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Literature Review on Solar Powered Seed Sowing Machine by Using Remote Control

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Abstract-- The present review provides brief information about various types of innovations done in seed sowing equipments. The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and cover the seeds with soil and provide proper compaction over the seed. The recommended row to row spacing, seed rate and depth of seed placement vary from crop to crop and for different agro-climatic conditions to derive optimum yields. Seed sowing devices plays a narrow role in agriculture field.

Keywords- Seed sowing equipments, seed metering device, Row spacing.

1. INTRODUCTION

The agricultural has always been the backbone of India's temporary growth. As the population of India continues to increase , the demand for produce grows as well. Hence, there is a greater need for varies cropping in the farms and this in turn need efficient and time saving machines. The paper discusses different types of seed sowing machine which will be useful for the agriculture industry to move towards mechanization.

2. TYPES OF SEED SOWING

Seeds may be sown directly transplanted for transplanting, the seeds are sown in nursery and the nursery is later transplanted to field. The methods of sowing are enlisted and detailed as under.

2.1 Broadcasting

Broadcasting is one of the oldest and most common methods of seed sowing, where the seeds are just spread on the soil; the seeds may or may not be covered with soil. Broadcasting may be done manually, or through mechanical spreader or aeroplane.

Figure 2.1.1:-Broadcasting

2.2 Dibbling

Dibbling is the placing of seeds in holes or pits at equal predetermined distances and depths. This is done by dibble, planter or manually.

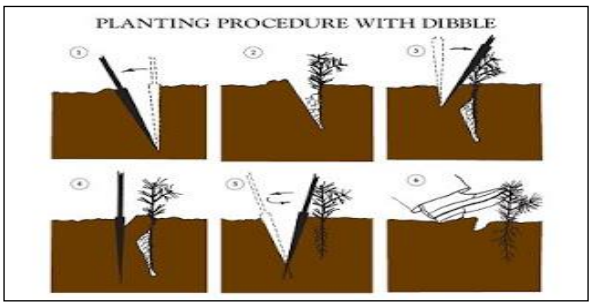

Figure 2.2.1:-Dibbling

2.3 Drilling

It is the practice of dropping of seeds in holes, the seeds are then covered and compacted. Drilling is the done with seed drill or seed-cum-fertilizer drill. Seeds can be drilled continuously in a row or drilling can be done at set distances. Rows can be set according to requirements.

Figure 2.3.1:-Drilling

2.4.Sowing Behind the Country Plough

In this method, the seeds are placed into the furrows ploughed in the field either continuously or at specific distance manually by a man working behind plough. The depth of sowing seeds depends on the depth of plough.

Figure 2.4.1:- Sowing Behind the Country Plough

2.5.Planting

Planting is the placement of seeds or propagules firmly in the soil for germinating and growth.

Figure 2.5.1:-Planting

2.6. Animal Drawn Seed Cum Fertilizer Drill

It is a low cost line-sowing device in which the seed and fertilizer -are metered by the operator. The rate of metering depends upon the skill of the operator. Tiphan refers to three row sowing device. The drill consists of a frame made of mild steel box iron part. The furrow openers, funnels for feeding seed and fertilizer, hoses for connecting funnels with pipes mounted on furrow openers, hitch assembly and handle are mounted on this frame. The distance between the rows can be the adjusted by moving the furrow openers. For operation, the seeds and fertilizer

are fed by the operator manually in funnels, which flow to the bottom of the furrow openers and in the boot attached to the rear of shank respectively. Since the drill does not have a separate hopper, seeds have to be carried separately in a bag slung on shoulder or the back of the operator.

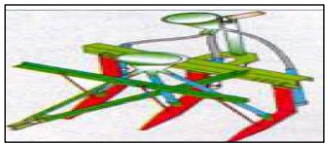

Figure 2.6.1:Animal Drawn Seed Cum Fertilizer Drill

2.7. Animal Drawn Tool Frame for Seeding

It is attachment made for the bullock drawn CIAE multipurpose tool frame. The seeding attachment is suitable for sowing wheat, gram, pea, soybean, sorghum and pigeon pea. It can apply the granular fertilizers like urea, DAP and Grow more. The hopper has compartments for fertilizer and seed and the ground wheel is a floating type thus enabling uniform seed placement even when the soil surface is not properly leveled. Separate side wheels allow the accurate adjustment of the seed drill attachment and are also useful for transportation. It saves 73 per cent labor and operating time and 55 per cent on cost of operation compared to conventional method of sowing behind country plough or seeding by broadcasting. It also results in 10 to 18 per cent increase in yield compared to sowing by conventional method.

