

Plastic Window Pot: An Unique Planting Pot

Ahmad Yusri Amzar Yahana¹, Faybie Bungin Anak Freddie², Ahmad Wazif Ahmad Radzi³, Nur Ain Shazwani Mohamad Sairy⁴, Floryta Mohd Taha@Kit⁵, Selvakkumar K N Vaiappuri^{6*}, Wan Zuraida Wan Mohd Zain⁷, and Muhammad Nurudin Mohd Nor⁸

1. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; 2022786171@student.uitm.edu.my
2. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; 2022919889@student.uitm.edu.my
3. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; 2022792579@student.uitm.edu.my
4. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; 2022905479@student.uitm.edu.my
5. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; 2022974757@student.uitm.edu.my
6. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; selvakkumar@uitm.edu.my;
 0000-0002-8476-4424
7. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; wanzuraida@uitm.edu.my ;
 0000-0001-8133-9230
8. Faculty of Plantation and Agrotechnology. University Technology Mara, Malaysia; mnuruddin@uitm.edu.my ;
 0000-0001-7221-6271

* Correspondence: selvakkumar@uitm.edu.my; 06-2645298

Abstract: The Plastic Window Pot design emphasizes accessibility and ergonomics. It incorporates features such as built-in handles, detachable compartments, and a lightweight yet sturdy construction, allowing users and plant lovers to easily transport and manoeuvre the pot. The design also considers factors like soil drainage, ventilation, and space optimization to promote healthy plant growth and minimize damage during harvesting. Plant selection plays a crucial role in facilitating easy harvesting. The study investigates suitable plant species that exhibit desirable characteristics, such as compact growth habits, well-defined root structures, and centralized fruiting. By selecting plants with these attributes, farmers can achieve better accessibility and minimize the need for excessive digging or uprooting, thereby simplifying the harvest. Harvesting techniques are explored to optimize efficiency and minimize labour requirements. The study evaluates various methods, including selective harvesting, sequential harvesting, and mechanized tools to determine the most effective approach for several crops and plant types. These techniques aim to reduce manual effort, enhance speed, and maintain the quality of harvested produce. In conclusion, the development of an easy Plastic Window Pot encompasses thoughtful pot design, appropriate plant selection and efficient harvesting techniques. By integrating these elements, users can enjoy increased productivity, reduced effort, and improved overall convenience. For the home use aspects, this pot enables a satisfying gardening experience, leading to a bountiful harvest and the joy of cultivating plants in the comfort of one's own home.

Keywords: easy pot, harvest, homegrown potatoes



Copyright: © 2023 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. INTRODUCTION

We absolutely have no excuse when it comes to having no sweet potatoes available to eat. We can grow potatoes the no-dig way, grow sweet potatoes in laundry baskets and even grow sweet potatoes in upside-down buckets. As if those methods were not enough already, let's talk about this plastic window pot. This product focuses on creating a custom sweet potato pot that simplifies the maintenance and harvest process. The design involves using a large plastic pot with hinged windows that can be opened and closed. There will be 3 windows on each pot where the window is hinged to the main body of the pot and has locks to secure it.

2. METHOD & MATERIAL

2.1 *How to Make Plastic Window Pot*

2.1.1 *Choose a suitable-sized container.*

The size of the plastic window pot should be chosen by the consumer based on their space availability. It should be large enough to accommodate your plant's root system and allow space for the soil and tubers to grow.

2.1.2 *Creating a window on the pot.*

The side of the pot is trimmed with a plastic cutter to create a window on the sides. Cut the body of the pot to a square shape. There should be 3 total windows on the side of the pot.



Figure 1: Pot

2.1.3 *Prepare the window cover.*

Polyethylene terephthalate (PET) is the material used to create the window cover. Cut the PET into a desirable size of 3 pieces. This will be the window cover on the side of the pot.

