

Abstract

A Remote Controlled Multi Crop Seed Planting Machine

In agriculture and agro related technologies India is a prominent contributor to such evolutions. Plough based conventional production is associated with multiple challenges that include shortage of water, labour and escalating cost of production. In many parts of Asia water, labour scarcity and timeliness of farming operation are becoming the major concerns for farming community of 21st century. Since this problem can be overcome by emerging technologies and sophisticated equipment like harvesting machine, multi crop seed planter, sugarcane planter, etc. But in most Asian countries, where population and economic growth are outburst, scarcity of agricultural labour, income gap between cities and villages are becoming major issues.

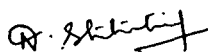
In Asia multi crop seed planting machine are available for different seed planting application. This machine will be mostly suitable for large land areas. In order to utilize this machine here dependability of tractor is a must. So nucleus farm families cannot afford to buy this machine. And also not applicable for fragmented and small land hold farmers.

Here this invention aims to reduce tractor related expenses and make a planting machine suitable for small land areas. This system consist of two motors for motion of vehicle, which is connected to the front wheels. A conical tray is fixed over the chassis containing the seed, fertilizer or manure. Inside the seed tray screw conveyor is placed and it is run with help of motor. The purpose of screw conveyor is to mix the seed and fertilizer and feed to the hose. Seeds are directed to furrows through hoses. Furrows will have a narrow path to plant the seeds to the soil. The same furrows can also be used as a plough tool. This vehicle is operated by remote controller with the help of radio frequency sensor and the supplies for the corresponding motors are functioned through a battery.

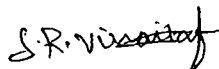
Hence this invention will be useful for small land hold farmers and also this machine is suitable for different applications like planting of a variety of seeds, gardening, apartments, schools, etc. this helps to optimize labour work and cost related issues for farmers. Hence this system is a battery operated, it is ecofriendly to environment.



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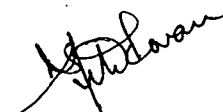
1. A Remote controlled multi crop seed planting machine which comprises of;
 - a. Seed tray
 - b. Screw conveyor
 - c. Motors
 - d. Tynes
 - e. Furrows opener
 - f. Seed rate adjustment strip
 - g. Seed pipeline and Hoses
 - h. Radio Frequency sensor
 - i. Remote controller
 - j. Battery
2. The apparatus of claim 1, wherein the system is provided with all features for performing multi crop seed planting operation and manure spreading operation and also for ploughing operation.

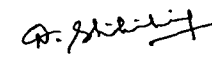
3. The apparatus of claim 2, wherein the system has a structural frame of chassis (1), where four wheels (11) are connected to it. In this front two wheels are driven by a motor (12, 13) and it is powered by battery (15) and controlled using Remote controller (16) it helps to move the vehicle for performing operation.
4. The apparatus of claim 1, wherein the chassis (1) carries all other components and assembled to it.
5. The apparatus of claim 4, wherein the seed tray (2) is mounted over the chassis (1) for carrying seeds and fertilizer or manure.
6. The apparatus of claim 5, wherein the screw conveyor (3) is placed inside the seed tray (2) and it is driven by motor (4). It helps to the mix the seed sand fertilizers.
7. The apparatus of claim 6, wherein the seed pipeline (5) are placed under the seed tray (2) and seeds are delivered through hoses (6) to the boot of the furrows opener (10).
8. The apparatus of claim 7, wherein the tynes (8) having furrow openers at their lower portion and it is clamped to the chassis (1) using U- clamps (9). The distance between the two tynes can be adjusted using U- clamps.
9. The apparatus of claim 7, wherein the vehicle moves and accordingly furrows opener (10) tills. In this furrows opener (10) has a sharp edges in the front side and it is attached to the lower portion of the tynes, which are used to drill the seeds and fertilizer into the soil. In this, the same furrow openers can also be used to perform ploughing operation.

