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## FABRICATION OF MULTIPURPOSE FARMING MACHINE

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**Abstract-** Agriculture is the major sector in the world that plays a vital role in developing the economy of a nation. The success of crop production depends on timely seeding of These crops with reduced dull work of farm labor. Nowadays, the agricultural activities are performed by using tractors, Harmful gases are released throughout the process, which cause a lot of damage to the environment. The basic objective of sowing operation is to put the seed in rows at desired depth and seed to seed Spacing, cover the seeds with soil and provide proper compaction over the seed. The recommended row to row spacing, seed Rate, seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climatic conditions to Achieve optimum yields. This machine reduces the efforts and total cost of sowing the seed placements.

**Keywords:** : seed, sowing, planting, plunging, sliding plate, agriculture.

### INTRODUCTION

The Indian economy is based on agriculture. Development in agriculture leads to raise in economic status of country. In India, farmers are facing problems due to unavailability of labours, traditional way of farming using non efficient farming equipment which takes lot of time and also increases labour cost. This project is all about enhancement in seed sowing and farming operations by using multifunctional seed sowing machine. The main objective of sowing operation is to place seed at proper position respective of other placed seeds in every row at particular depth and provide a cover of soil on it. As per change in shape and size of different seeds the parameters like distance between two seeds, depth of seed, planting rate chances. This project is an attempt to produce multifunctional and highly efficient seed sowing machine which will reduce time of plantation, cost of labour, and enhances production. Traditional method of seed sowing is based on assumptions of seed to seed spacing and depth of placement which is not at all efficient and besides this ,it requires lot of time and efforts too. The agriculture has always been the backbone of India's sustained growth. As the population of India continues to grow, the demand for producing grows as well. Hence, there is a greater need for multiple cropping in the farms and this in turn requires efficient and time saving machines. The paper discusses different types of seed sowing machine which will be helpful for the agriculture industry to move towards mechanization . Primarily this system works manually, but with lesser input energy requirement.

### SOWING METHODS

- Broadcasting
- Dibbling
- Sowing behind the country plough (manual and mechanical drilling)
- Seed drilling

**Broadcasting:-** Broadcasting is otherwise called as random sowing. Literally means 'scattering the seeds'. Broadcasting is done for many crops. Broadcasting is mostly followed for small sized to medium sized crops. This is the largest method of sowing followed in India, since; it is the easiest and cheapest and requires minimum labours. To have optimum plant population in unit area certain rules should be followed.

- Only a skilled person should broadcast the seeds for uniform scattering.
- The ploughed field should be in a perfect condition to trigger germination. The seeds are broadcasted in a narrow strip and the sowing is completed strip by strip. To ensure a good and uniform population, it is better to broadcast on either direction. This is called criss-cross sowing. If the seed is too small, it is mixed with sand to make a bulky one and for easy handling. Ex. Sesame seeds are mixed with sand at 1:15 or 1:10 ratio and sown. In certain cases the person sowing will be beating the seeds against the basket for uniform scattering. Ex. Sorghum, pearl millet. After broadcasting, the seeds are covered gently either using a country plough with a very shallow ploughing or some wooden planks (boards / levelers) are used to cover the surface. In some cases, tree twigs or shrub branches are used in fig .



BROADCASTING METHOD OF SOWING

### Broad casting

#### Disadvantages

- All the seeds broadcasted do not have contact with the soil. 100% germination is not possible.
- Enhanced seed rate is required.
- Seeds cannot be placed in desired depth. Desired depth ensures perfect anchorage. Lodging (falling down) is common in broadcasting.

**Dibbling** This is actually line sowing. Inserting a seed through a hole at a desired depth and covering the hole. Dibbling is practiced on plain surface and ridges and furrows or beds and channels. This type of sowing is practiced only under suitable soil condition. Rice fallow cotton is dibbled on a 2 plain surface. The seeds are dibbled at 2/3rd from top or 1/3rd at bottom of the ridge. Before sowing, furrows are opened and fertilizers are applied above which seeds are sown. The seeds do not have contact with the fertilizers. This is done for wider spaced crops and medium to large sized seeds. Ex. Sorghum, maize, sunflower, cotton are dibbled on ridges and furrows. Both beds and channels; and ridges and furrows come under line sowing. While earthing up, the plant occupies middle of the ridge. Earthing up is essential for proper anchorage of the root system. Advantages of line sowing as shown in fig.



