



Analysis of Red Onion Hydroponic Cultivation Case Study at Fresh Hydroponic MSMEs

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ABSTRACT

The purpose of the study is to find out the process of cultivating shallots using hydroponic techniques. The location of the study was conducted in Kedamean District, Gresik Regency, precisely Turirejo Village, which has fresh hydroponic Micro, Small and Medium Enterprises (MSMEs). The determination of the location of the study was carried out purposively, namely carried out on fresh hydroponic MSMEs with a business of cultivating shallot commodities hydroponically without using green houses or shade. The data used by researchers are primary and secondary data. The research method uses a descriptive method that uses survey methods, in-depth interviews and observations as data collection techniques. The results of the analysis of the hydroponic cultivation process of fresh hydroponic MSMEs are cultivating hydroponic shallots with the Nutrient Film Technique (NFT) system. It consists of 2 stages including, seedbed installation and enlargement installation. The cultivation process is carried out in an open place, namely the yard of the house or not using a greenhouse. The hydroponic cultivation process in fresh hydroponic MSMEs starts from the preparation of cultivation, the process of cultivating shallot hydroponics and post-harvest handling. Preparation for hydroponic cultivation of shallots includes capital, land, labor and saprodi. The next stage is in the cultivation process, including 1) Seeding seedlings, 2) Transplanting, 3) maintenance: (fertilization embroidery, watering, opt control) 4) Harvesting. Post-harvest handling in the hydroponic cultivation of shallots, namely withering and drying.

Keywords : Cultivation, Shallots, Hydroponics NFT, MSMEs.

1. INTRODUCTION

Shallots are a high-yielding horticultural crop and are widely cultivated by farmers. Shallots are commonly used for seasoning, food industry ingredients and traditional medicine, where the yield of shallot cultivation in Indonesia is still quite low. One of the causes of low shallot production is caused by cultivation that has not been maximized because cultivation is carried out seasonally (Permatasari et al., 2021). Shallots have been cultivated in annuals, so this makes the production and selling price of shallots fluctuate every year (Telaumbanua, 2022). The area of cultivation places is getting less and less, it requires updates to carry out cultivation, especially shallots, namely hydroponic techniques, so onion planting needs to utilize and optimize limited land and can be done throughout the year and does not depend on the season.

Micro, Small and Medium Enterprises (MSMEs) fresh hydroponics have cultivated shallots hydroponically. Hydraulic cultivation of shallots is carried out in order for controlled maintenance to obtain the desired production results. Hydroponic Technology is cultivation





without using soil and using water as a planting medium to distribute food substances to plants (Fabiola B. Assa, 2022). Plant development with Hydroponics has many benefits including: Freedom, Nutrition control is easy to do, planting results are better, Uniformity of cultivation results, quality of cultivation results may be better, the main points are cleanliness and safety of cultivation results, Save workers, it is not difficult to plant, there are almost no weeds (Aini, 2018). Unlike the hydroponic system that uses a green house and expensive equipment, in the installation of fresh hydroponic MSMEs, they cultivate shallot commodities hydroponically without using green houses or shade. Shadeless hydroponic cultivation is an innovation in hydroponic cultivation. Increasing shallot production by MSMEs fresh hydroponics innovates in the cultivation process such as planting shallots using hydroponics with the NFT (Nutrient Film Technique) system. NFT is a shallow water flow hydroponic system with a thin flow of nutrients to plant roots (film), with plant roots submerged in water that is circulated continuously using a pump and without using any plant media (Susilawati, 2019). The NFT system is very appropriate for beginners who want to cultivate because of its fundamental principle of utilizing water capilarity (Iskarlia, 2017). Another advantage of the NFT system is that it does not require special maintenance, is easy to assemble, can be moved, and is suitable on limited land (Primasari, 2021).