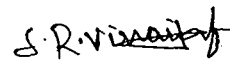
10. The apparatus of claim 7, wherein the seed rate adjustment strip (7) is placed under seed tray (2) and above the seed pipeline (5). This seed rate adjustment strip has a set of holes, which slides over it and can be adjusted based on seed size. Thereby seed flow rate can be adjusted and maintained.
11. The apparatus of claim 3, wherein the vehicle movement and direction is controlled by remote controller (16) with the help of Radio frequency sensor (14).
12. The apparatus of claim 11, wherein the Radio frequency (RF) sensor (14) has RF transmitter and RF receiver. In this, the RF transmitter has remote controlled unit (10) and it transmits signals to the RF receiver, where motors (4, 12, and 13) are interfaced to the RF sensor and it is powered by battery (15). By receiving signals from the RF transmitter, vehicle movement and screw conveyor rotation are controlled.
13. The apparatus of claim 1, wherein substantially described with reference to and as illustration through accompanying drawing. These drawing are for illustration purpose only not intended to limit the scope of the invention.

JUNE
Dated this 26th day of JULY 2015

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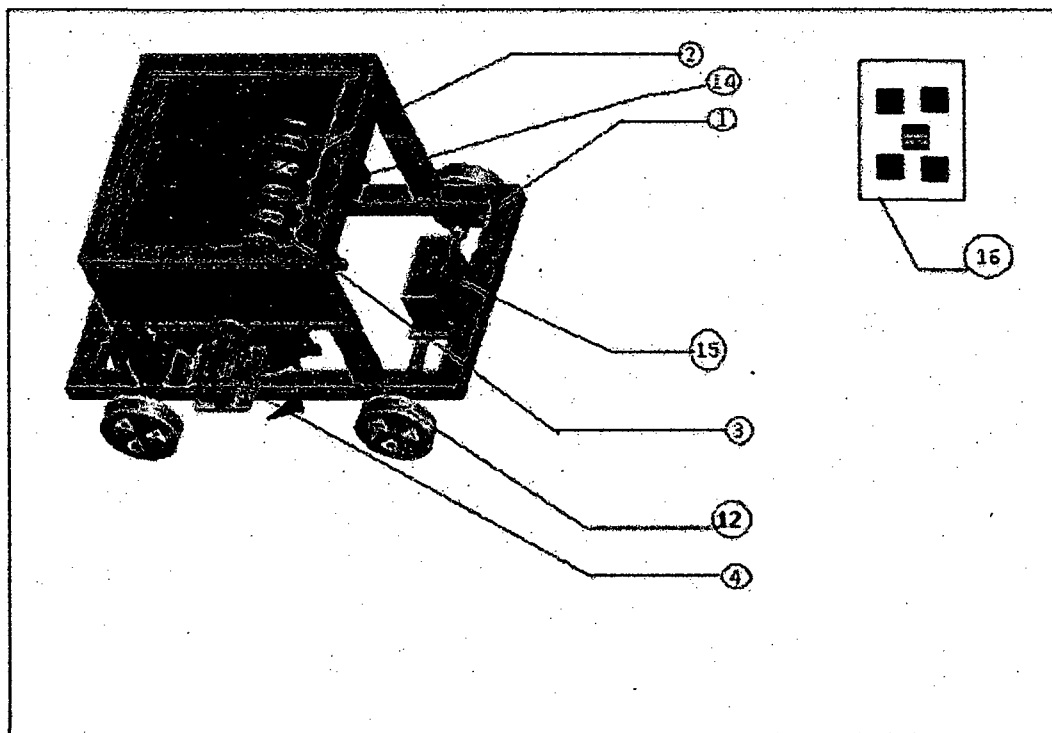
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Sheet No. 1



PART NUMBER	PART NAME
1	CHASSIS
2	SEED TRAY
3	SEED CONVEYOR
4	MOTOR 1 FOR THE SCREW CONVEYOR
12	WHEEL
14	RADIO FREQUENCY SENSOR
15	BATTERY
16	REMOTE CONTROL

Fig 1: Detailed drawing of the Remote controlled Multi Crop Seed Planting machine

