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DEVLOPMENT OF SEED SOWING MACHINE USE IN GREEN HOUSE

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Abstract

Today era is the machining and rapid growth in all sector including with agriculture sector. The sources of livelihood agriculture remains the largest sector of indian economy. The growth of agriculture is about 3% to5% since 1970-71 and today is not good. Today population also increses and climate changes so farming is not easy.To meet the future food demand the farming technology can be increses,so various seed sowing method used in india for seed sowing and fertilizing and slowly growth in agriculture technology is the aim our project.The nethod normal seed sowing (we can say that used 10 year ago method)and today seed sowing which can perform the number of simultaneous opration. day by day more labour are found in farming and more cost required on labour/day. So this machine reduced effort ,cost of seed sowing.

Keywords: Seed,Vaccum Pump,Seed Sowing In Fram,Nurseries,pneumatic

I. INTRODUCTION

Concrete is most widely used construction material in the world due to its ability to get cast in any form and shape. India is famous for farming.70% people can be farming or farmer .so india also called as 'krushipradhan desh''. So many family depend upon the farming .only farming is income source. agriculture is the back bone of indian economy and it will be continue to remain so far a long time. farming support about 20%world population from 2.3% of geographical area and 4%world's water resources ,so farmer is important to us. Some challenge they face like agriculture security , labour ,not only peak season's but also normal time.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.

Seed sowing machine using vacuum Journal of Science and Technology August 2012 was found to be 73.4% efficient and was three times faster than manual planting with hoes and cutlass. Abubakar (1987) made use of the principle of jab planter in applying fertilizers. developed a cam activated precision punch planter which was capable of planting an untilled soil. Braide and Ahmadu (1990) developed a transplanter for some selected

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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.

III. NEED OF PROJECT

There is need to make machine to perform the following operation.

1. Seed sowing easy without any manually help.
2. Less time require .
3. Fertilizer placement.
4. Fast propagation crop from seed.

III. OBJECTIVE

1. Proper seed placed.
2. Effort less.
3. Not require any labour cost.
4. Plant effiiciency increses.
5. Profit in less time.

IV. CONSTRUCTION AND DESIGN PART

Part content in seed sowing machine-

1. double acting cylinder.
2. vacuum pump.
3. 5/2 control valve.
4. belt and pulley.
5. stepper motor.
6. nozzle
7. flexible and connecting tube.
8. electronic part.

V. DESIGN AND CALCULATION

1.Material selection

The main goal of material selection is cost minimization and meeting the product performance goal. Cost of materials plays a very significant role in their material. Cost of materials plays a very important role in their selection. We initially considered various materials for building of the PT such as mild steel, aluminium, stainless steel etc. we are consider there properties of any material.

2.Vaccum pump –

Mostly pump are work on the Bernoulli's principle. Due to vacuum pump sucked by nozzle .the nozzle diameter is less than the seed diameter. So nozzle selection is also important.

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3.Motor -

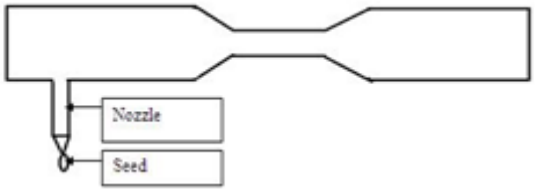
Choosing a motor that is suited to the task at hand is one of the most important part of planning arobotics project. There are categories of electric motors that are used in practical application and are easily available for purchase. They are: Conventional DC motors, Stepper Motors, Servo Motors,

We have selected motor on the basis of torque requirement and the cost.

So we select the stepper motor because of following reason

1.They actually send position singnal (four wire)

2. most sophisticated of a move can be achieved. Means repeat motion can be esily achieved .and exactly know where the motor is located and have to it return to a "home or start" position precisely.



1.Area of nozzle-

Diameter of seed = 6.3 mm …….. (from measurement using vernier caliper)

$A = \pi/4 \times d^2$

$= \pi/4 \times (6.3)^2$

$= 3.11\ mm^2$

Mass of seed is measured by using electronic weighing machine which is given as follows

Mass of seed = 0.1 gm

Weight = 0.1 × 9.81 = 0.981N

Force required (F) = weight

= 0.981N

We know that

Pressure = force/area

= 0.981/3.11

= 0.3154Mpa

selected Vacuum Pump having operating pressure of **0.1-0.4** Mpa

2. Motor Calculation:

W= 100 gm

R= reaction to w

μ (coeff. of friction)= 0.76 …(assumed)

F (frictional force)= μR

0.76 * (0.1 * 9.81)

