

Fabrication of seed sowing with weed cutter

Ashok U

Mechanical, KPR institute of engineering and technology
Coimbatore, India
ashokeng58@gmail.com

Ajeeth kannan R

Mechanical, KPR institute of engineering and technology.
Coimbatore, India.
ashokunnikrishnan@gmail.com

Abstract: *The proposed system attempts to sow seed in the field without engine and sowing system. The material used contains less carbon and is less expensive; being of softer metal it is easily welded. The main objective of sowing operation is to put seed and fertilizer in row at desired polluting the environment. Mild steel is used as the material for the fabrication of seed depth. It also reduces human power and controls pollution. The mechanism used in this fabrication are chain and sprocket mechanism which is used to transmit power. In current scenario due to heavy weight of trackers soil erosion is taking place this model could be a good alternative. This developed model is economical with good accuracy. This proposed model is accurate and could be deployed in real time environment.*

Keywords: *Seed sowing; Fertilizer; Soil erosion; Chain and sprocket*

I. INTRODUCTION

Practicing Agriculture at low cost and high yield is the major aim of many of the farmers. And this system will satisfy the need of farmers. Steel have emerged as a structural material due to their low density coupled with lighter weight. Use of Mild Steel could result in lighter weight whole system. There is no fuel consumption and gaseous emission. Most of the house hold properties are made of Mild Steel due to their low cost. Due to Mild Steel's cheap cost entire setup is cheap. It is necessary to know the properties and characteristics in order to select right material for the required application. In this chapter overview of Mild Steel is presented.

II. INTRODUCTION TO MILD STEEL

A. mild steel

Mild steel refers to the low carbon steel, typically AISI grades 1005 which are used for structural applications with too little carbon content. As the carbon percentage content rises steel has an ability to become harder and stronger through heat treating. High carbon content reduces weld ability. Mild Steel has no more than 1.6% of manganese, 0.6% of silicon are 0.6% of copper. Mild steel is available with varying level formability. The formal grades are typically

more costly than the less formable grades also called carbon steel.

General purpose of steel bars for machining, suitable for lightly stressed component including studs, bolts, gears and shaft. Bright drawn mild steel is an improved quality material, free of scale and has been cold worked.

B. Mechanical properties of mild steel

Table 1: Mechanical properties steel

PROPERTY	GRADE
Tensile strength (kgf/mm)	350 to 450
Yield strength (kg/mm)	240
Elongation	25
ECv (for 2.80-3.15mm thickness)min	13.5

C. Chemical properties

Table 2: Chemical properties

Constituent	Percent
Carbon, max	0.16
Manganese, min	0.30
Silicon, max	0.25
Phosphorous, max	0.030
Aluminum, min	0.02
Sulphur, max.	0.030

III. HISTORY OF SOWING

From past days there were several innovations in agriculture and methods used are different types:

A. Traditional tool

The tools used traditionally for sowing seeds is shaped like a funnel the seeds are filled in funnel and they go down from two or three pipes having sharp ends the seeds which are gone place into soil it is sown by bulls.

B. Seed drilling

Nowadays the seeds drill is used for sowing with the help of tractors these type of machines help in place the seeds in proper distance and depth with use of this machine the seeds get covered by soil and the crop is avoid to overcrowding of plants to get sufficient water , sunlight ,nutrients from the soil.

Bulls wear used for agriculture because the weights of the instruments are heavy. They do not use artificial fertilizers .The product from the field do not affect humans .but the yield time is to vast which is disadvantage in this method.

IV. TYPES OF SOWING

In India sowing is carried out in two types from ancient times they are practiced according to the need of farming and drilling is the type of sowing that we are going to process thorough the project

A. Broadcasting

A field is initially prepared with a plough to a series of linear cuts known as furrows. The field is then seeded by throwing the seeds over the field, a method known as manual broadcasting. The result was a field planted roughly in rows, but having a large number of plants. When the seeds are scattered randomly with the help of hand on the soil, the method is called broadcasting.

B. dribbling

Drill sowing and dribbling (making small holes in the ground for seeds) are better method of sowing the seeds. Once the seeds are put in the holes, they are then covered with the soil. This saves time and labor and prevents the damage of seeds by birds.

Another method of sowing the seeds is with help of a simple device consisting of bamboo tube with a funnel on it attached to a plough. As the plough moves over the field the tube attached to it leaves the seeds kept in the funnel at proper spacing and depth. The plough keeps making furrows in the soil in which the seeds are dropped by the seed drill.