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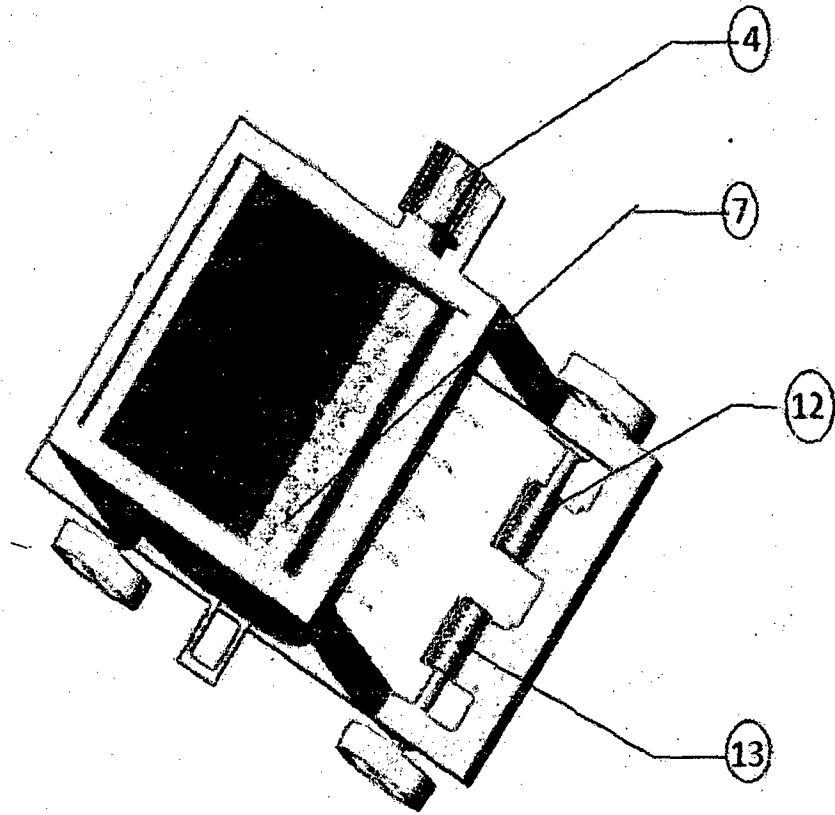
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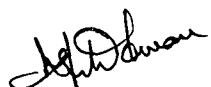
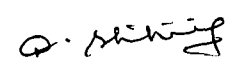
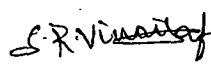
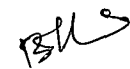
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Sheet No. 2



4	MOTOR 1 (SCREW CONVEYOR)
7	SEED RATE ADJUSTMENT STRIP
12	MOTOR 2-FRONT WHEEL
13	MOTOR 3-FRONT WHEEL

Fig 2: Detailed drawing of the machine – TOP View


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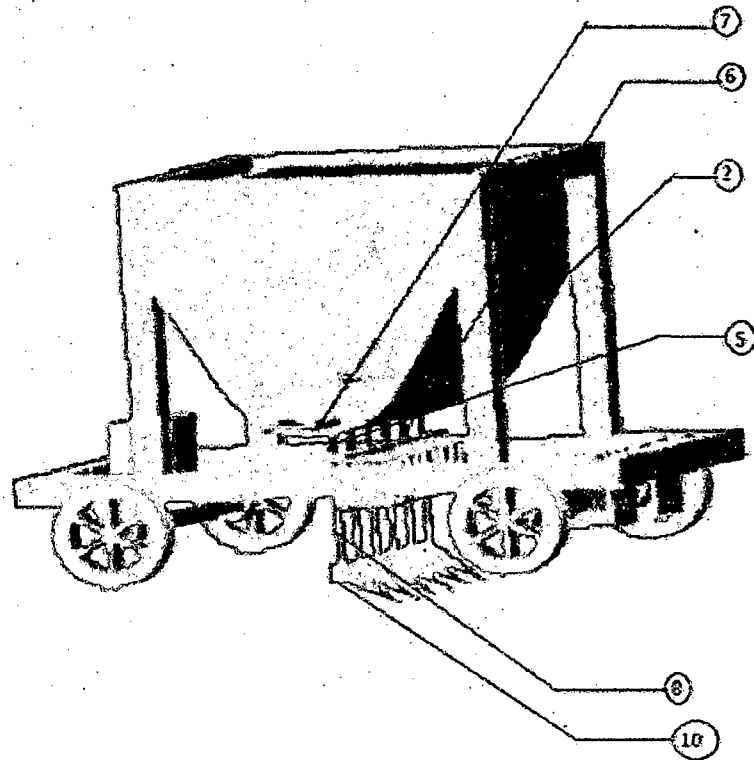
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2	SEEDTRAY
5	SEED PIPELINE
6	HOSES
7	SEED RATE ADJUSTMENT STRIP
8	TYNES
10	FURROW OPENER

