

# Agricultural Seed Sewing Machine

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**Abstract:** Presently, small land holding farmers use work bulls mostly for land preparation. Generally, cultivation of any crop involves various steps like seed selection, field preparation, fertilizing, sowing, irrigation, germination, thinning and filling, weed removal, vegetative stage, flowering stage, pesticide spraying, fruit, or pod formation stage, harvesting and threshing. Farmer has to use various agricultural Equipment's and labours for caring out those steps, our purpose is to combine all the individual tools to provide farmers with mechanical seed sowing equipment which implements all the scientific farming techniques and specifications and suitable for all type of seed-to-seed cultivation with as minimum cost as possible. This project work is focused on the design and fabrication of mechanical seed sowing equipment which is used for land preparation, sowing, and levelling process. The mechanical seed sowing agricultural equipment is very simple to use, the various adjustments are made with ease, and it is maintenance free.

**Keywords:** Nut & Bolt Hoses and Shaft. IR Transmitter and IR Wheels, Ball Bearing.

## I. INTRODUCTION

Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. A man without food for three days will quarrel, for a week will fight and for a month or so will die || . Agriculture is a branch of applied science. Agriculture is the science and art of farming including cultivating the soil, producing crops and raising livestock. It is the most important enterprise in the world. Over the years, agricultural practices have been carried out by small- holders cultivating between 2 to 3 hectares, using human labor and traditional tools such as wooden plough, yoke, leveller, harrow, spade, bigsickle etc. These tools are used in land preparation, for sowing of seeds, weeding and harvesting. Modern agricultural techniques and equipment's are not used by small land holders because these equipment's are too expensive and difficult to acquire.

By adopting scientific farming methods, we can get maximum yield and good quality crops which can save a farmer from going bankrupt but majority of farmers still uses primitive method of farming techniques due to lack of knowledge or lack of investment for utilizing modern equipment. The use of hand tools for land cultivation is still predominant in India because tractors require resources that many Indian farmers do not have easy access to. The need for agricultural mechanization in India must therefore be assessed with a deeper understanding of the small holder farmer 's activities. There is huge gap in technology adoption and implement used with small and marginal farmers.

Sustainable improvement in the livelihoods of poor farmers in developing countries depends largely on the adoption of improved resource conserving cropping systems. While most of the necessary components already exist, information on the availability and performance of equipment is lacking and effective communication between farmers and agricultural research and development department is unsuccessful. Farming has undergone a great evolution in last 50 years. Though these devices were highly efficient, there is a need to have certain changes. [2] Agricultural machinery is machinery used in farming or other agriculture. Mechanized agriculture is a process of using agricultural machinery to mechanize the work of agriculture, greatly increasing farm worker productivity. In modern times, powered machinery has replaced many farms jobs formerly carried out by manual labour or by working animals such as oxen, horses, and mules. The entire history of agriculture contains many examples of the use of tools, such as the hoe and the plough. But the on-going integration of machines since the Industrial Revolution has allowed farming to become much less labour intensive. The biggest profit of mechanical machine is that it saves the labour.

However, it also saves energy and materials and to improve the quality, accuracy, and precision. The seed feeding is the important stages in the agriculture field. The design of mechanical seed sowing Agro equipment machine will help Indian farmers in rural side and small farm. It will reduce the cost of seed feeding,

## II. LITERATURE REVIEW

M.V. Achutha, Sharath Chandra. N, Nataraj. G.K, done the work on, Design and Analysis of Multipurpose Farm Equipment, according to his work, all trades of village artisanship in black-smith carpentry, stone etc. contributed to the design of development of farm tools through artisan's ingenuity. Carpentry made the counterpoise to lift the water from wells to irrigate crops. Big size of earthenware was made by potters to store grains for month to be safe from insects and pest's cobblers used whole skins of animals to carry water to irrigate horticultural crops besides entering dust roads. Farming is the backbone of Indian economy. In this agriculture sector there is a lot of field work, such as weeding, reaping, sowing etc. Apart from these operations, spraying is also an important operation to be performed by the farmer to protect the cultivated crops from insects, pests, fungi and diseases for which various insecticides, pesticides, fungicides and nutrients are sprayed on crops for protection

We have developed agriculture 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. The advent of new concept gives the opportunity to develop a completely new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right way.[1]

Nitin Kumar Mishra, Shashwat Khare, Sumit Singh, Mithun Dabur, done the work on, Multi-Purpose Agriculture Machine, according to his work, finding solutions, to meet the "Energy - demand" is the great challenge for Social Scientist, Engineers, Entrepreneurs and Industrialist of our Country. This multipurpose ago equipment is thus designed to reduce the cost of harvesting, spraying and seed feeding. In the development of multipurpose ago equipment we utilize the past data and techniques. In this way the design of multipurpose Agro equipment is safe. Such human powered machine systems will help to a great extent in improving the production per acre and increase profitability of small and middle-class farmers. A new type of multipurpose mechanism is fabricated which is different from other machines and will work on non-conventional energy source which is purely human operated. Such systems are of much importance in Asian countries, as almost all Asian countries are facing electricity and power scarcity which results in twelve to fourteen hours load shedding in rural areas especially in India. Therefore, there is the need to develop a locally, fabricated multiple multipurpose Agro equipment.[2]