V. CHAIN AND SPROCKET

A sprocket or sprocket-wheel is a profiled wheel with teeth, which mesh with a chain. The name sprocket applies generally to any wheel which has radial projections that engage a chain passing over it. It is different from a gear in such a way that sprockets are never meshed together directly, and varies from a pulley in that sprockets have teeth and pulleys are smooth

Sprockets are used in bicycles, motorcycles, tracked vehicles, and other machinery. They are used to transmit rotary motion between two shafts where gears are unsuitable. The most common form of sprocket is found in the bicycle and motorcycle, in which the pedal shaft carries a large sprocket-wheel which drives a chain which in turn drives a small sprocket on the axle of the rear wheel.

Sprockets are of various designs. Sprockets do not have a flange. Some sprockets used with belts have flanges to keep the timing belt centered. Chains and Sprockets are also used for power transmission from one shaft to another where slippage is not admissible, Chains being used instead of belts or ropes and sprocket-wheels instead of pulleys. It can be run at high speed and some forms of chain are so constructed as to be noiseless even at high speed.

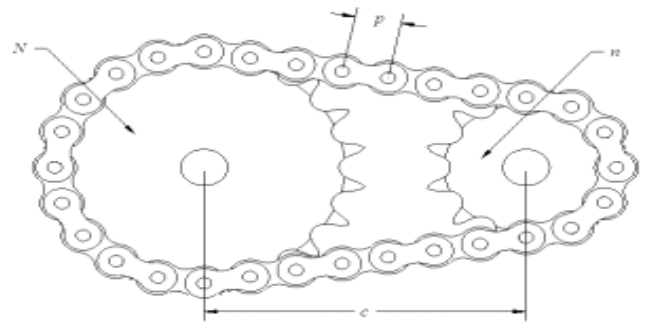


Figure I: chain and sprocket

VI. LITERATURER REVIEW

Under intensive cropping, timeliness of operations is one of the most important factors which can only be achieved if appropriate use of agricultural machines is advocated. Manual method of seed planting, results in low seed placement, spacing efficiencies and serious back ache for the farmer which limits the size of field that can be planted. To achieve the best performance from a seed planter, the above limits are to be optimized by proper design and selection of the components required on the machine to suit the needs of crops.

A. Adisa and braid (2012)

Hand-pushed and Transnational Journal of Science and Technology August 2012 edition volume2, (usually single and multiple row).Has modeled an agricultural instrument for seeding in parallel normally requires a well prepared seed-bed which may be ridged or flat bed. In the past, various types of design have been developed with different design approaches which have their advantages and disadvantages and also operation a limitation. Adisa and Braid (2012) designed and

constructed a manually operated flute planter/fertilizer distributor which was found to be 94% efficient in seed spacing but could not be used on the ridged seed bed and requires quite some effort and time to change seed drill size and seed spacing.

B. Braid and njidda (1989)

Developed a combined jab planter which was found to be 73.4% efficient and was three times faster than manual planting with hoes and cutlass. Made use of the principle of jab planter in applying fertilizers.

C. Adekoya and buchele

Developed a cam activated precision punch planter which was capable of planting an untilled soil. Developed a transplanted for some selected crops in Guinea Savannah of Nigeria which has 0.19ha/h field capacity and 20% field efficiency. All of the above designs were reported to have got quite promising results.

VII. PURPOSE OF SEED PLANTER

The basic objective of sowing 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. The recommended seed to seed spacing and depth of seed placement vary from crop to crop and for different agro-climate conditions to achieve optimum yields

VIII. FACTORES AFFECTING

Mechanical factors, which affect seed germination and emergence are, Uniformity of depth of placement of seed. Uniformity of distribution of seed along rows. Transverse displacement of seed from the row. Prevention of loose soil getting under the seed. Uniformity of soil covers over the seed. Mixing of fertilizer with seed during placement in the furrow.

To achieve the best performance from a seed drill or planter, the above factors are to be optimized by proper design and selection of the components required on the machine to suit the needs of the crops. The seed drill or planter can play an important role in manipulating the physical environment

A. mechanical factore which affect seed

- Seed damage during metering.
- Uniformity of depth of placement of seed.
- Uniformity of distribution of seed along rows.
- Transverse displacement of the seed from the row.
- Prevention of loose soil getting under the seed.
- Degree of soil compaction above the seed.