Fig 3: Detailed drawing of the machine- Side View

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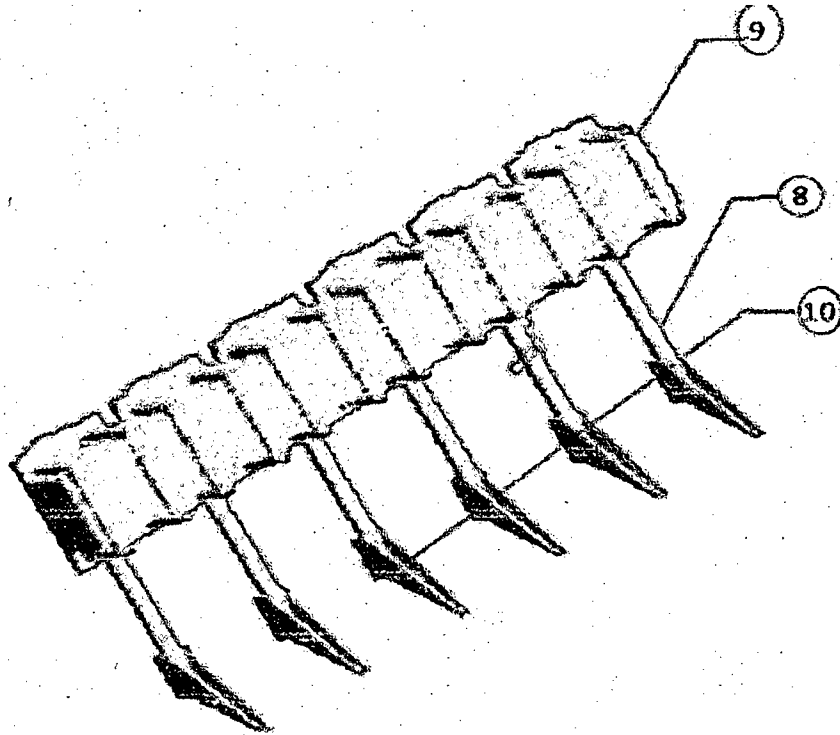
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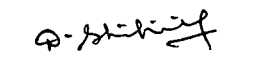
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8	TYNES
9	U CLAMP
10	FURROWS OPENER

Fig 4: Detailed drawing of the Furrows opener - Tool setup


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Field of Invention

This invention is about the remote controlled multi crop seed planting machine. This can also be used for ploughing and manure spreading operation in the field. Since the system is remote controlled and battery operated. It is ecofriendly to the environment. This system aims to reduce the man power and helps to improve efficiency of all the above operations than that of manual methods.

Technical Background

Traditional method of seed planting and ploughing is a time consuming and labour intensive operation. In the present day's multi crop seed planter are available in the market for planting several crops such as mustard, barley, maize, wheat, etc. This planter also have a provision for planting both seed and fertilizer simultaneously. But this planter usually attached to a tractor through hinge joints with help of link pins, can be used for large areas. The dependability of tractor increases equipment cost, maintenance cost. For small hold land farmers it is difficult to buy or rent tractor every time while transplanting the seeds and for ploughing operation. So they mostly depend on manual methods for seed planting operation.

So our invention relates to reduce the tractor related expense and replace it with a remote controlled manure spreader and seed planter. Thus this work is an attempt to optimize the labour work and reduce cost related issues of nucleus farming families and farmers with fragmented land holdings. By this

farmers can effectively utilize this machine for ploughing and seed planting operation.

