

Research Article

Cowdung Seedling Tray: A Planting Experiment With Enhanced Value

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Abstract: The cowdung seedling tray is a sustainable and cost-effective solution for household seedling cultivation. Made from cow dung, it offers an eco-friendly alternative to plastic trays, reducing waste and harmful chemicals. Its organic composition enhances plant growth, reducing the need for synthetic fertilizers and saving costs. The tray's versatility makes it suitable for households, allowing individuals to grow their plants and herbs, promoting self-sufficiency and fresh produce. Its biodegradability simplifies gardening by eliminating the need for transplanting, saving time and effort. The cowdung seedling tray provides a natural and nutrient-rich environment, resulting in healthy plant growth and high-quality produce. It is also an affordable option, reducing expenses associated with plastic trays and synthetic fertilizers. Overall, the cowdung seedling tray offers a sustainable and accessible solution for households, empowering individuals to embrace gardening, reduce their environmental impact, and enjoy the benefits of home-grown, fresh produce.

Keywords: Cost-effective, eco-friendly, organic composition, costs saving, biodegradability.



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1. INTRODUCTION

The cowdung seedling tray is an innovative solution that has gained considerable attention due to its potential economic, financial, and environmental benefits. In an era marked by increasing concerns over plastic waste, the cowdung seedling tray offers a sustainable alternative that addresses these pressing issues (reNature,23). This environmentally friendly tray, made from cow dung, not only reduces plastic waste but also presents economic advantages and financial savings for various industries. Additionally, its adoption aligns with the growing demand for sustainable practices, which has garnered significant media attention in recent years.

In terms of the economy and finances, the cowdung seedling tray provides a cost-effective solution by utilizing cow dung, an abundant and renewable resource. By repurposing cow dung into a valuable material for seedling cultivation, it reduces the expenses associated with purchasing plastic trays and synthetic fertilizer. This not only contributes to financial savings for businesses and individuals but also opens up new income streams by transforming a traditionally discarded resource into a valuable commodity (BIOGROW,23).

Furthermore, the cowdung seedling tray addresses pressing environmental concerns. Plastic waste, especially in the form of single-use trays, has become a major issue highlighted by the media (UNEP, 2021). The cowdung seedling tray offers an eco-friendly alternative that reduces plastic waste and minimizes the harmful environmental impact associated with conventional plastic trays. It is biodegradable and free from harmful chemicals, providing a sustainable option for seedling cultivation that aligns with the growing demand for greener practices.

As sustainability and environmental consciousness have gained significant media attention, the adoption of the cowdung seedling tray represents a positive response to these concerns. Media outlets have highlighted the damaging effects of plastic waste and the urgent need for sustainable alternatives. The cowdung seedling tray serves as an innovative solution that addresses these issues, garnering attention and promoting eco-friendly practices.

2. METHOD & MATERIAL

Preparation of Cow Dung:

To begin, collect fresh cow dung and allow it to partially dry. It should retain some moisture but be firm enough to maintain its shape. Drying the cow dung helps remove excess moisture, making it easier to handle during the tray-making process.

Adding Binding Materials:

To enhance the hardness and water resistance of the seed tray, mix the cow dung with binding materials such as egg net and eggshell. These materials help hold the cow dung together and provide structural support, improving the overall quality of the seedling tray.

Thorough Mixing:

In a mixing container or on a clean surface, thoroughly combine the partially dried cow dung and the binding materials. Knead and mix the materials until they are well-blended. Adjust the moisture content if necessary by adding small amounts of water or additional cow dung to achieve the desired consistency.

Shaping the Seed Tray:

Take a portion of the mixture and firmly press it into the desired shape of a seed tray. Create a solid and compact base with raised edges to hold the soil and seeds effectively. Smooth the surface to ensure the tray is even and uniform in shape.

Drying and Hardening:

Place the newly formed seed trays in a dry and well-ventilated area to allow them to dry and harden. This process may take several days or up to a week, depending on the moisture content and environmental conditions. It is important to ensure that both the top and bottom surfaces of the seed trays are exposed to air for even drying.

Optional Surface Treatment:

Once the seed trays are completely dry, you have the option to apply a natural sealant or water-resistant coating to the surface. Palm wax can provide additional water resistance and protection. Follow the instructions provided by the manufacturer when applying the sealant.

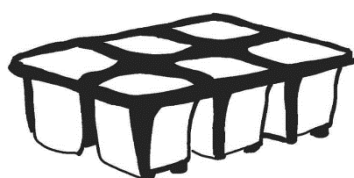


Figure 1: Prototype of cowdung seedling tray.



Figure 2: Method of separating seedling tray into one compartment.



Figure 4: Example of separated compartments.