The onion cultivation process begins with seedbeds, cultivation land preparation, transplanting seedlings, maintenance, harvesting and post-harvest (Hermanto et al., 2017). The process of cultivating shallot hydroponics with the NFT system in MSMEs is expected to be able to cultivate onions all year round without paying attention to the season and utilizing the yard land more efficiently. This study aims to describe the process of the stages of cultivating shallots in the NFT system at MSMEs Fress Hydroponics, Kedamean District, Gresik Regency.

2. RESEARCH METHODS

The method used is the Descriptive research method, which is to describe the hydroponic cultivation of shallots in Fresh Hydroponic MSMEs. The determination of the location of the study was carried out purposively, namely on Fresh Hydroponic MSMEs with a business of cultivating shallot commodities hydroponically without using green houses or shade. The data used by researchers are primary and secondary data. The research method uses a descriptive method that uses survey methods, in-depth interviews and observations as data collection techniques. The results of the analysis of the hydroponic cultivation process of MSMEs in hydroponic fress start





from the preparation of cultivation. Informants or resource persons from the research conducted are farmers or owners of fresh hydroponic MSMEs.

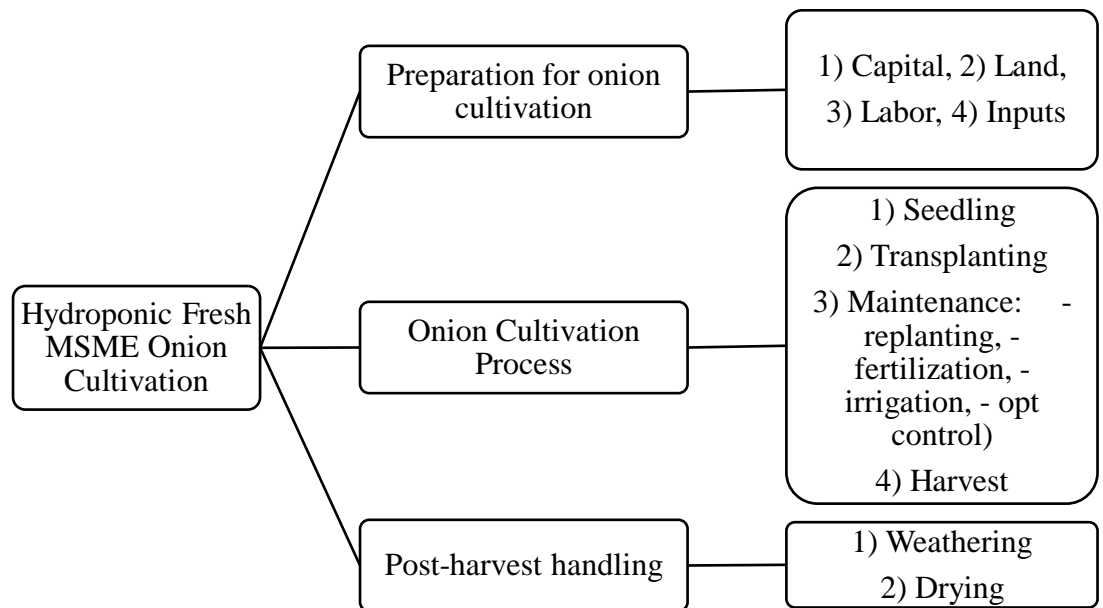
Data Collection Techniques using Survey and Observation Methods where to determine the Hydroponic Cultivation of Shallots from seed input to post-harvest The results of onion cultivation in fresh hydroponic MSMEs, in addition to in-depth interviews were conducted with farmers or business owners of fresh hydroponic MSMEs to find out the stages of shallot hydroponic cultivation. The data analysis techniques used, namely Miles and Huberman (1992: 20) describe the process of qualitative research data analysis, including: (1) analysis when collecting data, (2) data reduction, (3) data presentation, (4) drawing conclusions and verification.

