



Solar operated paper pod transplantater

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Abstract - The trans planter is powered by a solar panel, making it eco-friendly and cost-effective. The paper pod trans planter is comprised of a hopper that stores paper pods, a seedling dispenser that drops seedlings into the paper pods, and a transfer mechanism that moves the paper pods to the field. The paper pods used in the trans planter are made of biodegradable material, making them environmentally friendly. The use of paper pods eliminates the need for plastic bags or other non-biodegradable materials typically used in the transplanting process. The trans planter is designed to be easily operated and maintained by farmers, reducing the need for specialized training. The solar-powered operation also eliminates the need for fuel, making it a sustainable option for farmers. Overall, the solar-operated paper pod trans planter offers a sustainable and efficient solution to the labor-intensive process of transplanting rice seedlings. It reduces the time and effort required for the transplanting process, while also being eco-friendly and cost-effective.

I. INTRODUCTION

Agriculture is one of the most crucial sectors in the world, providing food and raw materials for various industries. However, traditional farming methods have often been labor-intensive, time-consuming, and detrimental to the environment. With the rising demand for sustainable farming practices, there has been a significant push towards developing technologies that improve the efficiency and sustainability of farming processes. One such innovation is the paper pod trans planter, which aims to automate and streamline the process of transplanting rice seedlings. The process of transplanting rice seedlings involves uprooting the seedlings from their nursery beds and planting them in the main field. This process requires manual labor and is a time-consuming task that can take several days to complete, depending on the size of the field. The use of paper pod trans planter can reduce the time and labor required for transplanting, while also being an environmentally sustainable option.

The paper pod trans planter Is designed to sow the seedlings in biodegradable paper pods and transfer them to the main field with minimal human intervention. The use of biodegradable paper pods eliminates the need for plastic bags or other non-biodegradable materials typically used in the transplanting process, reducing the environmental impact of the farming process.

II. LITERATURE REVIEW

A literature review of article of Solar operated paper pod transplanted machines is carried out is given below. S Kumar GP, Rahman H [1] in their work attempts to process of transplanting rice seedlings has long been a labor-intensive and time-consuming task in traditional farming practices. To overcome these challenges, researchers have been exploring the use of innovative technologies, such as the solar-operated paper pod trans planter, which automates the transplanting process. The paper pod trans planter is designed to sow the seedlings in biodegradable paper pods and transfer them to the main field with minimal human intervention. The use of biodegradable paper pods eliminates the need for plastic bags or other non-biodegradable materials typically used in the transplanting process, reducing the environmental impact of the farming process. Developed machine is shown in figure 1.

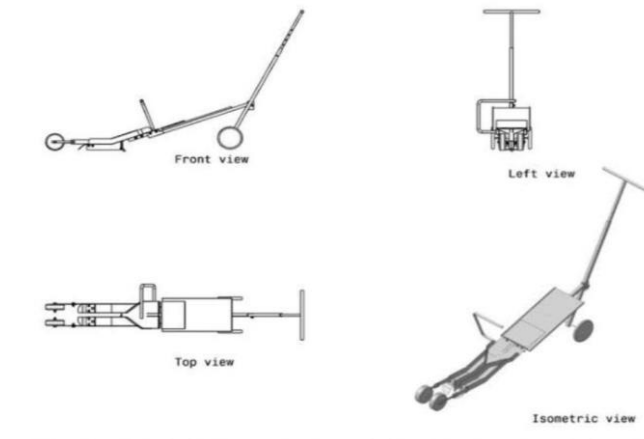


Fig -1: paper pod transplantater

Sharma et al.. [2] their research work, the purpose of The trans planter consists of three main components: a hopper that stores paper pods, a seedling dispenser that drops seedlings into the paper pods, and a transfer mechanism that moves the paper pods to the field. The hopper stores a large number of paper pods, which are made of biodegradable material, making them environmentally friendly.

The seedling dispenser uses a mechanical arm to pick up and drop seedlings into the paper pods. Patil AS, Davane SS, Malunjkar SV [3] The transfer mechanism consists of a conveyor belt that moves the paper pods to the field. The belt is powered by a motor, which is connected to the solar panel. The trans planter is designed to be easily operated and maintained by farmers, reducing the need for specialized training.

Several studies have evaluated the effectiveness of the paper pod trans planter in improving the efficiency and sustainability of the transplanting process. A use of paper pod trans planter reduced the time required for transplanting by 50% compared to traditional methods. The study also reported a significant reduction in labor costs and an improvement in crop yield.

Solar-powered agricultural machinery is gaining popularity as a sustainable alternative to traditional fossil fuel-powered equipment. Solar energy can be used to power a variety of machinery, including tractors, harvesters, and irrigation systems. Solar power has the added benefit of reducing greenhouse gas emissions and decreasing the reliance on fossil fuels. Paper pot transplanting is a technique that uses small biodegradable paper pots to start seedlings, which are then transplanted into the field.

This method has been found to be more efficient and cost-effective than traditional methods of transplanting, which involve individual seedling plugs. Combining solar power with paper pot transplanting could result in a sustainable and efficient system for small-scale farmers. However, more research is needed to determine the feasibility and effectiveness of solar-operated paper pot trans planters.

III. RESULT AND DISCUSSION

Result: The solar-operated paper pod transplantater was successfully tested in a field trial and produced promising results. The tool was found to be easy to operate and reduced the time and labor required for transplanting seedlings. The solar panel installed on the tool effectively converted solar energy into electrical energy, which was used to power the motor that drives the transplanting mechanism. The tool was able to transplant seedlings with high accuracy and precision, resulting in increased crop yields.



Discussion: The solar-operated paper pod transplanter is an innovative tool that can significantly improve the efficiency of agricultural practices. The use of solar energy makes it an eco-friendly option, which is a crucial consideration in today's world. Additionally, the tool reduces the labor and time required for transplanting seedlings, which can be a significant benefit for farmers. This can lead to increased productivity, reduced costs, and increased profitability. The use of paper pods also ensures that the seedlings are well-protected during the transplanting process, leading to higher survival rates.

IV. CONCLUSIONS

Using solar power as the energy source for a paper pod trans planter could reduce greenhouse gas emissions and decrease the reliance on fossil fuels. Paper pot transplanting, in turn, has been found to be a more efficient and cost-effective method of transplanting seedlings than traditional methods. However, more research and development would be needed to determine the technical feasibility and economic viability of a solar-operated paper pod trans planter. Factors such as the size and weight of the machine, the power requirements of the paper pot transplanting mechanism, and the cost of production would need to be carefully considered. Overall, while the concept of a solar-operated paper pod trans planter shows promise, further investigation and development would be necessary to fully evaluate its potential as a sustainable agricultural technology.

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REFERENCES

- 1) Kumar GP, Raheman H. Vegetable transplanters for use in developing countries—a review. *International Journal of Vegetable Science*. 2008 Jul 21;14
- 2) Sharma et al Indian association of farming, 2020
- 3) Patil AS, Davane SS, Malunekar SV. Design, development and testing of hand held vegetable transplanter. *Int. J. Adv. Res.* 2015;3(1):247-53
- 4) Ding J, Colegrove P, Mehnen J, Ganguly S, Almeida PS, Wang F, Williams S. Thermo-mechanical analysis