

# ONION HARVESTING DRIVE

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## **Keywords:**

Onion harvesting, Labor efficiency, Agricultural technology, Farming equipment

## **Introduction:**

In India Onion is one of the most important crops, approximately on 254.73 lakh tons onion is planted every year.

### ❖MANUAL ONION HARVESTING:

- Manual onion harvesting involves the process of manually pulling out onions from the soil once they have matured.
- To know when to harvest onion bulbs, look for signs where the tops start to yellow and flop over entirely at the neck of the onion plant.
- You can then pull out the mature onions and let them dry on a screen under a covered porch.
- If the rest of the onions leaves of the same variety haven't fallen down naturally within a week or two, you can pull them out of the soil and dry them without bending over the leaves.

### ❖ONION HARVESTING DRIVE:

- Onion harvesting vehicles are specialized machines used to efficiently harvest onions.
- Onion harvesting requires efficient and labor-saving methods to ensure timely harvest and minimize losses. Onion harvesting vehicles play a crucial role in streamlining this process by automating the harvesting tasks, leading to increased productivity and reduced labor costs.
- The process involves using self-driving with specialized machines such as trimmer, digger, conveyor belt, and storage unit.
- Mechanization reduces unit cost of the production through higher productivity.

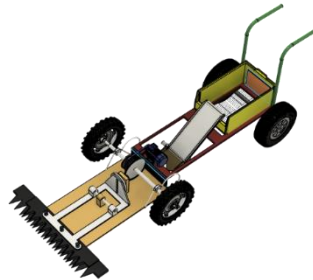
## Objectives of the project:

- Harvesting of onions from agricultural field.
- To cut the leaf of the onion and to convert leaves into organic manure
- Digging the onion from ground using suitable mechanism and collecting in storage tank
- To reduce harvesting time and money.
- Minimize the cost and increase the profit of farmers
- Operate the machine in the forward direction.

## THE STEPS INVOLVED IN FABRICATION OF ONION HARVESTING DRIVE.

### 1. Conceptual Design

- **Preliminary Sketches:** Create initial design using a designing software fusion 360 and Auto-Cad

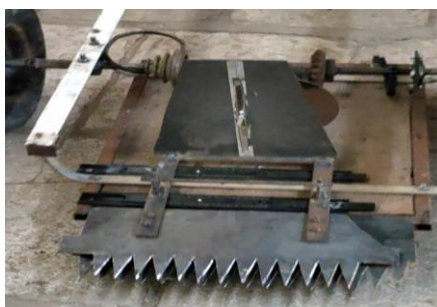


### 2. Prototyping

- **Prototype Fabrication:** Assemble a working prototype using selected materials. This involves welding the frame, make trimmer mechanism, and digger mechanism, installing the belt drive, chain and sprocket, and conveyor belt system.

### 3. Mechanism working system

- **Trimmer system:** A trimmer mechanism uses a reciprocating motion to cut or trim the leaf. It has two sets of blades that move relative to each other to create cutting zones. One blade oscillates quickly while the other stays fixed, causing a sliding action that cuts leaf trapped between the blades. The blades are sharp enough to cut the leaf off the onion bulb without pulling onion out from the ground or causing damage.



## Trimmer system

- **Digger system:** An onion digger system loosens the soil and digs out the onion bulb without damaging it. The system includes a blade that digs out the onion and lifts it, and transports it to on a conveyor belt which transport in to the storage unit.



**Digger system**

## Working: -

onion harvesting drive is based on the EV concept using a motor of 750W and a power source of 48V batteries are connected in a series i.e. 12\*4. The motor is connected to front axis with chain and sprocket system which drive the entire vehicle. The front axis having a bevel gear setup to transmitting the power to the trimmer mechanism and also to move the vehicle in forward direction. The digger system having a threaded screw which will help to make adjusting the digger plate. From the front axis using a gear system and using pulleys system the power is to be transmitted to conveyor belt to transfer the onion bulb into the storage unit. The storage unit is made up of metal wire mesh which use for removing the soil which comes the with the onion while harvesting

## Results and Conclusion:

The onion harvesting drive has been a resounding success, achieving its objectives of

- Increasing productivity
- Improving onion quality
- Reducing labour requirement
- Ensuring timeliness and efficiency
- Reduced operating costs
- Increased revenue from higher quality onions
- Improved competitiveness in the global market
- As the onion industry continues to grow and evolve, onion harvesting vehicles will play an increasingly important role in ensuring the efficient and sustainable production of onions. By embracing mechanization and innovation, farmers can

meet the growing demand for onions while maintaining high quality and profitability.

**Conclusion:**

The development and fabrication of a bicycle-powered water purifying system represent a significant advancement in providing sustainable and accessible clean water solutions, particularly for rural and remote areas. Based on the results the purified water is suitable for drinking purpose

**Innovation in the project:**

Manual harvesting needs more man power and it consume more time. but in this onion harvesting driver we are converting electrical; power into mechanical operating vehicle to reduce time and cost of the onion harvesting and also reduce the man power and easy to operate the vehicle.

**Future scope:**

This project is further integrated with given ideals

1. solar panels as a power source, the generated energy is stored in batteries. Which is used to run the vehicle
2. It can be controlled by IOT to give the direction for vehicle moment and mechanism also