3. RESULTS AND DISCUSSION

MSMEs Fresh Hydroponics cultivate shallots Hydroponic Nutrient Film Technique (NFT). It consists of 2 stages including, seedbed installation and enlargement installation. Similar to what was stated (Dewi Rosanti et al., 2019) in hydroponics of the NFT system, there are five stages, namely the preparation of the NFT series, seeding, nutrient preparation, plant transfer to installation and maintenance . There are 2 kinds of installations, namely seedbed installations for plants aged 1 to 8 hst and enlargement installations used for plants aged 9 to harvest crops. This fresh hydroponic MSME provides production support tools such as onion seeds, water reservoirs, water pumps, pest sprayers, seedbed plastic tubs, PH meters, TDS meters, flannel cloth, scissors, Netpot, Rockwool, knives, Water and Nutrients of AB MIX plants to carry out hydroponic cultivation of onion plants. As stated (Rochintaniawati, 2011) tools and materials in a simple hydroponic system, namely the type of plant to be planted, seedbed tray, jerry can, plastic container or pot, hand sprayer. The 3 stages are the Media Preparation stage, the seedbed stage, and the enlargement stage. Similar to what was stated (Suryani, 2022) the hydroponics program has 3 stages including seeding, seeding, enlargement, and harvesting stages. The cultivation process is carried out in an open place, namely the yard of the house or not using a greenhouse. Similar to what was stated (Athifa et al., 2019) innovation in the world of hydroponics because it does not use a greenhouse with an open environment or without a roof is dubbed the sky roof hydroponic garden.

The following is the process of hydroponic shallot cultivation with the NFT system:





Fresh hydroponic MSMEs have stages of shallot cultivation including:

Preparation for shallot hydroponic cultivation

1) Capital

Fresh hydroponic MSMEs in conducting onion hydroponics business require capital, where capital is an important thing in the form of money, goods, or so on that can be used in starting a business such as purchasing inputs in the form of purchasing seeds, financing labor, purchasing fertilizers or nutrients, purchasing agricultural medicines and in addition to the tools used in the cultivation of shallot hydroponics (Hariyadi et al., 2018). The capital used in the hydroponic cultivation of shallots is personal capital. As stated by (Wulandari, 2019) hydroponics in the form of small businesses, which is carried out by individuals and the business capital used by entrepreneurs is personal capital.

2) Land

The onion hydroponic cultivation land for fresh hydroponic MSMEs is their own land, where the cultivated land is the backyard of the house of the owner of the fresh hydroponic MSME himself. As stated (Waluyo et al., 2021) hydroponic systems are an alternative for people who have limited land or yards.

3) Labor

The labor used in carrying out the onion hydroponic cultivation business is labor from within one's own family. Similarly, what is stated (Lenny Windarti, 2020) creates jobs that help in overcoming unemployment, especially can be recruited from their own families.





4) Sapropdi

Sapropdi in the cultivation of shallot hydroponics in fresh hydroponic MSMEs such as seeds, fertilizers, agricultural medicines, as well as supporting tools such as Ph meters, TDS meters, hydroponic cultivation installations. Similar to what was stated (Wati & Sholihah, 2021) hydroponic installations need to know the pH value and nutrients require tools in the form of pH meters and TDS meters.



Figure 1. Sapropdi of shallot hydroponic cultivation MSME Fresh Hydroponics

Cultivation Process

1. Seeding

Media Preparation Stage

Prepare all materials used as planting media, such as rockwool, shallots that will be used as seeds to be seeded, Cutter and saw, water and hydroponic ab mix nutrients.

Onion Seedling Stages

Similar to what is stated (Fuada et al., 2023) the important stage for producing good plants is the seedbed stage. Stages of hydroponic shallot seedbeds in fresh hydroponic MSMEs:

Select old, dry and shiny seeds that have passed the 3-month dormancy period.

Onion seeds are cleaned and then, the tips are cut slightly using a cutter or scissors.

Onion seeds are cleaned and then, the ends are cut slightly using a cutter or scissors. Potong rockwool dengan ketebalan 2,5 cm kemudia bagi menjadi enam terus disiram dengan air bersih

Place the rockwool in the tray and wet it, then perforate the rockwool with a ballpoint pen.