### Dibbling

**Sowing behind the plough** :-Sowing behind the plough is done by manual or mechanical means. Seeds are dropped in the furrows opened by the plough and the same is closed or covered when the next furrow is opened. The seeds are sown at uniform distance. Manual method is a laborious and time consuming process. Seeds like redgram, cowpea and groundnut are sown behind the country plough. Major sown crop is ground nut. Seeds are sown by mechanical means by Gorus – seed drill. A seed drill has a plough share and hopper. Seeds are placed on hopper. Different types of seed drill are available, e.g., simple Goru – Guntakas. As shown in fig.



Seeding behind the plough

#### Advantages:

- The seeds are placed at desired depth covered by iron planks,
- except very small, very large seeds most of the seeds can be sown, e.g. maize, sorghum, millets, sunflower, etc.

#### Drill sowing (or) Drilling

Drilling is the practice of dropping seeds in a definite depth covered with soil and compacted. In this method, sowing implements are used for placing the seeds into the soil. Both animal drawn Gorus and power operated (seed drills) implements are available. Seeds are drilled continuously or at regular intervals in rows. In this method, depth of sowing can be maintained and fertilizer can also be applied simultaneously. It is possible to take up sowing of inter crops also. It requires more time, energy and cost, but maintains uniform population per unit area. Seeds are placed at uniform depth, covered and compacted as shown in fig.



Seeding and drilling

## LITERATURE REVIEW

**Adalinge Nagesh .B et, al [1]:** say's the recommended row to row spacing, seed rate, seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climatic conditions to achieve optimum yields. The comparison between the traditional sowing method and the new proposed machine which can perform a number of simultaneous operations and has a number of advantages .The basic objective of showing operation is to put the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil and provide proper compaction over the seed.

**s Kalash Singhal et, al [2]:** proposed this machine maintains seed to seed spacing and row to row spacing. To negate these problems, this machine uses Solar Energy as an eco-friendly energy resource. Seed Hopper and Water Tank are used for seed sowing and irrigation operations respectively. Solar Panel is used to convert solar energy into electrical energy and a DC Motor converts this electrical energy into mechanical energy to rotate a cutter for digging operation. Air and Noise Pollution are caused by the combustion of fossil fuels in IC Engines and External Combustion Engines. There is a need for improvement in agriculture sector, which can be achieved by using advanced technological methods for farming processes like digging, sowing and irrigation etc. Mechanization reduces labour cost and improves the overall productivity without affecting the quality of soil. It also decreases the cost of sowing the seeds and requirement of labour. This paper represents a machine which can carry out various farming activities simultaneously. Agriculture Agriculture Sector is the backbone of Indian Economy.

**S. Sudhakar et, al [3]:** discussed this project is about a seed sowing system with a fitted plough that can be conveniently adjusted with the aid of a bolt and nut. The time it takes to sow seeds has been found to be greatly reduced using this process, saving labour costs and manpower. The seed sower that has been attached sow's seeds using a sowing disc that is installed in the seed chamber and rotated by a spinning wheel. A sand leveler has been installed in the system to cover the sowed area after each sow. The plough can reach a depth of around 5- 8 cm with the attachment. When the plough becomes corroded, it can be quickly replaced.

**Dr. K. Senthilkumar et, al [4]:** say's It also enables grass cutting in a uniform ratio and ,it can also tillage the land for sowing seeds. This also increases the planting efficiency and accuracy. Sowing machine should be suitable to all farms, all types of crops, robust construction, also is should be reliable, this is basic requirement of sowing machine. Thus we are designing sowing machine which is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. We are designing it with easily available materials thus it will be cheap and very usable for small scale farmers. For this machine we can plant different types of seeds also . For effective handling of the machine by any farmer or by any untrained worker we simplified its design. Also its adjusting and maintenance method also simplified .