2.1.4 *Install hinges.*

Then stainless-steel hinges should be installed to mount the PET windows on the side of the pot. Screw the hinges to the body of the pot and then screw the windows onto the hinges. There should be 3 hinges, 1 hinge for each window.



Figure 2: Hinge

3. HOW TO USE PLASTIC WINDOW POT

3.1 Prepare planting medium.

Place a layer of small rocks or gravel at the bottom of the container. This layer will aid in drainage and prevent soil from clogging the drainage holes. A mix with compost, sand, and a fertilizer high in potash is ideal. A good medium should be a well-draining potting mix and have good aeration. The medium should not be packed tightly as this can stunt the growth of the tubers.

3.2 Prepare sweet potato slips

Sweet potato slips can be prepared by the consumer or can be bought from local farmers. To prepare your potato slips, choose a mature, unblemished sweet potato. Organic varieties are generally preferred as they may have a higher chance of sprouting (Florini, 2015). Then it should be planted in a small potting mix (plastic bottles, containers etc) for it to sprout. After 3 weeks the slips should have sprouted for about 5-6 inches and can be transplanted into the plastic window pot.

3.3 Provide Adequate Water and Sunlight

Water the plants regularly, keeping the soil evenly moist but not waterlogged. Sweet potatoes require consistent moisture to develop properly. Place the container in a sunny location where the plants can receive at least six to eight hours of direct sunlight daily.

3.4 Monitor and Maintain

Keep an eye on the plants to ensure they are healthy. Remove any weeds that may compete for nutrients and water. Fertilize the plants as needed, following the instructions for a balanced fertilizer suitable for root crops.

3.5 Harvesting

When the sweet potatoes are ready for harvest, simply open the side clear plastic glass panel carefully to expose the tubers. Gently remove the tubers from the soil, being careful not to damage them. Allow the harvested sweet potatoes to dry for a few hours before storing them in a cool, dry place.

4. MATERIALS

The main material used is polyethylene terephthalate (PET) because it is strong and lightweight. The main body of the pot is made from PET and the 3 windows on the side are also made from PET. The hinges and the lock of the window are made from aluminium and steel to ensure it can secure the window from opening easily.

5. FINDINGS

5.1 Problem Statements

Farmers and gardeners often face challenges when it comes to harvesting crops efficiently and effectively. The current methods of manually harvesting plants are time-consuming, labour-intensive, and prone to errors. This inefficiency can lead to increased costs, reduced productivity, and potential crop loss. Therefore, there is a need for a solution that simplifies the harvest process, making it easier, faster, and more reliable for farmers and gardeners. The Plastic window pot aims to revolutionize the traditional manual harvest methods and provide a reliable solution that simplifies the harvesting process, making it easier, more efficient, and cost-effective for agricultural professionals. Planting sweet potatoes indoors can also affect the quality of the crops where potted plants and fewer nutrients than outdoor plants (Dongre, 2017). This can reduce the sweetness of the potatoes. To overcome this problem, the roots of the crop should be pruned to have 5 tubers maximum. Limiting the number of tubers in each pot will help the nutrients of the potting mix to spread efficiently and produces high-quality sweet potatoes.

6. ADVANTAGES

1. Easy harvest

We consider attaching hinges or adding 3 holes or windows on side of the pot and a removable side clear plastic glass panel to the container. This will allow the consumer to access the tubers easily when it's time to harvest. Alternatively, consumers will be offered a container that has a flexible or collapsible design that can be unfolded or opened to release the soil and tubers.

2. Easy root pruning

This pot has windows on each side, so it will help the gardeners to prune their plant. So, it helps promote fruit growth. This action will create a better rooting system that will supply all the necessary ingredients to the plant.

3. Easy to relocate.

With this pot we can decide when and how your plant gets sunlight, shade and water. Unlike the natural method which the plant has adapted the condition of the weather.

4. Saves spaces.

It will save spaces because we can arrange it according to our area. We also can put the pot near to each other and it will not affect the plant because the plant does not compete each other.