Kyada, A. R, Patel, D. B., done the work on, Design and Development Of Manually Operated Seed Planter Machine, according to his work, The basic requirements for small scale cropping machines are, they should be suitable for small farms, simple in design and technology and versatile for use in different farm operations. A manually operated template row planter was designed and developed to improve planting efficiency and reduce drudgery involved in manual planting method. Seed planting is also possible for different size of seed at variable depth and space between two seed. Also, it increased seed planting, seed/fertilizer placement accuracies and it was made of durable and cheap material affordable for the small-scale peasant farmers.

The operating, adjusting and maintaining principles were made simple for effective handling by unskilled operators (farmers). This manual seed planter machine has considerable potential to greatly increase productivity. Other countries of the world where the two-wheel tractor is the main traction unit in farming. The main task now is to promote this technology and have available to farmers at an affordable price. The manual Seed Planter machine can be readily made from local components in workshops. The only specialized items required are the seed meters plunger which can be sourced at an inexpensive price from local promoter and plunger is easily manufactured. By using of this machine, achievement of flexibility of distance and depth variation for different seed plantation is possible. [3]

### III. PROBLEM STATEMENT

There are some limitations of Tractor use on small agricultural land that are, High initial cost (6 to 8 lakh), high maintenance cost (diesel cost) and service cost for replacing and repairs of the parts. Tractor wheels will destroy furrows. An average weight of tractor is around 2 tons, when its weight acts on soil it tends to form a clods, these clods prevents the root growth. Tractors are not enough flexible for variations like edge tilling and corner furrowing. Requires skilled person. The handling of tractor in an agricultural field is comparatively difficult than conventional technique. Once the crop is germinated tractor has no further use in cultivation & seed sowing process. To overcome this problem here we can use mechanical seed sowing agricultural machine which will use for tiller, seed sower & levelling operations.

### IV. AIM & OBJECTIVES

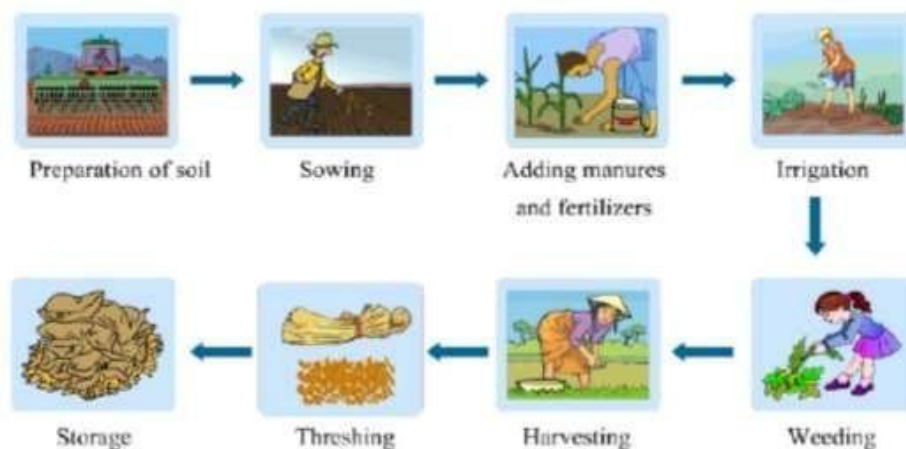
The following are the objectives of this project work:

1. It is the best and economic to farmers in today's world without any huge investments and it can be worked without any external source like (electrical energy) and we can contribute today's world without air pollution and water pollution.
2. To make a machine that can access by any kind of farmer at low cost. The recommended down to row spacing seeds rate, seed to seeds spacing and depth of seed placement vary from crop to crop and for different Agro-climatic conditions to achieve optimum yields.
3. To make mechanical seed sowing agricultural machine which will use for tiller, seed sower & levelling.
4. To design & develop mechanical seed sowing agricultural machine which will be reduce time, cost & effort of farmer.

