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Smart Coconut Fertilizer Feeding Machine by Receiving and Sending the Signal from Joystick

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ABSTRACT: In south India, coconut farming is consider as one of the major agricultural part. The yield depends on the fertilizer given to the tree consistantly. The fertilizer should be given in equal intervals till life time. Nowadays the process of fertilizer feeding for coconut tree is done manually by the farmers it leads to labour cost, high human resources and also take more time for feeding the fertilizer to the coconut tree. This project gives the whole process like digging, pouring of fertilizer as well as reclosing takes place automatically in a sequential manner and fertilizers are provided to the plants in an efficient way. The prototype model consists of PIR sensor for analyzing the object present infront of fertilizer machine. There is a joystick helps the prototype model to move towards the coconut tree by sending and receiving signal. The digging and pouring part is controlled by micro controller along with wiper motor, after pouring process reclosing part takes place automatically. By this way, it reduces the work of farmers and help the farmers financially in investing and earn more.

KEYWORDS: Fertilizer feeding, less cost, less manpower, digging, pouring, reclosing.

I.INTRODUCTION

India is an agriculture based country. Nearly about 70% of people in our country are farmers. Our economy also depends on agricultural products. To meet the future food demands, the farmers have to implement the new techniques which will not affect the soil texture but will increase the overall production. Agriculture in India has a significant history. Today, India ranks second worldwide in farm output. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. Nowadays due to advanced technologies tremendous changes have occurred in conventional methods of agriculture like seed plantation and irrigation system are used.In the coconut farm, the process of fertilizer feeding for coconut tree is an important factor. But it is done manually, which needs high human resources and also requires more time for feeding the fertilizer it is shown in the Fig 1. Now a days fertilizer feeding rate is more. The fertilizer cost and wages for labour is also increased. And there is also lack of farmers. In order to overcome these problems the prototype model was designed. The model includes the whole process like digging, pouring of fertilizer as well as reclosing takes place automatically in a sequential manner. In this technique the prototype model moves around the coconut tree by receiving the signal, the following instruction is given manually in the joystick. After the instruction is given the prototype model undergoes process such as digging, pouring the fertilizer and then finally it completes the process by reclosing it.

II.EXISTING SYSTEM

In the recent days it has been found that farmers are unable to gain more crop production by use of conventional agricultural methods. The first process is digging which can be done with the help of agricultural equipment i.e, ploughshare. Next process is fertilizer pouring , the person manually carries a fertilizer bag and pour it into the

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coconut tree after the digging process .The duration of feed is shown in the table 1.1. Finally the reclosing part is done by another agricultural equipment garden hoe. Traditional method procedure is as follows:

Fig.1 Existing system

A.TRADITIONAL METHOD PROCEDURE

Amount of salt: 2 kgs per tree/year for 3 years.

- Making a circular canal / trench with a radius of 1 meter from trunk base of 3 inches deep.
- Sufficient amount of fertilizer should be present at the time of manuring is shown in the table 1.1.
- Spread the fertilizer evenly in the circular canal / trench.
- After spreading of fertilizer reclose the soil.

Fertilizer (g) / year	**Urea**	**Phosphate**	**Muraite of potash**	**Dolomite**
6 months	190	420	190	500
1 year	235	530	235	500
1 1/2 year	275	610	275	500
2 year	305	690	305	500
2 1/2 year	385	770	385	500
3 year	375	850	375	500
3 1/2year	420	950	420	500

Table 1.1 Duration of Feed to Coconut Tree

III.OBJECTIVE OF PROPOSED SYSTEM

The process of fertilizer feeding for coconut tree in the farm is an important factor. It is done manually by the farmers which is costlier due to labour cost. In order to overcome it, we proposed a fertilizer feeder machine for coconut farm. The prototype model has a PIR sensor for analyzing the object present infront of fertilizer machine. The machine consists of digging part, fertilizer pouring part and reclosing part. There is a joystick helps the prototype model to move towards the coconut tree by sending and receiving signal. The digging part dig the soil and pouring part pour the fertilizer which is controlled by wiper motor, after pouring process reclosing part takes place automatically. By this way, it reduces the work of farmers and help the farmers financially in investing and earn more.

IV.FEATURES OF PROPOSED SYSTEM

- Uneven spreading of fertilizer becomes harmful for crops. So for getting better crops results even spreading of fertilizer is necessary. Our prime concern is to spread the fertilizers in the farm in definite proportion so it can result in better crop yield.