5. Highly durable than clay pot

This pot is made of high quality plastic, so it does not crack easily. Unlike the clay pots, these pots are not absorbent. It does not absorb water and work well under harsh sunlight. This pot also maintains the temperature of the soil.

6. Easy to retain moisture.

These pots can retain moisture. Means that the plant does not need to be watered every day. It is particularly helpful for sweet potato because it required a constant supply of moisture.

7. COSTING

Table 1: Cost

Item	Price (RM)
Medium size plastic pot	RM 5.00
Plastic glass sheet (30cm x 30cm x0.4cm)	RM 3.50
Amount of items required to produce 1 Plastic Window Pot: 1 medium size plastic pot 3 plastic glass sheets Total cost: RM 15.50 Market Price: RM 20.00	

To conclude, the cost to make 1 Plastic Window Pot is RM 15.50 and the market price is RM 20.00. The average price for a high-quality plastic pot in the market is RM 15.00. By just adding only RM 5.00, the buyers could get the advanced designed, easily used, decoration purposed and high-quality pot which is 4 in 1. So definitely, our product has advantages and a positive possibility to compete in the market.

8. DISCUSSION

The plastic window pot has commercial value in the gardening and agricultural industry. The demand for container gardening solutions is growing, particularly in urban areas where space is limited. The plastic window pot offers a convenient and practical way for gardeners to grow sweetpotatoes and other root vegetables in a compact and manageable space.

Additionally, the plastic window pot is a product that can be marketed to people who have limited mobility or physical limitations that make traditional gardening difficult. The container's easy harvest design makes it accessible to individuals who cannot bend down to harvest their crops from the ground.

The plastic window pot can also appeal to commercial growers who are looking for a way to increase their yields and reduce labour costs. The container's compact size and portability make it easy to move the plants to different locations to optimize sunlight and soil conditions. The container's easy harvest design can also reduce the time and labour required for harvesting crops, making it an attractive option for commercial growers.

Furthermore, the plastic window pot can be marketed as an eco-friendly option for growing food. By using a container, gardeners can conserve water, reduce the use of pesticides and herbicides, and minimize soil erosion (Dongre, 2017). As sustainability becomes an increasingly important concern for consumers, the eco-friendliness of the plastic window pot can be a significant selling point.

In summary, the plastic window pot has commercial value in the gardening and agricultural industry. Its convenience, accessibility, and eco-friendliness make it an attractive option for home gardeners, commercial growers, and environmentally conscious consumers alike.

9. CONCLUSION

To conclude, the plastic window pot is made of polyethene terephthalate (PET) because it is strong and lightweight. It contains 3 windows on the side with openable windows with hinges and locks. The revolutionary design has a lot of advantages which are easy harvest, easy root pruning, easy to relocate, saving spaces, and high durability.

The plastic window pot can help many farmers that want to try to plant sweet potatoes without land. These pots are targeted at people that are living in urban areas or apartments which have little to no access to soil or planting lands. This innovation will help these people to produce their own food sustainably. The Malaysian government nowadays promotes self-sustainability to produce and plant their own food with the current problems of the economy. This can help to reduce poverty in urban areas (Dash, 2019).

Acknowledgements: The authors would like to express their gratitude to the Faculty of Plantation and Agrotechnology, UiTM Campus Jasin for the encouragement to participate in the innovation competition.

References

- Florini, D. A., & Loria, R. (2015). Reproduction of *Pratylenchus penetrans* on potato and crops grown in rotation with potato. *Journal of Nematology*, 22(1), 106.
- Dongre, A. U., Battase, R., Dudhale, S., Patil, V. R., & Chavan, D. (2017). Development of potato harvesting model. *International Research Journal of Engineering and Technology (IRJET)*, 4(10), 1567-1570.
- Dash, S. K., & Rayaguru, K. (2019). Post-harvest processing and utilization of sweet potato: A review.