Figure 2.7.1:- Animal Drawn Tool Frame for Seeding

2.8. Animal Drawn Single Tyne Seed Cum Ferti Drill

It is a single row line-seeding device drawn by a pair of bullocks. The drill consists, of a channel section made from flat iron and bent to the required profile, a shoe type furrow opener having wings under the frame, hitch assembly made of flat iron, handle attached to U section frame, funnels for feeding seeds and fertilizers and steel pipes for connecting the funnel to the shoe. The beam for connecting to the yoke can be adjusted with the help of multiple holes provided in the frame. For operation the seed drill is drawn by a pair of bullock and the seed and fertilizer are placed by the operator in the respective funnels. Since the drill does not have a separate hopper, seed shave to be the carried separately in a bag slung on the shoulder or the back of the operator.

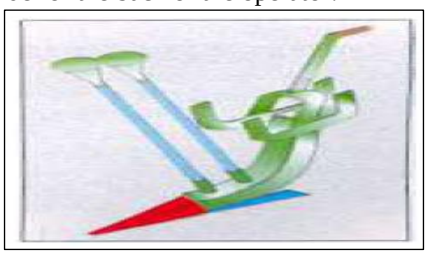

Figure2.8.1:-Animal Drawn Single Tyne Seed Cum Ferti Drill

3. PROPOSED WORK

In this machine a solar panel is used to capture solar energy and then it is converted into electrical energy which in turn is used to charge 12V battery, which then gives the necessary power to a DC geared motor. In this project four DC geared motors are used. First motor is connected to the seed feeder mechanism which provides power to seed feeder mechanism. When this motor rotates, the seed in hopper fall on the soil. When machine change the direction, the rod of seed feeder is moving upward and motor stop to rotate. Due to this reason a rod comes in between seed feeder and seed stop to fall. When this contact of seed mechanism

touches the soil then and only then seed falls on the soil. Otherwise seed falling will stop. Power is then transmitted to the back wheel through crown and pinion. For the reverse and forward mechanism and one motor is used for the function of steering arrangement. i.e. front wheel operation. One small motor is used on hopper to rotate the small wheel on hopper for seed falling in the whole of seed hopper.

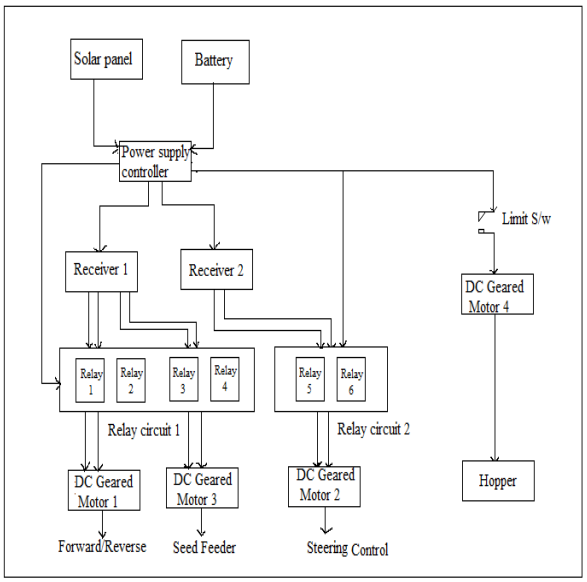

Figure 3.1:-Block Diagram of Solar Powered Seed Sowing Machine by using Remote Contol.

Consequently, in this project an attempt is made to make the electric and mechanical systems share their powers in an efficient way. Solar energy is the first used to charge a storage battery. An electric battery is the device consisting of one or more electrochemical cells that convert stored chemical energy into electrical energy. The solar energy stored in the battery is utilized to operate DC geared motor. A DC geared motor is a device that converts direct current (electrical energy) into mechanical energy. In this project, there are four DC geared motors. By using the crown and pinion with sprockets power is transferred to the wheels for their movement.Remote is used to automatically control the machine. This is having four key buttons. Each button is having their own function. First button is used to move the machine forward, second button is used to move backward, third button is used to left and fourth button is used to move right direction. Any two buttons are used to start and stop the machine operation by matching the frequency of RF sensor. RF Sensors are fitted to the machine for automatic turning operation and to sense the obstacle in the moving path. An RF sensor is an electronic instrument. Put the seeds and in the box as per its capacity. When the machine will going in forward way, the motion is transmitted to the fluted roller seed cup from sprocket at ground wheel through the chain. The fluted roller seed cup is the having the arrangement of seed cut-off and controlling flap to control the amount of seeds. The seeds will get placed in the furrows through the guide pipes. In this way the seeds are placed in the furrows at proper distance and this machine of maintains the proper row spacing.

4. CONCLUSION

In this way we conclude that our seed sowing machine is efficient, pollution free, labour requirement is less, operate on solar energy and remote control . Hence after comparing the different method of seed sowing and limitations of existing machine, it is concluded that the multi-purpose seed sowing machine can

- Proper utilization of the seeds and fertilizers can be done with less loss.
- Perform the various simultaneous operations and hence saves labor requirement, labor cost, labor time, total cost of saving and can be affordable for the farmers.

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