



## FABRICATION OF MULTIPURPOSE AGRICULTURE MACHINE

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**Abstract:** India is an agriculture based country in which, 70% of people depends on the outcome of farming. But if we observe that with increase in population the farm gets distributed among the family and because of this, farmer in India held averagely only two acre farm. Also economically, farmers are very poor due to which they are unable to purchase tractors and other costly equipment's hence they use traditional method of farming. Basically, many farmers in India also use bullocks, horses and he-buffalo for farming operation. This will not satisfy need of energy requirement of the farming as compared to other countries in the world. Human and animal efforts can be replaced by some advance mechanization which will be suitable for small scale farmer from economical and effort point of view. Fabrication of multipurpose agriculture machine will satisfy all this need and to solve labour problem. This machine performs five farming operations like Grass cutting, Tilling, seed sowing, spraying and surface leveling. By using above attachments one may perform various farming operations in less time and economically.

**KEYWORDS:** Multipurpose Agriculture Machine, Farmers, Farming operations.

### INTRODUCTION

Agriculture is the art and science of cultivating the soil, growing crops and raising livestock. It includes the preparation of plant and animal products for people to use and their distribution to markets. Agriculture provides most of the world's food and fabrics. Cotton, wool, and leather are all agricultural products. Agriculture also provides wood for construction and paper products. These products, as well as the agricultural methods used, may vary from one part of the world to another. Before agriculture became widespread, people spent most of their lives searching for food—hunting wild animals and

gathering wild plants. About 11,500 years ago, people gradually learned how to grow cereal and root crops, and settled down to a life based on farming. By 2,000 years ago, much of Earth's population had become dependent on agriculture. Scholars are not sure why this shift to farming took place, but it may have occurred because of climate change.

### LITERATURE REVIEW

Mr. Thange R.B, Mr. Ugale A.G et al. (2016): The author studied and developed agricultural needs to find new ways to improve efficiency. One approach is to utilize available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Here author is trying to make such an equipment that will perform no. of operations like sowing, weeding, grass cutting, tillage, spraying, etc.

Nagesh Adalinge, Rahul Mane et al. (2017): Here the author has proposed that seed sowing machine is a device which helps in sowing of seeds in the desired position hence assisting the farmers in saving time.

Rahul maske and Omkar Mowade (2020): According to the author multifunctional agricultural vehicle mainly focuses on basic problems faced by our fellow farmers i.e., seed sowing, water spraying, cultivation and digging. Cultivation tool is removable. This operation is done by manual force. For spraying motor, battery and switch is given.

### WORKING PRINCIPLE



Above figure show the multipurpose agriculture machine and the machine mainly works on the man power. The multipurpose agriculture machine is



consisting of different components. They are frame, wheels, hopper with covering plate, two wheels for seeds, two wheels for grass cutting, diggers with adjusters, leveler with adjusting bolt ,hose pipe, chain transmission system with two sprockets, pesticide spraying , bevel gears . Wheels are connected to the chain transmission system. When the chain moves then seed wheel is rotated. Nozzles are attached to the seed storage tank as shown in above figure. A hose pipe is attached from the nozzle to the seed tank. The first operation is performs grass cutting . As the pushing force applied by a man on the machine. Then the wheels will be rotate. As the wheels rotate the bevel gear which is connected to the axle. As the bevel gear rotates then the small bevel gear which is mounted will rotate. As the rod is connected to the bearing which is fixed to the small bevel gear the rod will rotate. It mainly works on the principle of converting rotary motion to the sliding motion. The next step seed sowing operation. Whenever seed wheel rotates seeds are entered into the hose pipe. For the deep penetration into the soil. After seeds are penetrated into the soil then sand leveler helps the close of the channels which is digged. Digger has different positions as for our requirement for ploughing. We can adjust the digger up and down through bolt and nut and also sand leveler can be adjusted as for our requirement by adjusting with bolt and nut. The next step is spray the pesticides in the agriculture. In these using the pressure tank and it is connected the flywheel with the help of connecting rod. The flywheel is connected to the rear wheel axle by using chain and sprocket. The flow of fertilizer is maintained by using spring mechanism. It is a machine for spreading the fertilizer in continuous and controlled flow at uniform rate.

### COMPONENTS

#### 1. HOLLOW SQUARE PIPE



Hollow square pipe

Square hollow section comes in different sizes, specifications and wall thicknesses. It has a high weight.

#### 2. BEVEL GEAR



Bevel gears are gears where the axes of the two shafts intersect and the tooth bearing faces of the gears themselves are conically shaped.

#### 3. BEARING



A bearing is a machine element that constrains relative motion to only the desired motion and reduces friction between moving parts.

#### 4. BLADES



The blades are the most important component in the crop harvesting machine. The blade is made of iron component in which one is fixed to the frame and the other is movable.

#### 5. WHEEL



A wheel is a circular component that is intended to rotate on an axle bearing. The wheel is one of the key



components of the wheel and axle which is one of the six simple machines.

#### 6. CHAIN AND SPROCKET



A chain is used to connect two sprockets. One sprocket is the driver sprocket. The other sprocket is the driven sprocket. Chains that are used to transmit motion and force from one sprocket to another are called power transmission chains. A sprocket is a toothed wheel that fits onto a shaft. It is prevented from rotating on the shaft by a key that fits into keyways in the sprocket and shaft.

#### 7. SEED STORAGE TANK



Storage device is one of the important devices of the system. This component is stationary. To the bottom of this tank seed sowing disc is arranged. This disc serves the function of distribution of the seeds, as for each complete rotation of the rotating wheel.

#### 8. PRESSURE TANK



A sprayer is a device used to spray a liquid, where sprayers are commonly used for projection of water,

weed killers, crop performance materials, pest maintenance chemicals, as well as manufacturing and production line ingredients.

#### 9. TILLING



It is used to till the soil in the agriculture. The tilling operation is adjustable equipment.

#### 10. SURFACE LEVELING



The surface leveling equipment is as shown in figure. It is used to level the soil after seeding in agriculture. It is adjustable equipment.

#### ADVANTAGES

1. Simple operation.
2. Easy to control.
3. It doesn't require any battery and engine for operating.
4. It does not require any fuel.
5. It is low of cost.

#### DISADVANTAGES

1. It takes more time than fuel based machines.
2. It cannot be more helpful for the people having large farming lands that are more than 3acres.

#### APPLICATIONS



1. It is used to the grass cutting operation.
2. It is used to the tilling operation.
3. It is used to seed sowing operation.
4. It is used to surface leveling operation.
5. It is used to the spraying operation.

6. Pratikkumar V. Patel and Mukesh Ahuja ,“ Research and Design of Multipurpose Agriculture Equipment” International Research Journal of Modernization in Engineering Technology and Science, Vol-2,July-2020.

### CONCLUSION

Farmers use tractors for tasks such as plowing, sowing, tilling, grinding, and other agricultural tasks. In addition, the tractors cost is high. Small farmers unable to purchase the tractors and special equipments. So the multipurpose agriculture machine is help to small farmers. A multipurpose agriculture machine is designed to perform multiple agriculture tasks like a Grass cutting, Tilling, Seed sowing, pesticide spraying and surface leveling. which can help farmers save time , increase productivity and reduce labor costs.

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