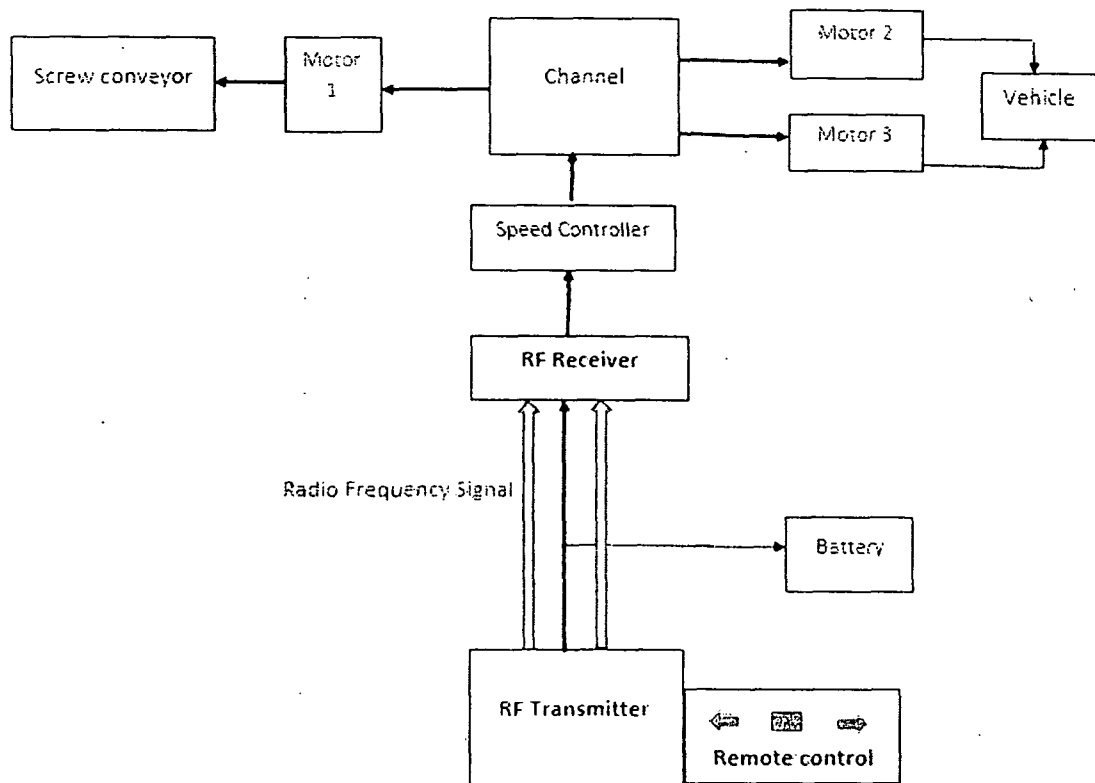
Summary of Invention

The main focus of this invention is to reduce tractor related expenses and easy to operate in small land areas for farmers. This system consist of two motors for motion of vehicle where these two motors are connected to front wheel. In the chassis seed tray is fixed. Seed tray carries seeds, fertilizer or manure. Inside the seed tray, screw conveyor is placed. It is rotated by the motor. Which is used to mix the seed, fertilizer and to move the seeds at a constant rate. Seed rate adjusting strip is placed under seed tray to control the seed flow rate, which are directed to furrows through hoses. These furrow openers are attached to the lower part of the tynes, used to till the soil. As the furrow tills, seeds and fertilizers are directed to furrow openers through hoses. The same furrows can be used as a plough tool. Tynes are attached to the chassis using U clamps. This can be adjusted for seed to seed planting distance. As the whole system is directed by Radio frequency sensor, motors are interfaced with Radio frequency sensor for controlling the vehicle movement and the corresponding supplies are powered by battery.

Block Diagram Depicting the Indicator Diagram

The below block diagram illustrates the working mechanism of system. In this system radio frequency sensor is used to control and operate the vehicle because it can travel longer distance and so it is suitable for long range application. Radio frequency module comprises of Radio frequency

transmitter and Radio frequency receiver. Radio frequency receiver part receives signal from the radio frequency transmitter and it sends to speed controller for controlling the motor speed and it is directed through channel. In that channel all the three motors are interfaced for their operation.



In this motor 1 is used to run the screw conveyor for mixing seeds and fertilizer and feeding seeds to the hoses. Then motor 2 and motor 3 are used to run the vehicle. In this Radio frequency has a remote controller part, it is used to operate and control the vehicle speed and to move vehicle in forward and reverse direction. Then the whole system is operated and functioned through battery. Hence this system is a battery operated device, it does not emit smoke and ecofriendly to the environment.