**Thorat Swapnil V et, al [5]:** proposed this also increased the planting efficiency and accuracy. Sowing machine should be suitable to all farms, all types of corps, robust construction, also is should be reliable, this is basic requirement of sowing machine. For this machine we can plant different types and different sizes of seeds also we can vary the space between two seeds while planting. Thus we made sowing machine which is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. For effective handling of the machine by any farmer or by any untrained worker we simplified its design. We made it from raw materials thus it was so cheap and very usable for small scale farmers. Also its adjusting and maintenance method also simplified.

**Abhijeet V et, al [6]:** discussed it increases the labor cost. So, introducing the design of seed sowing machine with cheaper cost, so that it can be easily affordable to small budgetary farmers. In the farming process, seed sowing operation takes more time and more labor power. Agriculture is vital source of income in India, the Indian economy is based on the agriculture field. The fabrication of Roller type seed sowing machine is to improve productivity of seed sowing operation and saving process time, labor cost and Energy. The conventional seeding operation, the seed feed rate is more but the time required is also more. The basic objective of seed sowing machine operation is to put the seed in the proper row wise manner into the soil at desirable depth, spacing and cover the seed by soil. For fulfilling the future demands there is a need of advancement in techniques and equipment of agriculture farming.

**P. R. Gajbhiye et, al [7]:** say's the row spacing, seed rate, seed spacing and depth of seed placement differ according to crops and for different agro-climatic conditions to achieve optimum yields. The comparison between the normal sowing method and the new proposed machine can perform a variety of simultaneous operations and has several benefits. As day by day the labour availability becomes a great concern for the farmers and labour cost is more, this machine minimizes the efforts and total cost of sowing the seeds and fertilizer placement. The essential objective of sowing operation is to place the seed and fertilizer in rows at desired depth and seed to seed spacing, cover the seeds with soil & provide proper compaction over the seed.

**Waikar et, al [8]:** discussed the fabricated device called "Design and Fabrication of Multipurpose Farming Equipment (Sowing, Ploughing, Sprayer With Solar). The main objective of this project is to improve the current way of farming by introducing multipurpose equipment. As there is tremendous development in the field of engineering the current scenario makes us to find solution for major problems faced by the agricultural field. To sow the seeds first land should be cleaned and after sprayed the seeds the land should be filled. The Multipurpose machine is used to sowing the seeds and fertilizer spray into land and grass cutting for making lots of plant production in agricultural field. It helps farmers by grass cutting and sowing the seeds and fertilizers. It will be very useful for agricultural purpose and very simple in construction and economical. It is a mechanical device here no electrical or other power source is not required. The cost of this machine is very low and easy to operate simple in construction. Lot of equipment was inverted to sophisticate the work of labor in the farms.

**Mr. Akshay V et, al [9]:** say's In this project we tried to design and fabricate machine to reduce target energy input in more efficient way than in the past. The main specialty of this projects that it can also sow cotton seed with ease .The agriculture field needs to find solutions on old agricultural technique and replace them with more efficient technique. Small scale farming has huge benefits



of this approach. The advent of autonomous system architecture gives us opportunity to develop a new range of agricultural equipment based on small smart machine that can do the right thing in the right place at the right time in the right way. We can now move towards a new generation of equipments. Hence in this work of project we decided to design and build a machine which will be available for farmer of small scale production at cheaper rate also which can reduce their expenditure and the profit of farmer at the same time.

**Dr. Mangesh Shende et, al [10]:** discussed the basic function of a sowing machine is to sow the seed in a row at the desired depth and keep it in place. We made sowing machine which is operated manually but reduces the efforts of farmers thus increasing the efficiency of planting also reduces the problem encountered in manual planting. Most countries in the current generation lack sufficient skilled manpower in the agriculture sector, which has a negative impact on developing countries' growth. The separation between two seeds we use a keypad to enter the distance between two seeds. As a result, it is the time to automate the agriculture industry in order to solve this problem by utilizing advanced technology in the growing process.

