



INTERNATIONAL JOURNAL FOR ENGINEERING APPLICATIONS AND TECHNOLOGY

THREE IN ONE AGRICULTURAL MACHINE : A REVIEW

Mr Shubham G. Fender¹, Mr. Pranay D. Mannarwar², Mr. Ruchik R. Vyawahare³

¹STUDENT, Department of Mechanical Engineering, Jawaharlal Darda Institute of Engineering & Technology Yavatmal, Maharashtra, India, shubhamfendar97@gmail.com

²STUDENT, Department of Mechanical Engineering, Jawaharlal Darda Institute Of Engineering & Technology Yavatmal, Maharashtra, India, pdmannarwar31@email.com

³STUDENT, Department Of Mechanical Engineering, Jawaharlal Darda Institute Of Engineering & Technology Yavatmal, Maharashtra, India, ruchikv69@email.com

Abstract

India is an agriculture country in which the 70 % the people that depend on the farming source but in case of our observation the population get increases day by day due to which the farm get distributed among the family that's why the india held in average few acres of farm. Due to economical condition of indian farmer they cant afford or purchase high cost farming equipment such as tractors that's why indian farmer refer to use their traditional methods for farming. They done their farming operation by using bullock and he-buffalo. It should not satisfied actual need of energy requirement so we are about the human and animal efforts can be replace by some machine using mechanization that will be suitable for our farmer. In this machine we have attachment- deattachment accessories.

The Three in one agriculture machine is the machine to do the maximum work in short time as we doing the three work at a time we save the time money and efforts of our farmer. These three works are spraying sowing and cultivation that will be done at a time .So it is manually operated machine to perform various operations in less time and economically.

Index Terms: seed sowing ,pesticides ,spraying , cultivation , multi operation ,etc

1. Introduction

India is a present country which an agriculture based with nearly 70% of population of india is very much dependant on farming either directly or indirectly. In india most of farmer attempt suicide ,As in india 10-20% farmers are rich but rest of farmer doesn't have much source to purchase heavy equipments and machines. Sowing is the important and tedious activity that which perform initially in the farm. Pesticide spraying activity is done when insects grow on the crop.and cultivation is done when small grass is coming from the land. The spraying ,sowing and cultivation these are the very most important process in the farming In india farmer can done spraying, sowing, and cultivation by three different machines but by using this machines farmer will have been done these three activities at a time by using this machine . the Three in one agriculture machine is the special type of

machine to do the work in time and save the time and also it save the money by using the one machine instead of three.

2.Literature survey

(1)David D. Wilson and John H. Lumkes [2015]in this paper authors have used certain multi purpose machine with the help of this paper we were able to drive our attention to broader way to how attachments can be used for making a model more useful in efficientand sustainable way

(2)P. Šařec, O. Šařec [2015] The lowest values of soil penetration resistance below the cultivated profile were determined with the cultivators equipped with chisel shaped shares i.e. in the case of Farmet and Köckerling. Cultivators Väderstad TopDown 400 and Farmet Turbulent 450 showed good capacity in embedding plant residues. This results have taken for our research basis .

3. Concept Design of Machine

The concept is taken for the project for poor farmers. And in one machine multi operation should be performed with at lower cost as compared to other agriculture machine. For this machine skilled person would not be required. The mechanism in machine is used is very simple so, that is very useful for the poor farmer.

4. Function

1) Cultivation 2) Sowing 3) Spraying

5. Constructional Details

Multipurpose farming machine consist of following components

- 1) Chassis frame 2) Sprayer 3) Hopper 4) Fertiliser tank
- 5) Chain 6) Wheel 8) Cultivating tool 9) Bearing

5.1 Chassis Frame

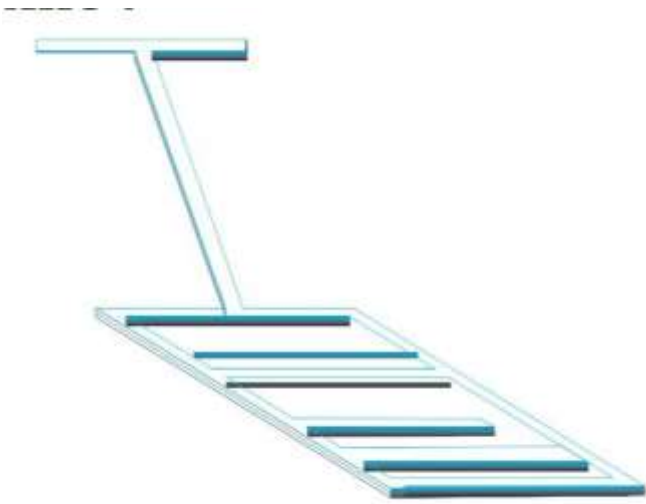


Fig: Chassis Frame [9]

- The chassis is to be main structure of our machine. In which on the chassis the component of machine is mounted. The chassis holds the whole parts of machine that we perform multiple operation that we included in this machine. On the chassis the mechanical parts like shaft, bearing, wheel, plastic gear, hopper, spray pump are bolted on chassis.
- A chassis is a structure as like automobile vehicle on which fixes the whole body. It is like analogous to the animal skeleton . If we attached wheel to the chassis then it is described as a rolling chassis

