Design And Fabrication Of Sugar Cane Seeding Machine

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Abstract—In recent time there has been tremendous rise and development in industrial as well as agricultural sector. To increase the production without harm to the soil the farmers have invented various techniques. The traditional method of farming is now replaced by advanced technique. This paper deals with the comparison between traditional sowing method and new proposed machine which can perform simultaneous operation. Though in market advanced cane seeding machine are available but they uses the tractor power for the operation. Thus this leads to pollution and it is costly.

Keywords—agriculture, machine, low cost, planting ,tractor

1.INTRODUCTION

Agriculture is one of the most important and developing sector of Indian economy. One third of India's population relay on agriculture for living. 43% of India's geographical area is covered by agriculture. India is largest country which produces sugar from sugarcane. After Brazil, India is second largest country for production of sugarcane. 7% of agriculture sector is shared by sugarcane. Today's world required faster production in less time. In India agriculture faces problems such as scarcity of

labor, not only in working seasons but also in normal time. Sugarcane is the world largest crop, in 2010 it was cultivated on about 23.8 million hectares in more than 90 country's . the cane seeding machine must be suitable to Indian condition and it should increase the productivity of sugarcane by introduction of mechanism an uniformity in planting without wastage of canes.

The main objective of sowing operation is to put the cane in rows at desired depth as spacing, covering the cane with soil. The standard row to row spacing, cane rate, cane to cane spacing and depth of cane placement vary from different agricultural and climatic condition to achieve desired yields and an efficient sowing machine should attempt to fulfill the requirements. In addition, saving in cost of time, labor and energy are other advantages to be used to improve machinery such operation.

Fig1- Traditional method

3. OBJECTIVE

1. To manufacture cane sowing machine this can be operated by the single operator.
2. To set fertilizer with sowed cane.
3. To level the ground in small extent
4. To enable the machine for the sowing of several of cane like maize, wheat etc.
5. To maintain the same distance between two cane at the time of sowing process.

4 .DESIGN AND CALCULATION CUTTING AND FEEDING

   For cutting calculation of cane seeding machine we assume speed of tractor 5km/hr and gear ratio between wheel and cutting blade is 6 from that we have to find number of pieces cut in 1hr.also we have to find distance between two successive pieces

Speed= V=5 km/hr

   = 5000 m/hr

Gear ratio between main axle and cutting blade = G_1=6
Main wheel diameter =58 cm=0.58m

Perimeter = P =$2\pi r$

   =$2\times\pi\times(0.58/2)$

   =1.82 m

Rotation of main wheel in per minute

   N_1 = 5000/1.82×60 N_1= 45.78 rpm

   =46 rpm RPM of cutting blade shaft

   N_2 = $N_1 \times G$
      = 46×6

   N_2 =276 rpm

Cutting of sugar cane by blade per minute no.of blade =4 Sugar cane piece = $N_2 \times 4$
                                                   =138×4

   =552 Pieces /min

Gear ratio between main wheel axle and timing wheel axle is
                                                   =1

      G_2 =1.50
 Perimeter of timing wheel P =120 cm

   r = p/2 ×3.14 =19 cm

  D_2 =38 cm

  G_2= D_1/D_2 =1.50
  RPM of timing wheel N_3 = $G_2 \times N_1$
      = 46×1.50
      = 69 rpm

   Gear ratio between timing wheel axle and cane   feeder shaft is 1.
 So,rpm of cane feeder and timing wheel is same N_3= N_4= 69 rpm
 There are 8 pockets to each cane feeder Sugar cane pieces feed or drop per minute
 Cane pieces drop / min =8×69 =552 pieces/min Hence, distance between two successive cane pieces is ,

 d = 83.72/552
       = 0.1516 m
       = 0.15 m

                    Timing wheel diameter : G =1.5
      D_1 = 0.58m D_3 = ?

  D_3 =D_1/G =0.58/1.5
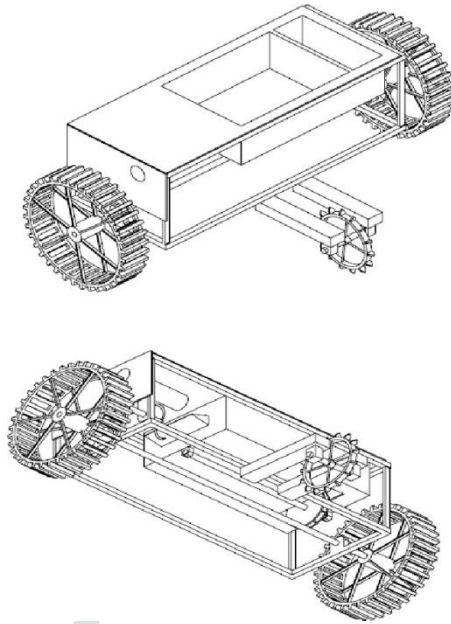   = 0.3866m

5. METHODOLOGY

Fig2-cane seeding machine

These mechanism performs simultaneous operation. It furrows the soil, it cuts the cane, it lays the cane in soil, closes the soil ones the cane is placed in soil. As these mechanism does not uses the tractor power for cutting, it uses the rotating power of wheel for cutting. When the wheels rotate as tractor moves forward the power is transmitted to the shaft. The shaft is attached with a chain drive mechanism. Which then transmit the power to another shaft to which the cutting blade is attached. The timing wheel is attached which sets the timing of cane to be sowed in the soil.

VI .SCOPE

Cane sowing machine is a device which helps in the sowing of canes in the desired position hence assisting the farmers in saving time and money. So considering these points related to spraying and cane sowing is an attempt is made to design and fabricate such equipment which will perform both the operation more efficiently.

- Work reliable under different working condition.
- Decrease labour cost by advancing the spraying method

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