**Sai Prasanth et, al [11]:** say's the aim of this project is to design and develop a solar operated seed sowing machine. So it's a time to automate the agricultural sector to overcome this problem by using upgraded technology for cultivation activity. In the current scenario, most of the countries do not have sufficient skilled man power in the agriculture sector and it affects the growth of developing countries. To meet the future food demands, the farmers have to implement the new techniques which will not affect the soil texture but will increase the overall crop production.

**Thenmozhi Devaraj et, al [12]:** say's this reduces skilled labours in agriculture field. In this Seed sowing machine, based on the instruction given the machine will operate in three modes like slow, medium and speed. Radio Frequency based solar controller is designed for seed sowing machine. This type of machine will be more useful in agriculture field. But agriculture is the back bone of our country, so we need to introduce some efficient methods to improve farming. Sowing, Spreading and Ploughing mechanisms can be done by using this machine. The distance between the two seeds will be adjusted using the motor in the machine. The controller is designed to make the machine to drive in slant surface of 45 degree and also sense obstacles situated front and back of the machine. Recently, farmers facing many economical issues, so they move in search of some other jobs. Using solar panels can improve the efficiency. Arduino is used to control the machine.

**Ms. Trupti A et, al [13]:** proposed It is the backbone of our economy system. In seed sowing machine system they are used battery powered wheels and dc motor inbuilt in these wheels. In this project work focused on seed sowing processes and tried to solve the problem. The end of system machine reached and it create alarm. This system provides all the facility which can work efficiently. When any obstacle comes in the in-front of machine or divert path the seed sowing machine can detect this obstacle very easily. When the seeds are empty it detects the level of storage seed and indicates the alarm. Agriculture plays an important role in the life of economy. In each complete rotation of rotating wheel there is seeds falls from this seed drum and the seed plantation process can take place smoothly as well as without wastage of seeds.

**Byre Gowda et, al [14]:** say's the important of this project is to solve the farmer's problems and to develop an agriculture using solar seed sowing machine. To give good food demand, the farmers must improve their techniques that techniques will not affect the soil but it will increase the crop. In today's life moving towards the fast growth of all division including agriculture also.

**Roshan V et, al [15]:** proposed the conventional seed sowing machine is less efficient, time consuming. This paper deals with the various sowing methods used in India for seed sowing and fertilizer placement. The seed feed rate is more but the time required for the total operation is more and the total cost is increased due to labor, hiring of equipment. The comparison between the traditional sowing method and the new proposed machine which can perform a number of simultaneous operations and has number of advantages. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. In the farming process, often used conventional seeding operation takes more time and more labor. Today's era is marching towards the rapid growth of all sectors including the agricultural sector.

**A.O.Hannure et, al [16]:** proposed plant nursery is important part of agriculture field and facing many problems. In plant nursery more time is required for plantation which is due to seed feeding process. The customised belt contains conical shaped holes on sheet metal which mounted on cloth material. For reducing these problems of plant nursery research of automatic seed feeder mechanism is used. This customised belt transfer seeds from one end to other end. Those seeds are passed through stripper plat and present in holes are fall down in the tray. While movement of belt excess amount of seeds are minimised by stripper plate. The problems are availability of labours, low productivity rate and more manual efforts required for seed feeding. Hopper consists of seeds (brown mustered seed) are fall down on belt.

**K.Saravanan et, al [17]:** proposed the Chickpeas Seed sowing machine is a key component of agricultural field. The aim of this project is to design and develop an Automatic seed sowing robot for Chickpeas Seed. Seed sowing and digging robot will move on different ground contours and performs digging and sowing the seed. The various technique used in India for seed sowing and fertilizer placement are manual, ox and tractor operator .In In Today era is marching towards the rapid growth of all sectors including the agricultural sector. And to further reduction of labor dependency, IR sensors are used to maneuver rerobot in the field. To meet the future food demands, the farmers have to implement the new techniques which will not affect the soil texture but will increase the overall crop production. Tractor is running on fossil fuel which emits carbon dioxide and other pollution every second.