5.2 Hooper

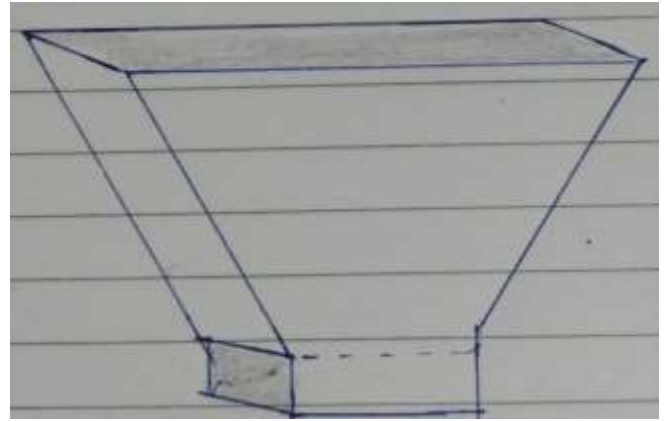


Fig: Hopper [9]

Hooper is used to store the granular seeds for temporary purpose in which it restrict the flow of seeds and as we sowing the seed whenever we required. The hopper is attached on the backside of the chassis

5.3 Cultivating tool



Fig: Cultivation Tool

- The tool is connected back side of the chassis that is between the two rear wheel and that is operated by manually.

6. Working of machine

- India is a country where farming is main occupation and culture then also in India most of farmers attempt suicide reason behind this is machine , as in India 10-20% of farmers are rich but rest of farmers don't have much source to purchase heavy equipment and machines. So we have decided to design a machine

which can fulfill basic need of farming and price of machine should be very less as compared for market. Main objective of machine is fertilizer spraying, seed sowing & cultivating. For solving this purpose we have designed this type of machine.



Fig. Three in one agriculture machine

- Cultivating tool is easily assemble and dissemble. This operation is done by the manual force .
- For spraying operation the rod will be connected to the fluid tank and this has got the motion from shaft which connected between the bearings and that shaft is run by the chain sprocket which is actually connected to wheel. Due to this it get circular motion and that circulation motion converted into reciprocating motion which is the connecting rod to the pump get up and down motion.
- We have used the hopper for sowing the seed and that hopper is connected by the chain and that chain connected to the wheel due to this hopper get and handler can sowing the seed.
- Cultivating tool is detachable component of machine which can be attached at the end part of machine when cultivating has to be done.

7. Advantages

- Easy in construction.
- More economical.
- Easy to clean and maintain.
- It does not create air pollutant & noise
- Easy to handle.
- Do not require fuel hence cost reduce & Light in weight.

8. Conclusion

Three in one agriculture machine can perform multi operations like cultivation, pesticide spraying and sowing. Three in one agriculture machine is a single system which contains multi attachments and can be easily assembled and disassembled comfortably. The machine can do the work of four labours a day which reduces the labour cost of the farmer. The time required by three in one agriculture machine is very less as compared to the sum of time required to perform all three tasks individually. Such a type of human operated machine helps to get maximum improving production in the farm and that increases the profitability of poor farmer. This machine is totally manual operated so this machine no required more human power as compared to other traditional method. It is not required any type of fuel so it is very useful for poor farmer .

FUTURE SCOPE

- We can add solar panel for spraying system
- More equipment like soil testing tasks could be added to this project
- The Solar panel unit could be enhanced in order to generate more prolonged electric supply. Moreover the electricity could be stored; to be used at night or in no sun condition.

REFERENCE

- [1]. Prof. Swati D.Kale, Swati V. Khandagale, Shweta S. Gaikwad, "Agriculture Drone for Spraying fertilizer and pesticides", "International journal of advance research in computer science and software Engineering", volume 5, Issue 12, (Dec-2015)

- [2]. S.R.Kulkarni, Harish Nayak, Mohan Futane, "Fabrication of portable foot operated Agricultural Fertilizer and pesticides spraying pump", "International journal of Engineering Research and technology", ISSN:2278-0181,volume 4 ,Issue 07(July-2015)
- [3]. Aditya Kawadaskar, Dr. S. S. Chaudhari "Review of Methods of Seed Sowing Concept of Multi-Purpose Seed Sowing Machine", International journal of pure and applied research in engineering and technology, 2013; Volume 1(8): 267-276.
- [4]. A. R. Kyada & D. B Patel, DEC 2014 "Design And Development Of Manually Operated Seed Planter Machine" of Lecture 5th International & 26th All India Manufacturing Technology, Design and Research Conference (AIMTDR 2014) , IIT Guwahati, Assam, India. Vol 2
- [5]. 8. A.Kannan , K. Esakkiraja , S. Thimmarayan, JAN 5014 "Design And Modification Of Multipurpose Sowing Machine" VOL:2 ,ISSN (ONLINE): 2321-
- [6]. Dr. C. N. Sakhale "A Review Paper on Farming Machine", IJRST –International Journal for Innovative Research in Science & Technology| Volume 3 | Issue 06 | November 2016 ISSN (online): 2349-6010. 3051.
- [7]. Prof. SWAPNIL L. KOLHE, NILESH B, GAJBHIYEVIVEK B, DESHMUKH, "Eco Friendly Mechanically operated Multipurpose Spray Pump" International Journal of Research in Advent Technology, Vol.2, No.2, February 2014 E- ISSN: 2321-9637
- [8]. Vern Hofman, Elton Solseng, "Spray Equipment and Calibration", Agricultural and Biosystem Engineering, North Dakota State University, Sept 2004.
- [9]. Dr. C.N.Sakhale PROF. S.N.Waghmare ,A Review paper on "MULTIPURPOSE FARM MACHINE",