After finishing the rockwool, each rockwool plant one shallot seed each.

When installed, store and place the seeds in a shady place, but still able to get sunlight.

After a few shallot stems emerge, move directly to the enlargement installation.

2. Transplanting





The transfer of plants from the seedbed process to the installation of hydroponic cultivation enlargement continued onion seedlings have been aged 1 week after planting, and roots have appeared on the rootstock and leaves have appeared. Similar to what was stated (Intan, 2019) the seeds that have grown are transferred to the netpot to be placed in the enlargement installation.

3. Maintenance

Replanting

Replanting is done because the shallot seedlings transplanted in the hydroponic cultivation enlargement installation do not thrive.

Onion Enlargement in Hydroponic Installation

The enlargement of shallot hydroponic cultivation can better observe how shallots become large until harvest. It is also advisable to check every 1-2 days to make sure that the water concentration at 1200 ppm and the pH at 5.5-6.5 has decreased or is still sufficient. If it turns out to be reduced, immediately add the nutrient concentrate and if the pH is above 6.5 add ph down to reduce the acidity of the water.

Pest control of plant diseases

Diseases that attack hydroponic shallot plants at Fresh Hydroponic MSME are:

Feather dew disease (*Peronospora destructor*)

- Fusarium wilt (*fusarium oxysporum*)
- Purple spot (*alternaria porri*)
- Onion Mosaic Virus (onion yellow dwarf virus)

To handle this, MSME Fresh Hydroponics uses Bio fungicides and fungicides with trademarks:

Anfus with active ingredients Gliocladium, Trichoderma, decomposing bacteria. How to apply it is by spraying and giving it directly to the pipe at the rate of 1 pipe and half a tablespoon.

2. Remazol-p with the active ingredient prochloraz (prochloraz) propiconazole (propiconazole) for how to use this fungicide, namely sprayed directly on the plant with a dose of remasol p 2 milli and dithane 1 tablespoon mixed into 5 liters of water and stirred for spraying if the plant is in a bad condition, it is done twice a day, namely in the afternoon, in the morning if it rains, spraying is also carried out to remove residual rainwater on the leaves as well so as not to be attacked by fungi, if the condition is healthy then spraying is done once in the morning to prevent plants from being attacked by pamur.

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Figure 2. Fungicides and biofungicides

a. Hydroponic shallot harvesting

How to harvest hydroponic shallots :

1. Harvesting is done simultaneously in all installations with the same plant age
2. Separate the shallots from the rockwool
3. put the shallots into a dry place and agin-agin until the shallots are all wilted.a

harvest and Post-harvest

As stated by (Rosliani & Sumarni, 2005) proper post-harvest handling will affect the quality of the crop. Post-harvest handling carried out by fresh hydroponic MSMEs includes:

1. Sunning

Onion leaf withering by drying the leaves to get red and shiny bulb skin (2-3 days) in direct sunlight. Then the bulbs are cleaned of soil and root debris, then tied for drying.

2. Drying

Drying shallot bulbs in direct sunlight (7-14 days) by turning every 2-3 days, ready for sale or long shelf life.

4. CONCLUSION

MSMEs Fresh Hydroponics cultivate Hydroponic shallots with a Nutrient Film Technique (NFT) system. It consists of 2 stages including, seedbed installation and enlargement installation. The cultivation process is carried out in an open place, namely the yard of the house or not using a





greenhouse. The hydroponic cultivation process in Micro, Small and Medium Enterprises (MSMEs) fresh hydroponics starts from the preparation of cultivation, the process of cultivating shallot hydroponic and post-harvest handling. Preparations for the hydroponic cultivation of shallots include Capital, Land, Labor and Saprod. The next stage is in the cultivation process, including 1) Seeding seedlings, 2) Transplanting, 3) maintenance: (fertilization embroidery, watering, opt control) 4) Harvesting. Post-harvest handling in the hydroponic cultivation of shallots, namely withering and drying.

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