**B S Kanthraju et, al [18]:** say's the intention of this work is to fabricate and design a solar powered multi operated machine .The seed sowing machine is a key element of the rural field. The numerous technology utilized in India for seed sowing and fertilizer placement are guide, ox, and tractor operators. The guide and ox operator strategies are time-ingesting and productiveness is low. Today's technology is marching closer to the speedy boom of all sectors such as the rural sector. The tractor is strolling on fossil gasoline which emits carbon dioxide and different pollutants each second. To meet the future food demands, the farmers should put into effect the brand new strategies so as to now no longer have an effect on the soil texture however will growth the general crop production.

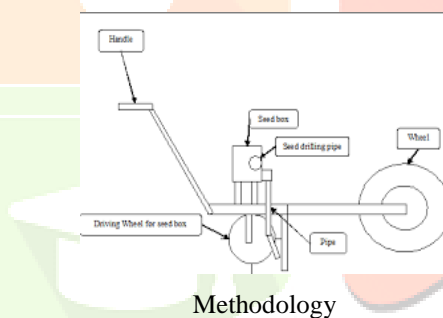
**B. B. Uzoejinwa et, al [19]:** proposed Metering Metering mechanism is a key component of planters that directly affect crop development and yield based on the performance of the particular design. A vertical plate maize seed planter which is adapted for gardens and small holder farmers cultivating less than two hectares has been designed, constructed and tested. Vertical plate metering device is intended to minimize seed damage during planting while improving metering efficiency and field capacity. The major components of the planter are hopper, seed metering mechanism, seed chute, furrow opener, furrow closer and wheels. Field test was carried out to determine the field efficiency, effective field capacity, metering efficiency and time required to plant one hectare of farmland. The average number of seeds planted per stand was determined as two and percentage seed damage was determined as 1.71%. Results showed that the planter has a metering efficiency of 88.94%, effective field capacity of 0.27ha/hr and field efficiency of 71.86%.The time required to plant one hectare of farmland was determined as 3.7 hours.

**Sambasivam R et, al [20]:** say's we can plant seeds using this machine of different shapes, sizes, and spacings between two seeds.All sowing machines should be suitable for all kinds of farms, all types of crops, and should be constructed robustly, as well as be reliable, this is a basic requirement for a sowing machine. The adjusting and maintaining of the machine have been simplified as well. In order for any farmer or untrained worker to handle the machine effectively, its design has been simplified. Using raw materials, we made it inexpensive and easily usable by small farmers. In this way, we made a sowing machine that is operated manually while reducing the amount of work farmers have to do, thereby increasing the efficiency of planting and reducing problems associated with manual planting.

This literature review give the more information about the seed sowing machine . it has some complication is there to use the seed sowing materials in the different application in the society.

## METHODOLOGY

The seed dispensing wheel is fitted inside the hopper using bearings this dispensing wheel is engaged with the axel. The number of seed dispensing wheels can also be increased to cover multiple rows . It has provisions for installation of wheels and seed dispensing mechanism. The seed dispensing wheel can be changed according to the seed used and seed spacing required. To guide the machine a handle is used. The number of grooves provided on the wheel determines the number of seed to be dispensed and seed spacing. In order to do it, a metallic bar is attached behind the machine and it is simply dragged over the small trench. A hopper is used to store the seeds. A plough used in the front to make a small trench in the ground to sow the seeds as shown in fig.



## WORKING PRINCIPLE

It has a frame constructed from 20\*20mm square pipe and 20\*40 mm rectangular stainless steel pipe. It has provisions for installation of wheels and seed dispensing mechanism. To guide the machine a handle made up of 20\*20 mm and 20 mm diameter stainless steel pipe is used. A plough made up of 2 inch flat bar is used in the front to make a small trench in the ground to sow the seeds. A hopper made up of 14 gauge sheet metal is used to store the seeds. The seed dispensing wheel is fitted inside the hopper using bearings this dispensing wheel is engaged with the axel. When the machine is given a push, the wheels starts to rotate hence the seed dispensing wheel also rotates .This makes the seed to come out one by one through the groove provided in the dispensing wheel. The number of groves provided on the wheel determines the number of seed to be dispensed and seed spacing. The seed dispensing wheel can be changed according to the seed used and seed spacing required. The number of seed dispensing wheels can also be increased to cover multiple rows. Now once the sowing is done the seeds should be covered with soil. In order to do it, a metallic bar is attached behind the machine and it is simply dragged over the small trench. This covers the trench with soil and finishes the process.