3. FINDINGS

3.1 Problem Statement

Plastic seed trays contribute to plastic waste and pollution. They are made from non-biodegradable materials derived from fossil fuels, which take hundreds of years to decompose. Improper disposal of plastic seed trays can lead to environmental pollution, harming ecosystems, and wildlife.

Plastic seedling trays typically have a high cost of making. Plastic trays are mass-produced and require specialized manufacturing processes, which contribute to their higher price. In addition, transferring seedlings from trays to the garden or larger pots can sometimes cause transplant shock (Robin Schmitz, 2017). The roots of seedlings grown in trays may become more intertwined, making it challenging to separate and transplant them without disturbing their delicate root systems.

3.2 Solution

Cow Dung seedling tray is an innovation to reduce plastic usage by using non-plastic materials like eggshell, egg tray and cow dung itself with the same function as the plastic seed tray.

The plastic seedling tray is cheap if bought wholesale but not in per tray. Compared to cow dung trays the price is cheaper if bought per tray since the product is DIY and not facing any manufacturing process. In addition, cow dung seedling tray also provides necessary nutrients like nitrogen, phosphorus, potassium and carbon (Beef Cattle Research Council, 2023) that are essential for plant growth. Finally, cowdung seedling tray can avoid transplant shock when the user can break the compartment and plant the tray directly. Our seed starter kits are suitable for flowers, herbs, vegetables, fruits and other plants. They can be used in gardens, greenhouses, indoors and outdoors which provides great convenience for planting.

3.3 Impact

As a result, crops will have a better environment with low agricultural waste, especially non-biodegradable waste. Households can buy products in small amounts of cow dung seedling trays, on the other hand, are often made from readily available and low-cost materials, making them a more economical option. Nutrients in cow dung can replace peat moss use since it can provide essential nutrients for plant growth and development which is suitable for seed germination.

3.4 Commercialize Potential

With the rise in indoor and urban gardening, more households are looking for convenient and space-efficient solutions for starting seeds and growing plants indoors. Cow dung seedling trays can cater to this market by providing a sustainable option that is suitable for indoor use and fits well within limited spaces.

Commercialising cow dung seedling trays offers an opportunity for branding and product differentiation. Emphasizing the natural and sustainable aspects of the trays, highlighting their biodegradability and eco-friendliness, can create a unique selling proposition and attract customers looking for alternative options in the market.

3.5 Price Comparison

TABLE 1.0: Costs

Item	Price	Plastic Seedling Tray (6holes)
Cow dung	RM 3 / 10kg	Market price: Rm 10/tray
Egg net	RM 0.28 / tray	
Eggshell	RM 8 / kg	
Palm wax	RM 20 / kg	
The amount required to make one tray of cowdung seedling tray: - Cow dung 1kg Egg net 2 tray Eggshell 200g Palm wax 100g Total Cost; $RM\ 0.3 + RM\ 0.56 + RM\ 1.60 + RM\ 2 = RM\ 4.46$ Market Price: RM 6		

Based on Table 1: To conclude, the cost to make one cowdung seedling tray is RM4.46, and we can sell at a market price of RM 6-8

Compared to the plastic seedling tray, we can assume it's costing around RM 7-8 since the market price is RM10.

4. DISCUSSION

Cow dung seed trays are also relatively inexpensive and easy to make. They can be made using locally available materials, and the process of making them requires minimal energy. In addition, the use of cow dung seed trays helps to reduce the amount of waste generated from plastic seed trays, which can have a significant impact on the environment.

Another advantage of using cow dung seed trays is that they can help to promote plant growth. Cow dung contains high levels of nitrogen, phosphorus, and potassium, which are essential nutrients for plant growth. When seeds are planted in cow dung seed trays, they are exposed to these nutrients, which can help to accelerate their growth and development.

5. CONCLUSION

In conclusion, the cowdung seedling tray offers numerous benefits to households in terms of the economy, finances, and the environment. Economically, it provides a cost-effective solution by utilizing cow dung, eliminating the need for purchasing plastic trays and synthetic fertilizers, resulting in financial savings for households engaged in gardening, a renewable resource, and reducing expenses for farmers, nurseries, and agricultural businesses. Financially, it creates an additional income stream by monetizing a resource that would otherwise be discarded. Additionally, the tray promotes self-sufficiency by enabling households to grow their plants, vegetables, and herbs, ensuring a fresh and readily available supply of products while reducing reliance on store-bought items. Environmentally, the cowdung seedling tray reduces plastic waste and harmful chemicals, aligning with sustainable practices within households. By adopting cowdung seedling trays, households can embrace an eco-friendlier lifestyle, save money, and enjoy the benefits of home-grown, fresh produce.

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.

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