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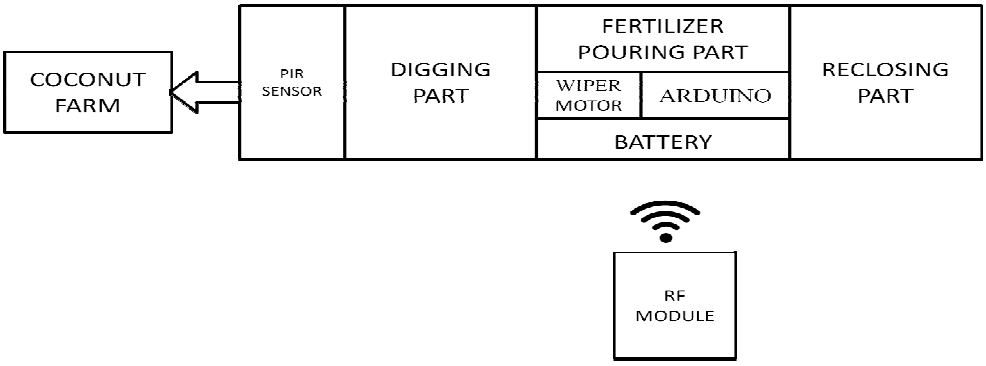
- In the conventional method of spreading the fertilizer in the farm is done by means of hands (manually) which takes too much time to complete the spreading in the whole farm. So major focus is on how to reduce the time of spreading.
- The prototype model decreases the total work done by the farmers for spreading fertilizers, because the farmers have not to carry the heavy bag of fertilizer throughout the spreading process. Apart from these, the fertilizer feeder machine reduce the time consuming for fertilization.

V.BLOCK DIAGRAM



A.PIR SENSOR

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. PIR sensor is used to analyze the object infront of prototype model. If there is any object, the prototype moves away from the object.

S.NO	SPECIFICATION	RANGE
1.	Type	PIR
2.	Voltage	5-12V
3.	Power Consumption	Approx 57.5mW
4.	Current	Approx 11.5mA
5.	Range	5-12meter

Table 1.2 PIR Sensor Specfication

B.BATTERY

Batteries are a collection of one or more cells whose chemical reactions create a flow of electrons in a circuit. All batteries are made up of three basic components namely an anode ,cathode and some kind of electrolyte.

S.NO	SPECIFICATION	RANGE
1	Type	Lead acid
2	Voltage	12V
3	Current	7Ah

Table 1.3 Battery Specification

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C.JOYSTICK

Joystick is used for directional movements. Directional movements are simply two potentiometers - one for each axis. Joystick helps the prototype model to move towards the coconut tree by sending and receiving signal.

S.NO	SPECIFICATIONS	RANGE
1.	Operating voltage	5V
2.	Internal potentiometer	10k
3.	Pin interface leads	2.54mm
4.	Dimensions	4.0cm x 2.6 cm x 3.2 cm

Table 1.4 Joystick Specification

VI. HARDWARE IMPLEMENTATION

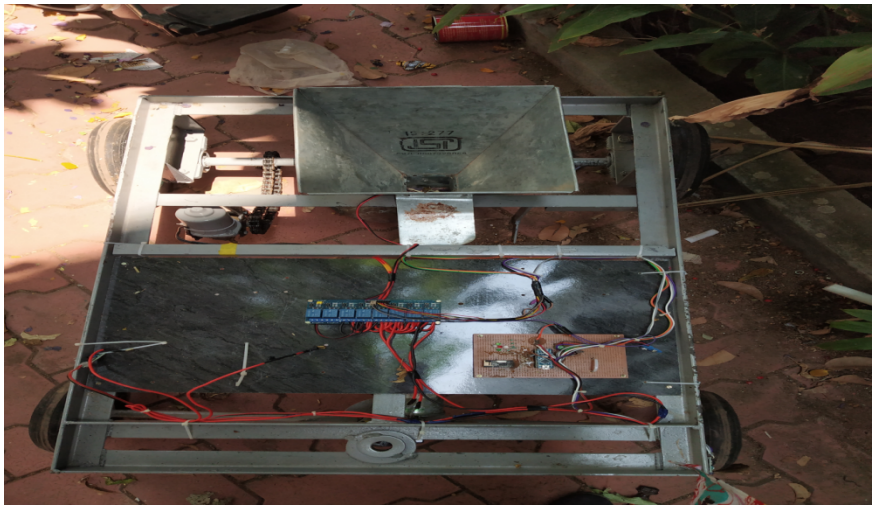

Fig.2 Hardware Implementation

The digging part is used to dig the sand around the tree. Here digging part is designed to dig the soil at the depth of 1.5 inch. Hopper along with actuator controlled opening is fixed at the top of the system is used to pour the fertilizer whenever the system starts to dig. The pouring part starts pouring after the motor stars running. If the motor starts running, the fertilizer starts pouring in the hopper. If the motor stops running, the fertilizer pouring part stops pouring it by the feedback taken in the wiper motor. The mechanical setup fixed at the back of the system used to reclose the soil after the fertilizer is poured.

VII. CONCLUSION

The prototype model pour fertilizer effectively in the field. Joystick gives the signal to prototype model to moves towards the coconut tree based on the direction given. The digging, pouring and reclosing process is effectively done.The proposed system results in, increase in uniformity of fertilizer spreading, reduction in labour cost, less man power and consumes less time. So the yield is also increased by 50%. This fertilizer machine is economical compared to other type of machines and also move towards eco-friendly environment.

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