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Multipurpose Agricultural Vehicle

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ABSTRACT

Agriculture has been the backbone of human existence since time immemorial. It has also seen much advancement over the years. However, the agricultural practices carried out in India are still largely traditional. It is very essential for Indian farmers to discover and implement new ideas in this field. Traditional farming involves methods that include labour for tilling, sowing and harvesting. Irrigation is majorly dependent on rain and seeds used are not modern. Modern agricultural practices use mechanised equipment for irrigation, tilling and harvesting along with hybrid seeds. In India, the agriculture technologies are labour intensive, whereas the modern agriculture technology are mainly capital intensive. Generally, development of any yield includes different advances like seed selection, field preparation, sowing, irrigation, weed removal, pesticide spraying, fruit formation stage, harvesting and threshing. Farmer has to use various agricultural equipment's and labourer's for carrying out those steps which is time consuming and laborers need to be paid thus cost too gets involved. So, our motive is to combine few of these tools to equip farmers with this multipurpose device which implements all the modern farming techniques with minimum cost. This vehicle will help in playing out numerous errands and spare time and work cost will be decreased effectively. Due to scientific agriculture strategies the yield will rise and quality will be improved. The quality will be highly affected because of organic manure as well.

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I. INTRODUCTION

Agriculture has been the foundation of Indian economy and will continue to be so for a while. It is changing the financial condition of the population due to advancement and globalization. About 75% individuals are living in the rural territory are as yet reliant on farming as their primary occupation. About 40-45% of geographical area is used for agricultural activity. As Indian population is growing persistently, the need for creating crop per hector is additionally expanding, this requires efficient, effective and high-limit machines. In this way, automation in agricultural industry plays an important role in Indian economy. The fundamental elements of this vehicle are, to test moisture content in soil, to plough the field thoroughly to increase richness of soil, to remove unwanted grass grown near the crop as it would use the nutrient content that would otherwise be used by the plant, to sow seeds, to add organic manure as a fertilizer which effectively increases yield and spraying pesticides and herbicides for thus protecting the crop from other agents.

This device is an attempt to limit work with decreased expense and spared time. It can be used by small land owners and middle-class farmers who couldn't afford the advanced machinery which lowered the yield and quality. Traditional farming techniques were very time consuming as farmers and labours invested maximum time for the same.

The vehicle will be mount with sensors which will check the moisture content and display it on the LCD, the purpose of checking the moisture content is to build soil ripeness so as to develop better quality product. The soil will then be ploughed which is very essential stage because ploughing rotates the soil which loosens the soil resulting in increased fertility of soil. Thus, ploughing helps increase the richness of soil. The unwanted grass

growing near the crop usually utilizes the soil nutrients which are essential for plant growth thus, removing them is best for crop health which explains the application of grass cutting added to the vehicle. Organic manure (Jeevamrut) is a fertilizer made out of plant and animal waste which is very useful for plant growth. Research has proved the importance of it with drastically increased yield and sufficiently higher quality product. Thus, a tank of organic manure is added which will add it to the soil using tubes. The well grown crops are sometimes badly affected by pests thus another similar tank is added which contains pesticides or herbicides which will sprinkle them on the crops. This way few applications can be covered.
The basic necessities have been tried to be covered in this device which include examining moisture and pH using sensors, ploughing the field, removing unwanted grass by cutting, applying organic manure for enriching soil quality and rescuing the crop by spraying pesticides.

II. PROBLEM STATEMENT

To design a cost-effective agricultural vehicle which can perform multiple applications in a single machine.

III. METHODOLOGY

The vehicle can move between two rows of crops. There will be a sensor which would sense moisture and display it on the LCD. There will be cutters for cutting unwanted grass and ploughing the field. There will be container for organic manure (jeevamrut) and herbicides. This will be Sprayed to the roots of the crop by using a pipe. There will be sprinklers for spraying pesticides on the crops.

IV. WORKING PRINCIPLE

In India farming is the main occupation. Still in India famers follow traditional farming techniques as machineries and other equipment's are unaffordable for many others. Poor and middle-class farmers can rarely invest in efficiency equipment and machineries. For this Purpose, we have constructed this agricultural vehicle which can fulfils the essential need of cultivating and the expense of this agricultural vehicle is less compared to other farming devices. The main objective of agricultural vehicle is fertilizer spraying, applying herbicides and organic manure, seeding, measuring moisture of soil and display it on LCD, ploughing and grass cutting.

i. When the engine starts, the plough is used to plough the field, which can be controlled using different gears and accelerator. Ploughing tool can be easily assembled and dissembled, this operation can be done manually.

ii. When the crop is grown, fertilizers and Herbicides along with Organic manure can be sprayed by using this vehicle.

iii. To measure the moisture of the soil, a soil moisture sensor is interfaced with the vehicle and the readings are displayed on LCD.

iv. To remove excessive grass on the field, a grass cutter is used to remove the unwanted grass.

V. SYSTEM SPECIFICATION

1. Engine:
An Engine is mounted on front side of the vehicle which is 100cc. An accelerator is given near to the handle which can control the speed of engine.
2. Seed Sowing:
The seeds would be stored in a tank mounted on the equipment which is an easily detachable one. For one rotation of wheels of vehicle only one seed will be discharged to the soil by programming.
3. Ploughing:
Ploughing is basically necessary for initial cultivation to loosen the soil as a preparation for sowing seeds. Due to which fresh nutrients are added and previous plant waste is buried. Thus, a detachable plough is added to the equipment for performing ploughing application.
4. Pesticide Spraying:
A container containing Pesticides will be placed on the vehicle. The Pesticides will be sprayed on the crops without harming the person driving the vehicle.
5. Applying Herbicides and Organic manure (Jeevamrut):
A pipe will be located near the wheels of the vehicle and the organic manure will be applied to the roots of the plant. Similarly, herbicides will be sprayed to the crops without damaging the crop. A container will be used to store both the herbicides and Organic Manure.

VI. FEATURES OF VEHICLE

1. Multipurpose agricultural vehicle can perform activities such as sowing, fertilizing, spraying pesticides, grass cutting, ploughing, measuring moisture content in soil.
2. The implementation of this equipment will lead to better quality as well as higher yield of crop.
3. Multitasking, in one assembly it performs ploughing and sowing. In another, it performs application of organic manure along with herbicide and pesticide application.
4. Sequential spacing between seeds and crop rows due to the vehicle width which promotes rise in quality and quantity of yield.
5. Due to grass cutting application, labour task is reduced excessively, which thus reduces labour charges.
6. The assembly and disassembly of this equipment is completely flexible.

VII. FUTURE SCOPE

1. The soil moisture sensor can be interfaced with the cloud and if the moisture is low then, the cloud can send message directly to the person accessing the cloud and automatic water can be supplied similar to Smart Irrigation.
2. This vehicle can be made an E-vehicle by using a battery and DC motors. This will result in reduction of pollution and less petrol consumption as well.

VIII. CONCLUSION

The main aim of this equipment is the cost. In case of smaller farms there is simplicity in working with the help of this equipment. This equipment reduces the cost of ploughing, seeding, grass cutting, spraying pesticides and feeding manure. Such an equipment helps in rise of production and the profits made by farmers. Thus, minimized expenses and maximized production leads to heavy profits.

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