

Conference Paper

## Effect of Organic Planting Media on the Growth of Purslane (*Portulaca oleracea* L.) Seedling

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### ABSTRACT

Purslane is an annual plant that has various benefits. This plant contains omega 3 which is equivalent to other types of vegetables. So far, purslane is still considered a weed, so it doesn't have a cultivation technique to get the results. This study aims to obtain a combination of planting media for the growth of purslane. This research is the beginning to increase the purslane omega 3 content. Because genetic factors and environmental conditions can affect the growth and development as well as the chemical content of plants. The experimental design used a completely randomized design (CRD). The planting media used were: soil, soil + husk charcoal, soil + compost, and soil + husk charcoal + compost. The treatment was repeated 4 times, so there are 12 observation units. Observations were made on the number of leaves and the number of branches. The results showed that the combination of soil+compost gave the best effect on the number of leaves and the number of branches of the purslane seedling

*Keywords: Purslane, Organic fertilizer, Growing media, Omega 3*

### Introduction

Purslane is an annual plant that is considered a weed. This plant has various benefits because of its nutritional content. Purslane has been known for a long time as a traditional medicine because it has various benefits. Purslane can be consumed directly or processed. This plant also contains high enough omega-3.

*Portulaca oleracea* can be eaten raw as a salad, cooked as a sauce in soups, or eaten as green vegetables. It provides a rich plant source of nutritional benefits (Uddin et al., 2020). The purslane plant has extraordinary nutritional properties. Purslane contains dietary minerals such as potassium, magnesium, calcium, phosphorus, iron, etc. Purslane also contains phytochemicals, vitamins, and minerals that are useful as antioxidants and are used in human health such as antibacterial, anti-inflammatory, antiseptic, and wound healing (Anggraeni et al., 2012).

Purslane has broad growing conditions. To be harvested in large quantities, it is necessary to provide suitable growing space. Seedling is the initial stage of plant cultivation, both vegetatively and generatively. To get good plant material, it needs a good planting medium. Commonly used plant media come from a mixture of soil and fertilizer. To support organic agricultural products, plant cultivation also needs to use organic materials. Fertilizers can come from various types found around us.

All of the plant species need optimal conditions environment for germination and seedling emergence (Vieira, 2010; Handayani & Yuzammi, 2019). The growing media should give good moisture and aeration. Moreover, the media structure should support root growth. Media has influenced the germination and establishment of the seedling growth supported (Handayani & Yuzammi, 2019).

#### How to cite:

Dewanti, F. D., Sukendah, Tarigan, P. L., & Koentjoro, Y. (2023). Effect of organic planting media on the growth of purslane (*Portulaca oleracea* L.) seedling. *Seminar Nasional Magsiter Agroteknologi 2022*. NST Proceedings. pages 30-33. doi: 10.11594/nstp.2023.3205

Soil is the most common medium used and as an ingredient in mixed media main crop. The condition of the growing media which includes physical, chemical, and biological properties affect crop yields (Nurlaila & Hendri, 2019). Organic material is derived from components of living organisms. Organic matter as a growing medium will undergo a weathering or decomposition process carried out by microorganisms from compost. This process produces carbon dioxide (CO<sup>2</sup>) water (H<sub>2</sub>O), and minerals. The resulting minerals are a source of essential nutrients that can be absorbed by plants as nutrients. In addition, the advantage of using Organic fertilizer derived from manure in the planting media is able to restore soil fertility through the improvement of soil properties, whether physical, chemical, or biological (Dalimoenthe, 2013).

Husk charcoal as one organic fertilizer is very useful to increase soil fertility and improve the structured soil. Utilization of husk charcoal as a medium for plant growth has the following benefits: (1) improves air circulation (aeration) and water (drainage), (2) neutralizes pH, and (3) nutrients are not easily washed out so that it is ready to be used for plants, and (4) husk charcoal has pores that are effective for bind and store nutrients (Irawan et al., 2020). Compost is the organic material residue derived from plant residues and animal waste that has undergone a decomposition process by microorganisms decomposers so that it can be used to improve soil properties. Compost also contains mineral nutrients that are essential for plants (Setyorini, 2003).

Purslane is easy to grow and develop in various types of land, so optimization growth can be done through the management of planting media. Good planting media will support seedling growth and produce superior planting material. The purpose of this study was to obtain a good mixture of planting media to support the growth of purslane seedlings. The results of the research are expected to contribute to the development of purslane as a cultivated plant.

### **Material and Methods**

This research was carried out in the experimental garden faculty of agriculture, UPN "Veteran" Jawa Timur. The method used is a completely randomized design (CRD). The treatment given was various mixtures of nursery planting media. The media mix consists of several factors: M0 (Soil) as control, M1 (Soil+ Husk charcoal), M2 (Soil+Compost), and M3 (Soil+ Husk charcoal+Compost). Media Mix using comparison 1:1. The planting material used is purslane cuttings. Cuttings are cut to 10 cm as planting material. Polybag used with a size of 42 x 25 cm.

