: Jurnal Pengabdian Masyarakat*, *1*(1), Article 1. https://www.kompas.com/properti/read/2023/06/15/180000421/sepanjang-tahun-2022-ada-12- 54-juta-ton-sampah-plastik-di-indonesia.

Isnan, M. (2020). *Hidroponik: Bertanam Sayuran Tanpa Tanah*. AgroMedia.

Prakastiwi, D. M. (2021). *Hidroponik: Strategi menanam di lahan yang sempit*. Elementa Agro Lestari.

Setiawan, A. (t.t.). *Buku Pintar Hidroponik*. LAKSANA.

Sugiarto, K., & Kusuma, V. A. (2021). PENYULUHAN PEMANFAATAN BOTOL AIR MINERAL BEKAS SEBAGAI MEDIA TANAM SAYURAN HIDROPONIK (HIDROBOKAS) DI KELURAHAN DAMAI BARU. *Seminar Nasional Pengabdian Kepada Masyarakat (SEPAKAT)*, *2*. https://journal.itk.ac.id/index.php/sepakat/article/view/534