F = **0.7455 N**

d (dia. Of pulley) = 42mm = **0.042m**

Now, required torque to rotate pulley is given as,

T = F X d

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= 0.7455 X 0.042

T = 0.0313 Nm

So we selected optimum performance, motor selected as- 0.5096 Nm torque

3. Pneumatic cylinder

Assumptions

Stroke= 25 mm

mass of seeds = 0.001 kg

mass of nozzle and mounting assembly = 0.5kg

total weight= (0.001+ 0.5) x 9.81 = 4.91 N

Pressure = 2 bar

Pressure = total weight/ Bore area

$= 2*10^5 = (4.91)/ \text{Area}$

Area = 0.0000245 m2

therefore,

$\text{Diameter}^2 = 0.0000245*0.785$

Diameter = 0.005586 = 5.5 mm

So Cylinder selected form standard chart

Stroke 25 mm

Bore dia. 10 mm

4. Motor Speed Calculation-

We know that power of motor

V=12v ,A=4.2amp

POWER=0.0504kw

$P=2\pi nt/60$

0.0504=2*3.14*N*0.0313/60

N=15.37=16rpm

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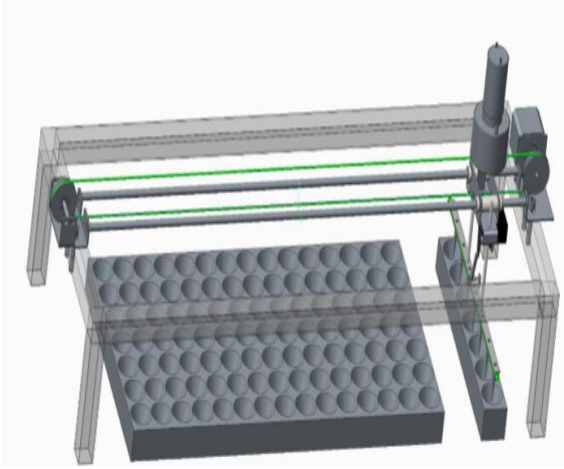
Sr No.	Name of Part	Description	Qty
1	stepper motor	2.5 v, 2.5 amp motor	1
2	suction pump	12 v	1
3	dcv	4/3 solenoid operated	1
4	pulley	Aluminium 42 mm dia	2
5	injectors	depends upon seeds	7
6	guide	En 8, 10 mm dia	2
7	pneumatic cylinder	100 mm stroke	1
8	pneumatic hoses	6 bar pressure line	1

VI. DIAGRAM OR CAD MODEL

1. Seed Sowing Machine



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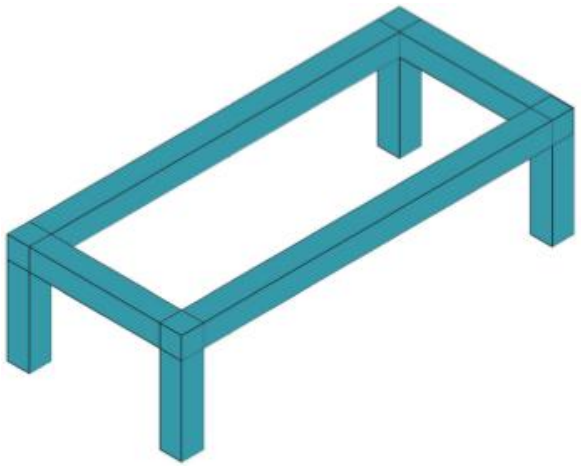
2. Frarme



3. Actual Base (Frame)

4. Cylinder and Nozzel Assembly

VII. CONCLUSION

As the existing problem regarding the availability of machine at low cost, workers availability and wastage of seeds in agriculture sector are eliminated with the help of Automatic seed sowing machine. Also area consumed by Automatic seed sowing machine is very less that allows the machine to work easily. Precise placing of seed also helps in proper growth of plant..

VIII. FUTURE SCOPE

We can use large no. of nozzle for increasing productivity as well as time consuming. .PLC can be used for the Automatic seed sowing machine for large scale plantation. In future Spraying jet nozzle can also connected to

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seed soiling machine to kill insecticides. In the base of frame wheels can be provided to the machine which will be helpful for the easy transportation of machine

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REFERENCES

[1] A.Kannan, K. Esakkiraja, S. Thimmarayan "Design Modifications In Multipurpose Sowing Machine"

[2] Ranjeet Kumar, Sirisha Adamala, Yogesh Anand Rajwade and Harsh Vardhan Singh, "Performance evaluation of a tractor mounted pneumatic planter for sorghum in dryland" African Journal of Agricultural Research Vol. 10(39), pp. 3767-3772, 24 September, 2015 DOI: 10.5897/AJAR2015.10048 Article Number: 2A8212955580,

[3] Roshan V Marode, Gajanan P Tayade and Swapnil K Agrawal1 "Design And Implementation Of Multi Seed Sowing Machine" IJMERR ISSN 2278 – 0149 www.ijmerr.com Vol. 2, No. 4, October 2013

[4] Shaaban UA, Afify M T, Hassan G E, El-Haddad ZA " Development Of A Vacuum Precision Seeder Prototype For Onion Seeds", Misr J. Ag. Eng., 26(4): 1751 - 1775 Farm Machinery And Power.

[5] ACI Structural journal paper Title no.103-S74 by Carlo Pellegrino and Claudio Modena - Fiber-Reinforced Polymer Shear Strengthening of Reinforced Concrete Beams.

[6] Atul B. Ekad, Sonal N. Salunke, Sunaina B. Gawde, Archana K. Said, Prof. G. L. Suryawanshi, " Design and Development of Pneumatically Operated Automatic Seed Sowing Machin", IJIRSETVol. 5, Issue 7, July 2016.