### V. PROPOSED SYSTEM

Processes involves in agriculture:

India is known for its agricultural economy. According to 2011 census, 61.5% of Indian population is rural and dependent on agriculture. But still this major population lacks in mechanised agriculture. Since independence efforts are being made to modernise our economy by introducing newer kinds of technology. This modernisation has been applied to our agriculture too, but due to prevailing socio- economic situation the three A's (accessibility, availability, affordability) are still missing or in layman words our poor farmers hasn't been able to access the new technology. Agriculture involves many processes. This includes preparation of soil, sowing adding, adding manures and fertilizers, irrigation, weeding, harvesting, threshing, and the last one is storage. The above figure clearly explains different processes involves in farming.[7] The processes involve in farming are: -



**Figure:** Processes involves in agriculture.

**Preparation of Soil:**

This is basic and important step in agriculture before cultivation of crops. It includes loosening of soil, removing weeds from the soil before sowing of seeds. Loosening of soil improves the air circulation in soil and enhances the water retaining capacity of the soil.

**Sowing:**

This is the process of planting seeds in ground. An area or object that has had seeds planted in it will be described as being sowed.

**Adding Manures and Fertilize:**

Manures and fertilizers are substances that are added in the form of nutrients for healthy growth of plants.

**Irrigation:**

It is the application in which controlled amounts of water is provided to the plants at needed intervals.

**Weeding:**

This is a process to remove weeds from a piece of ground.

**Harvesting:**

Harvest is the process of gathering mature crops from the fields. Reaping is the cutting of grain or pulse for harvest.

**Threshing:**

Threshing is the process of loosening the edible parts of grain (or other crop) from the husks and straw to which it is attached. It is the step-in grain preparation after reaping and before winnowing, which separates the grain from the chaff.

**Storage:**

It is the final step where the crops are stored. There are many mechanical tools that are employed to carry out these processes. Mechanical tools that employ at different processes of agriculture can be divided into two parts.

**VI. WORKING**

**Working of Mechanical Seed Sowing Machine:**

Mechanical seed sowing machine consists of soil digger blades at front end & leveller tool at rear end. Seed metering devices are those devices that meter the seed from the seed box and deposit it into the delivery system (plunger) that conveys the seed for placement. Seed to seed spacing and depth of seed placement vary from crop to crop for different Agro-climate conditions. As machine will push or power to wheel is rotating which transmit power to Nylon disc through chain mechanism. Now Nylon disc is mounted on shaft which rotates the disc to seeding in soil. Construction of mechanical seed sowing machine is consisting of mechanical power transmitting type using chain. When we give the power for propel the machine & seed sowing mechanism will work. We can use this mechanical seed sowing machine will work as per requirement in the farm field.

**VII. ADVANTAGES & APPLICATIONS**

**Advantages:**

1. Machine is easy to fabrication & assembles.
2. Machine is profitable & easy to operate.
3. Maintenances cost of machine is low.
4. Multiple operations can be performed at a time.
5. No need of skilled operator &controlling of operation easy with Smooth working.
6. It minimizes time & cost of man power.

**Applications:**

1. Includes scientific forming techniques. Sequence spacing seed sowing machine has more advantages than regular seed sowing machine. Involves precision forming and fool proofing technology.
2. By using this machine, a single seed can be placed in the desired spacing, so that the wastage of the seeds will be reduced. This will reduce the thinning operation during the germination time.
3. Suitable for all types of seed sowing application. Low cost, it's the lowest priced agricultural equipment ever built. Multitasking seed sowing done simultaneously.

**VIII. CONCLUSION**

While concluding this report, we feel quite fulfilled in having completed the project assignment well on time, we had enormous practical experience on fulfilment of the manufacturing schedules of the working project model. We are therefore, happy to state that the in calculation of mechanical aptitude proved to be a very useful purpose. Although the design criterions imposed challenging problems which, however were overcome by us due to availability of good reference books. The selection of choice raw materials helped us in machining of the various components to very close tolerance and thereby minimizing the level of balancing problem. Needless to emphasize here that we had lift no stone unturned in our potential efforts during machining, fabrication and assembly work of the project model to our entire satisfaction to solve the problem in agricultural field for social welfare. This manual machine has considerable potential to greatly increase productivity. The main task now is to promote this technology and have available to farmers at an affordable price.

The manual machine can be readily made from local components in workshops. The only specialized items required which can be sourced at an inexpensive price from local promoter can easily manufactured. By using of this machine, achievement of flexibility of distance and depth variation for different machine in farming is possible. In this way we conclude that, the different operation can be performed at a time without polluting the environment. Hence, we selected the topic "MANUAL SEED SOWING AGRICULTURAL MACHINE" to contribute for sustainable agricultural machine.

The various components required for building the agricultural equipment has been designed as planned. The single system which can perform multi operations like Sowing and inter cultivation. It will reduce external charges like fuels; electricity etc. And this will be helpful for poor farmers. It will be single system which contains multi attachments and can be easily assembled and dismantled comfortably. All the fasteners used in the equipment are of the same size. The equipment weight is around 10 to 12kg (Excluding attachment) thus it can be carried easily in farmland. The equipment can do the work of most of labor a day which reduces the labor cost of the farmer.

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