IX. SEED PRODUCTION BY PRIVATE SECTORE

Seed production by private sectors starts from the procurement of breeder seed from State Agricultural Universities and ICAR Institutions. Then the seed is cultivated by private sector or by contract growers with proper supervision of Orissa State Seed Certification Agency personals which is a third party certification agency of the state department of agriculture. The seed after harvesting is cleaned and graded. If germination of seed is acceptable as per seed certification standards, the OSSCA certifies the same for sale seed as certified seed.

The multiplication of seed chain starts from nucleus seed. This is then successively multiplied to breeders, foundation and certified seed, truthfully leveled seed with later being sown to produce commercial crops. In all this stages the quality control is paramount importance, as it is essential that trueness to type of variety be maintained. The company plans to procure foundation seeds from Agricultural Universities/NSC/SSC to support its certified seed production programmed. Seeds of this stage are available from these agencies on placement of indent in advance.

X. METHODOLOGY

Experiments are planned to sow seeds on field. It is a sowing process done on dry agricultural area with the fabrication made on mild steel. When the system is pulled, the front part of the fabrication makes way for the seeds. Then the wheel moves on pulling and the shaft which is mounted by the wheels starts rotating. Then the chain and the Sprocket is used to connect Shaft and Sprocket at the top which is connected to the roller.

XI. WORKING

This is a small manually operated single row seed cum fertilizer drill in which fluted roller metering mechanism is provided. A ground wheel is provided to drive the metering rollers. Seed and fertilizer are stored in a small hopper and a long beam is provided by which the implement could be pulled by one operator. Another worker guides the machine. Due to the provision of fluted rollers, it is suited for drilling soybean maize, pigeon pea, sorghum, green gram, Bengal gram, wheat etc. Shoe type furrow openers are provided for easy operation.

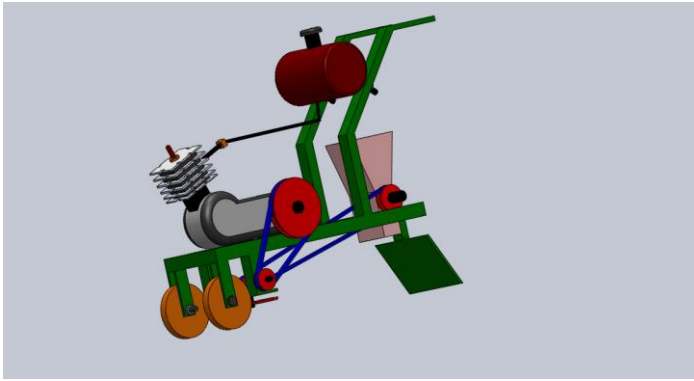


Figure II : 3-d view

XII. CONCLUSION

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.

Acknowledgment

We wish to express our sincere thanks to our beloved chairman **shri.K.P.RAMASAMY** providing us an opportunity to carry out this project.

We admit thanks to **Dr.S.Bommannaraja** for giving us such an encouragement for doing this project.

We are also grateful to **Dr.T.Lakshmanan**, for providing us with necessary facilities during the course of work.

We welcome this opportunity to express our heartfelt and regards to our guide **Mr.A.P.JUNAI DH** Assistant Professor for his kind guidance and encouragement during this project. He always bestowed parental care upon us and evinced keen interest in solving our problems.

We wish to pass our gratitude to all teaching staff of mechanical department for their valuable suggestions for our project and for successful completion.

References

- [1]. Georges, F. (1968). U.S. Patent No. 3,412,908. Washington, DC: U.S. Patent and Trademark Office.
- [2]. Powilleit, H. (1986). U.S. Patent No. 4,628,841. Washington, DC: U.S. Patent and Trademark Office.
- [3]. Ribouleau, M. (1990). U.S. Patent No. 4,949,869. Washington, DC: U.S. Patent and Trademark Office.
- [4]. McClelland, P. D. (1997). Sowing modernity: America's first agricultural revolution. Cornell University Press.
- [5]. Jupiter, D. (2004). U.S. Patent No. 6,834,598. Washington, DC: U.S. Patent and Trademark Office.
- [6] WU, C. Y., JIN, C. Q., TU, A. F., LU, Y., & WANG, L. Q. (2004). Some Important Problems need to be solved on Irrigating-sowing Machines in China [J]. Chinese Agriculture Mechanization, 6, 006.