Fatigueless Powder Fertilizer Dropper

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Abstract - *Most over soils have been used for crop cultivation for many years without replenishing which has led to low productivity. This is a serious problem and can be solved using fertilizers.*

Key Words: **Powder Fertilizer, Dropper, Fatigue Reduction, Manual system, Economical device**

1.INTRODUCTION

Today we need more and more productivity in farm field. To cope with it, there is huge requirement of fertilizers for crops. Traditionally farmers drop some amount of powder to the base stem root of the crop. Specifically, some crops require powder form of fertilizer. However, for liquid fertilizer there is availability of pump but, for powder form there is no such specific device. So farmers drop some amount of powder fertilizer manually by sitting down at the bottom of the crop. This makes high fatigue to the worker/farmer/labour. In order to overcome this difficulty a product has been developed.

2.OBJECTIVE

The objective of project is to reduce human fatigue. To reduce time of process as compared to traditional process.

3.SCOPE OF PROJECT

1. Saves cost spend on casual workers
2. Reduce time as compared to traditional process
3. Develop an Economical device
4. Reduce farmer fatigue
5. Develop zero maintains cost of device

4.LITREATURE REVIEW

After referring to various papers and research material gathered through various sources multiple mechanism were found that could tackle the problem.

Various solutions devised consisted of automatic as well as pure mechanical system, taking into consideration this factors we began to develop a model/prototype which will be much more economical. For study of various crops that require fertilizer in powder form we visited various farmers in local having different crops to get what should be the quantity of fertilizer to be dropped.

5. CONSTRUCTION

The constructional elements of Fatigueless powder fertilizers dropper are as follows

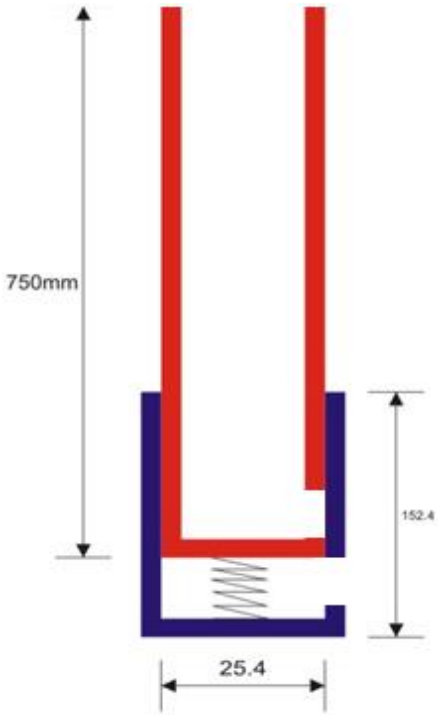
1. Tank
2. Rubber pipe
3. PVC pipe
4. Sliding pin
5. Spring

Tank used in project is basically a piece of bottle which can store some amount quantity of fertilizer estimated quantity that can bare is around 10 kgs the reason we choose a bottle is that, it has funnel mouth for natural flow and pressure. Rubber pipes are

introduced to the project to obtain flexibility in project through which fertilizer passes. PVC pipes used are of 2 dimensions, one is with ¾ inch and another pipe diameter 1inch pipe. PVC pipe was selected as material because it is light in weight and could be held anywhere easily. Also it is non corrosive in nature which is a big advantage. Sliding element used is sliding pin that is nut and bolt assembly. The spring used is of compression type of d=2mm with low tension the diameter of spring is D=24mm and length is L= 75mm.

(1) (2) (3) (4) (5)

MODEL:



The above elements are assembled in such a way that the smaller dia pipe is seated in larger dia pipe so it can slide into it, the sliding pin passed through pipe via slot to constrain the relative motion of pipe and a backthrust is obtained using compression spring placed below.

6. WORKING

In powder fertilizer dropper, fertilizer is filled in tank which almost can store 10 kg of fertilizer. The fertilizer flows down through the flexible pipe, down to plastic pipe and then falls on the ground through outlet. When we exert a force the spring inside pipe compresses and outlet valve opens as a result some amount of fertilizer dumps down at root stem.

7. MECHHANISMS USED

- Sliding Mechanism- It is the mechanism which slides in a constraint area.
- Spring Return Mechanism- A spring is an elastic object that stores energy. It is the mechanism which creates an opposite force.
- Used compression spring- It is an open coil helical spring that offers resistance to a compressive force applied axially.

8. CONCLUSION AND FUTURE SCOPE

Although powder fertilizers thrown by farmers in the fields but in actual it should have dropped into root stem of plants (for specific crops) but no one is capable to do it for long time due to fatigue. Because of this reason we came up with an idea that idea evolved into a new model that can contribute the farmers up to some extent, by reducing their fatigue while carrying out this process. And the result is we developed such a device.

9. REFEREANCES

[1] Gaurav Kulkarni, Shubham Gade, Prasad Kadu, Nilesh Sathe, A.G.Nimbalkar. "Development of Working Model of Fertilizer Feeder for Paddy Field", International Journal for Scientific Research & Development. Vol. 6, Issue 04, 2018, ISSN No: 2321 – 0613.