## FABRICATION:

### COMPONENTS USED:

20 \*20 MM STAINLESS STEEL SQUARE PIPE  
 2 MM STAINLESS STEEL SHEET METAL  
 FLAT BAR  
 STAINLESS STEEL PIPE  
 8 INCH WHEEL  
 (UC205) BEARINGS  
 INCH STAFT  
 STAINLESS STEEL SHAFT

**STAINLESS STEEL PIPE:-****Specifications:-**

Dimension:- 40 mm \* 20 mm and 20\*20mm

The stainless steel rectangular pipe and square pipe is used to construct the chassis of the machine as shown in fig.



Stainless steel pipe

**STAINLESS STEEL SHEET METAL:-****Specifications:-**

Thickness:-2 mm

The 2mm stainless steel sheet metal is used to construct the hopper of the machine as shown in fig.



Stainless steel sheet metal

**FLAT BAR:-****Specifications:**

Dimensions:- 5mm thickness and 2 ½ inch width.

The flat bar is used in the construction of plough and wheel frame of the machine as shown in fig.



Flat bar

**STAINLESS STEEL PIPE:****Specifications:**

Diameter:-20mm

The circular pipe is used to construct the handle of the machine as shown in fig.



Stainless steel pipe

**8 INCH WHEEL:****Specifications:**

Wheel diameter :- 8 inch

Wheel thickness:- 1inch

The wheel is used for smooth movement of the machine as shown in fig .



Inch wheel

**BEARINGS(UC 205):-****Specifications:**

**inner bore diameter = 1 inch**

Ball bearings are used to provide smooth, low friction motion in rotary applications. Ball bearings are able to provide high performance and long lifetime in order to transfer the load from the balls to the inner races. The balls have minimal contact with the inner and outer races due to their spherical shape and this allows them to spin smoothly. Bearing is selected on standard size of the shaft diameter.

The bearings are used to hold the dispensing wheel in place and provide smooth movement for the shaft on which it is mounted as shown in fig.



Uc(205) bearing block

**1 INCH STAINLESS STEEL SHAFT:**

The shaft acts as an axel for the wheels and helps to couple the wheels to main frame through the bearing blocks as shown in fig.



Inch stainless steel shaft

**MAIN FRAME:-**

The main frame is like the chassis for the planter, it forms the platform on which other components are fixed. And for the handle 20 mm diameter pipe is used . The main frame has all provisions to install wheels , plough and seed dispenser. A frame to install the seed dispenser is also provided . To install the wheels , holes are drilled on the main frame to hold the bearing block and for guiding the machine handle is welded. First the steel pipes are cut and a basic frame is welded. The material of the main frame was selected based on achieving a reasonable weight and required strength and reliability and readily available material. It is constructed using 20\*20 mm square pipe and 20\*40 mm mild steel rectangular pipe as shown in fig.



Main frame

#### SEEDER MECHANISM:-

The seeder mechanism has a plough made from 2 inch mild steel flat bar. The depth of the plough can be adjusted according to the need. The seed dispensing mechanism has three dispensing wheels that can be engaged with the axel . The hopper sits on top of the seed dispensing wheel and the seeds shall be filled in it. The hopper is constructed from 2mm mild steel sheet metal. The soil covering bar is attached to the main frame through steel chains for soil covering. The manufacturing methods involved are cutting, sanding drilling and arc welding process. Functional requirements of seed metering devices. Cover plate is used to cover remaining hole on seed metering plate because at a time for one revolution of shaft only one seed is required to deposit. 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. Meter the seed at a predetermined rate/output (e.g. Meter the seed with the required accuracy (spacing) to meet the planting Pattern requirements. Cause minimal damage to the seed during the metering process. All function can be fulfill by using one plate as shown in fig.



Seeder mechanism

#### 4.10 FABRICATED MACHINE :

By using all the above components, we fabricated the seed sowing machine as shown in fig.