The media mixed according to the treatment given. Each polybag planted 5 purslane cuttings. Watering is done every day, except when it rains. Besides that, shade is also used so that it is not too exposed to the sun. Shade with paranet 70% intensity used during the nursery.

### **Results and Discussion**

The observed data are the number of leaves and the number of branches. Observations are made every week to see the early growth of the nursery phase. Cuttings are part of vegetative propagation. The growth of leaves and branches is important at the early step. Figure 1. shows the number of purslane leaves. Different seedling media give different effects of purslane cutting. The result shows that there is a dynamic growth of purslane. The growth of leaves fluctuates, possibly due to environmental influences. Presumably caused by hot temperatures will cause plants to drop their leaves and further stunted growth. In the third week, a mix of soil and compost gives a higher result. This is also seen in the number of branch purslane cuttings in Figure 2.

The growth of branches results also shows the dynamic. In the third week media mix of soil and compost give a higher number of branches, The growth indicates that the media can support the purslane cutting to develop into the new plant. Compost as a media mix gives nutrients, moisture, and aeration. Compost support media to hold and provide the water.

Water is needed for all processes that occur in plants. Water is part of growth (photosynthesis); water is used to transport within the plant and to maintain cells bulging the plant. Ultimately water is

important for cooling the leaves. With water that is not enough, plants cannot absorb nutrients from their roots. Water is mainly absorbed by the roots. Therefore, the water balance around the roots is very important (Irawan et al., 2020).

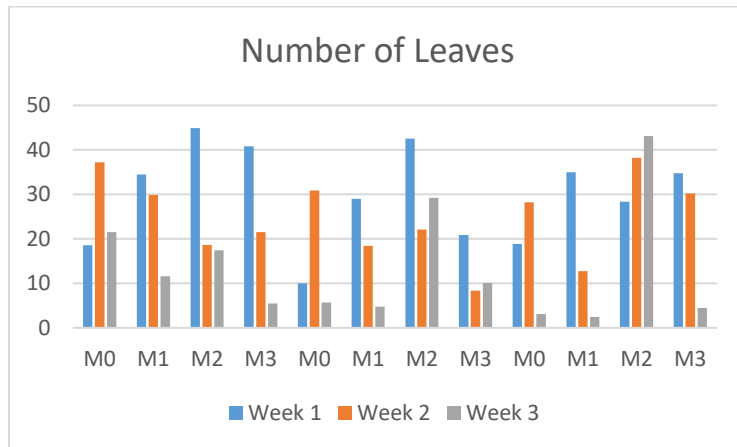


Figure 1. Number of leaves purslane cutting

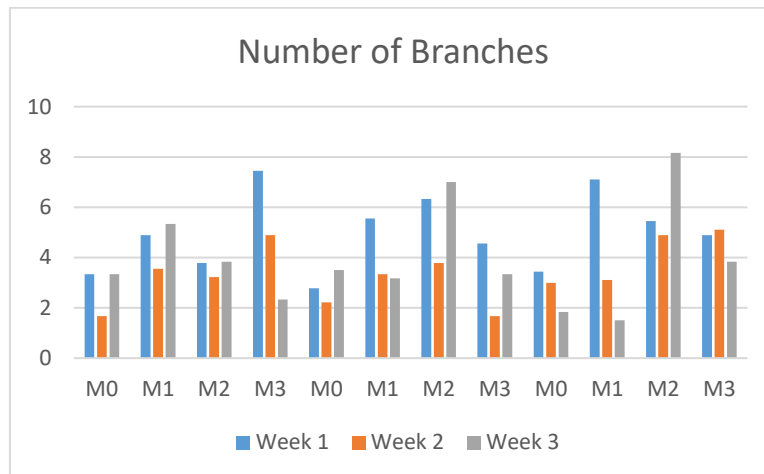


Figure 2. Number of branches purslane cutting

Purslane is spread plant and swarm over the ground surface. The branch is the growth purslane spread method. It tends to rise the branches from the main stem rather than elongating to form buds on the main stem. The leaves and roots grow in the new branches, so they will spread to the side of the ground surface.



Figure 3. Cutting in third week

This growth is most influenced by the growth media used. Media that has sufficient macro and micronutrients is a good medium for growth. Because nutrients can be taken from compost (Wardani et al., 2017). Compost will particularly improve the soil physical properties and improved soil aeration and drainage, and improvement of the physical properties of the soil will increase plant root growth (Kafrawi et al., 2018). Seedling media nutrient supporting growth and development purslane cutting. It is seen in the growth of leaves, branches, and the emergence of roots.

Seedling media will have a major effect on the quality of the cuttings generated. In large-scale production, the physical properties of the medium take precedence over its chemical properties (Adriana et al., 2014).

## Conclusion

The mix of soil and compost media gives the best result for the growth of purslane seedlings than other media. Seedling has a higher number of leaves and branches. This media is recommended for purslane seedling media.

## Acknowledgment

This work was financially supported by LPPM UPN “Veteran” Jawa Timur. The funded under Riset Dasar program 2022 year.

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