Brief Description of Drawing

Description about the Assembly

This system consist of chassis (1) which supports all the components that are assembled to it. A seed tray (2) is assembled to the center of chassis (1) which is used to contain seeds, fertilizers. Inside the seed tray (2), screw conveyer (3) is fitted throughout its length. This screw conveyer (3) uses a rotating helical screw blade for mixing seed and fertilizer. This screw conveyer (3) is rotated with help of motor (4) and it is functioned through battery (15). At the base of seed tray (2), there is a provision for seed pipeline (5) to get the seeds out of the (2). Seed pipe line (5) has constant size of holes at the base of tray (2), over that seed rate adjusting strip (7) is used to control the seed flow rate based on seed size. From seed pipe line (5), seeds are directed to furrow opener (10) through hoses (6). Hoses (6) are connected between each seed pipe line (5) and furrow opener (10). And the tynes (8) are assembled to the chassis (1) using U-clamps (9). Furrow opener (10) are attached to the lower portion of the tynes (8) which are used to drill the soil. This system consists of four wheels (11) are connected to the chassis (1). The front two wheels are driven with help of two motors (12, 13). And the supplies for the motors (12, 13) are powered through battery (15). The whole system is controlled by remote controller (16) using Radio frequency sensor (14). Radio frequency sensor (14) is attached to the vehicle. All the three motors (4, 12, and 13) are interfaced with radio frequency sensor (14) where supplies are taken from battery (15) and it is controlled and operated with help of remote controller (16).

DETAILED DESCRIPTION OF THE DISCLOSED EMBODIMENT

This system enables multi crop seed planting operation and manure spreading operation in the field. This can also be used for ploughing operation in the field. It has a structural frame of chassis (1), which supports all other components. In this wheels (11) are connected to the chassis (1), where the front two wheels are driven by motors (12, 13). By this vehicle can be to move in forward and reverse direction, by using the remote controller (16). It has a seed tray (2) connected to the chassis, this is used to contain seeds, fertilizer or manures in it. Inside the seed tray (2), screw conveyor (3) is placed which is driven by motor (4). This screw conveyor helps to mix the seeds and fertilizers inside the tray (2) and also to deliver the seeds at constant rate under the seed tray (2), there are seed pipelines (5) at certain distance to get the seeds out from the tray. Then the seeds are directed by hoses (6) through furrow openers (10). This furrow openers (10) are carried by tynes (8) and is connected to the chassis (1). All tynes (8) are clamped using U- clamps (9). The horizontal distance between the seeds which are to be planted can be adjusted using U- clamps (9). The rate of seed output from seed tray (2) can be controlled based on seed size and accordingly adjust the seed rate adjusting strip (7). So there will be a constant seed flow rate. Hence by moving the vehicle, furrows (10) will create a pathway in the field. At the same time seeds and fertilizers are directed by hoses through boot of the furrow openers (10) and helps to fall in to the soil. So by continuous movement of vehicle, furrow opener (10) moves the fertilizer and seeds and then they are drilled into the soil. In this all the three

motors (4, 12, and 13) are powered through battery (15) and battery is rechargeable. It has Radio Frequency (RF) sensor (14), which consist of RF transmitter and RF receiver. The RF transmitter has remote controller (16) which transmits signal to the RF receiver, which is attached to the vehicle. In this all three motors (4, 12, and 13) are interfaced with the channels of RF sensor (14) and signals for vehicle movements are transmitted using remote controller (16).

Benefits of proposed system

- Effective utilization in small land areas
- Multi crop seeds can be planted using this machine
- Reduce human fatigue and easy to operate.
- Seed planting, manure spreading and ploughing operation can be achieved in a single machine.
- It does not emit smoke and is ecofriendly in nature.
- Reduction of man power to spread the manure in the field.
- Less time taken for spreading manure compared to manual method

Benefits of proposed to the existing system

In existing seed planting machine is available only to plant seeds in medium and large land areas. And it always depends on tractor for planting operation. In order to overcome this difficulties our inventions aims to do seed planting operation with the help of remote controlled and battery operated vehicle. This farm equipment can be considered as one of the best suited devices for the field of agriculture as it does not emit smoke which has a dangerous effect on the land and the crops and also a variety of seeds are planted in the soil using this machine. This system will be useful for small land hold areas to plant seeds at a low cost equipment. This same equipment can be used for spreading manure and for ploughing operation. This system will also be applicable for gardening and house farming areas.

PART NO.	PART NAME	PART NO.	PART NAME
1	Chassis	9	U-Clamp
2	Seed tray	10	Furrows Opener
3	Screw conveyor	11	Motor2- front wheel (LH)
4	Motor1- Screw Conveyor	12	Motor3- front wheel (RH)
5	Seed pipeline	13	Wheels
6	Hoses	14	Radio Frequency Sensor
7	Seed rate adjustment strip	15	Battery
8	Tynes	16	Remote controller