Fabricated machine



**RESULT AND DISCUSSIONS****CALCULATIONS**

calculation of Seed Sowing machine

The dispensing wheel is directly mounted to the axle hence, when the wheel completes one rotation, the dispensing wheel also completes 1 rotation.

For demonstration purpose, we are using dispensing wheel of groundnut, Lady's finger and Green peas.

Formulas :

circumference of the wheel  $=2\pi r$

circumference of the wheel  $=2 \times 3.14 \times 102 \text{ cm}$

$=64 \text{ cms}$

When the wheel completes 1 rotation on ground.

**Number of Grooves on the dispensing wheel :****GROUND NUTS :**

Seed spacing for ground Nut is 25cm.

Number of grooves on the wheel (Dispensing)

$= \text{Circumference}/\text{seed spacing} = 64/25 = 2.5 \sim 2$

2 Grooves are required for ground nuts as shown in fig.



Ground nut seeds

**LADYS FINGER :**

The Seed spacing for Lady finger is 30cm Number of grooves on the dispensing wheel

$= \text{Circumference}/\text{Seed spacing}$

$= 64/30$

$= 2.1 \sim 2$

2 grooves are required for Lady finger as shown in fig.



Ladys finger seeds

**GREEN PEAS :**

The seed spacing for Green peas is 14cm.

$= \text{Number of grooves on the dispensing wheel}$

$= \text{Circumference}/\text{seed space}$

$= 64/14$

$= 4.5 \sim 4$

4 grooves are required for green peas as shown in fig.



Green peas

**HOPPER:**

They enable you to cultivate soil, at deep or shallow levels, together with fertilizer application into the soil profile, all in one pass. However, they can also be used in the case of sowing as a seed hopper in aggregation with seed drills or a seed bar.

**Advantages of hopper:**

An important advantage of the hopper and storage tanks is that they are pressurized. This technical design increases the accuracy of batching, mainly in seed with more demanding distribution as shown in fig.

Volume of the hopper:-

Length, breadth & height of hopper

Volume =  $L * B * H = 10\text{cm} = 1000\text{cm}^3$



Hopper

Hopper capacity for different Seeds: -

A 166cm<sup>3</sup> Volume of hopper was taken & the amount of seeds that can be accommodated was measured in gms. Seed that the Hopper can amount hold is calculation.

**RESULT:**

We fabricated the components of the seed sowing machine, which is used for plunging, dispensing seeds, and covering the soil. All components are connected in such a way that they are used for farming purposes. The plunger is welded to the front of the frame. The main frame is welded with rectangular pipe and square pipe. The circular pipe is welded to the rectangular pipe for handle. And the plunger is adjustable, and it is cut off by a cutter machine. The dispensing wheel grooves are formed by the electronic angle grinder. The hopper's rectangular hole is made by a cutting machine. Some of the parts are assembled. Assembled parts are: shaft, (UCP205) bearing, wheels, hopper, plunger, and dispensing wheel. In this fabrication, welding, cutting, and grinding operations are involved. We concluded that our machine was effective and easy to operate in agricultural work.

**CONCLUSION**

This seed plantation machine has a lot of potential to boost planting output. Tractors have traditionally served as the primary source of traction in agriculture. This seed-planting machine's function will be served via adaptation. The metering equipment and sensors are the only expenses. Therefore, we may obtain flexibility of distance and control depth modification for various seeds by utilizing this machine. therefore suitable for all seedlings. We therefore made an effort to solve these issues and created machinery that will be useful to farmers for spraying and weeding activities in order to overcome the two concerns mentioned above. the above project outcomes guarantee a much more effective, less time intensive, and worker friendly machine. This seed planting machine's function has been fulfilled by its adaptation. As a result, there is a need to adopt this technology to make it accessible to small-scale farmers.

**Future scope of the work:**

The machine can be attached with multiple plough and seed dispensing wheel to cover multiple lanes. The same design can be used to convert the machine as a multipurpose agriculture vehicle. The machine can be made to be powered by an electric motor to reduce the manual effort. The research work helps to properly understand different seed sowing methods. The research work helps in better understanding of different operations involved in seed sowing process. The research work concentrates on design based on low budget which shall help small farmers mechanize their farm.

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