A Survey on Automated Agribusiness Furrowing Seeding and Grass Cutting Utilizing Android Smartphone

Seema H R[1], Megha K S[2], Meghashree[3], Roja S[4], Shilpa P[5]

[1,2,3,4,5] *Information Science, Assistant Professor, VVIET,Mysuru,Karnataka,India*

([1]seemahraju@gmail.com,[2]meghasuve@gmail.com,[3]meghashree2322@gmail.com,

[4]rojas222@gmail.com,[5]shilpapb130@gmail.com)

ABSTRACT-The paper aims on the design, development & the artifact of the apprentice which can put the seeds, dig the soil, plough the land, acid the decay bulb these accomplished systems of apprentice works with battery. In India abreast about 70% bodies abased on agriculture. So the agronomics arrangement in India should be avant-grade to abate the efforts of farmers. Various operations are performed in the agronomics acreage like seeding, weeding, decay bulb cutting, plowing etc. Actual basal operation is seeding, agronomics and bulb cutting . But the present adjustment of seeding, agronomics & plant cutting are problematic. The equipments acclimated for berry sowing are actual difficult and annoying to handle. So there is a charge to advance accessories which will abate the man power. The apparatus can be avant-grade for sowing seeds in farm with accurate ambit amid berry is adjusted. In this paper apprentice administration

Keywords:Agricultural Apprentice, Agricultural Machinery, Bluetooth, Ultrasonic sensor, Apprentice technology.

I. INTRODUCTION

Food is the man's most basic requirement. Man has become the center part in food production, where this has become the limiting factor. All through the ages men have struggled to produce more and superior food for increasing population. The use of technology advancement is to increase the productivity and the safety of an operator. Automation technology has been used in every domain like construction, manufacturing and etc. But now it has been incorporated in the field of agriculture[9].

The term agriculture is coined from two Latin words ager means field and culturia means cultivation. In agriculture most of the energy consuming work is done by the farmers. For example in the vegetable field, the farmers should lift the heavy bags of vegetables at the time of harvest and during fertilizing time they carry the bags of fertilizers. These operations are repetitive, energy consuming work for farmers[11]. After the manual operators, then comes the tractor-based operator such as the power units that are exposed to high noise and vibration, which is very hazardous to health of the farmers[10].

The development of AgriRobot was started from the past 1980s and these agrirobot are mainly used for seeding, spraying and weeding process. The agrirobot is built by using sensors and some of the enabling technologies like wireless communication and GPS. Kawamura and co- workers developed the apple-harvesting robot for harvesting apples. Many of the robots are still in the stage of research and development. An efficient robot is one which should have a high performance with the low cost price[11].

Over the past, agriculture has advanced from a laboring occupation to a highly technical business, using a wide variety of tools and machines, but now the researchers are looking for robots to do the agricultural activities. The initial stage of evolution, automatic vehicle guidance, has been studied for a great number of years, with a number of revolutions investigated as early as the 1920s.The idea of completely autonomous agricultural vehicles is far from

newly discovered; examples of initial driverless tractor prototypes using leader cable guidance procedure date back to the 1950s and 1960s.In 1980s, the possibility for integrating computers with image sensors contributed opportunities for machine vision based guidance systems. In mid-1980s researcher's at Michigan state university and Texas A&M university were exploring machine vision guidance. Further, throughout that decade, a program for robotic harvesting of oranges was successfully performed at the University of Florida.

In India during the decades of 1970s and 1980s there was a dramatic increase in productivity which is credited to a sequence of steps that led to the accessibility of farm technologies frequently described as green revolution. The vital sources of agricultural extension during this span were the spread of modern crop varieties, intensification of input use and investments leading to expansion in the irrigated area. In regions where green revolution technologies had major influence, growth has now reduced. New methodologies are now essential to push out yield frontiers, utilize inputs more productively and transform to more maintainable and higher value cropping patterns[11].

In 1997, agricultural automation had become a vital subject along with the advocacy of precision agriculture.Many of the Indian researchers also designed many of the AgriRobot some of them are given below:

1. Mahesh R. Pundkar et al studied the performance of seeding, plowing and plant cutting devices by using image processing algorithm using flash magic. They also studied the effect of seed depth, seed spacing, miss seeding ratio and performance seed sowing device on germination of seed and efficiency of yield crop[2].
2. Aditya kawadaskar et al redesigned and tested the seed sowing machine using CAD package like PROE. They concluded that multipurpose seed sowing machine maintain row spacing, control seed and fertilizer rate, control the seed and fertilizer depth[3].
3. Ajith Abraham, He Guo, and Hongbo Liu, .This highly adaptable and self-organized system of robots is a new approach to co-ordination of multi robot systems[4].
4. B.Mursec et al presented two sowing machines pneumatic vacuum sowing machine OLT and pneumatic pressure sowing machine Aeromat-Becker for interval sowing, differing in the mode of operation for cultivation of sugar beet. They concluded that on the pneumatic vacuum sowing machine OLT the optimum distance between seeds in the sowing row is reached with 4.5 - 8 km/h speed and on the pneumatic pressure sowing machine Aeromat - Becker with 4.5 - 10 km/h[5].
5. Joginder Singh studied the effect of farm mechanization on Indian economy He concluded that Production and productivity cannot be enhanced with primitive and traditional methods. Thus, selective mechanization is the need of the future[6].
6. Mahesh K. Ashatankar The machine can be advanced for sowing seeds in farm with particular distance between seed is adjusted. It cans automatically sowing seed in land. It can be also used fertilizer sowing instead of seed. The basic requirements of this machine for small scale cropping, they should be suitable for small farms, simple in design and technology and versatile for use in different farm operations. A automatically operated template row planting will designed and developed to improve planting efficiency and reduce drudgery involved in manual planting method. Seed planting is also possible for different size of seed at variable depth and space between two seed. Also it increased seed planting, seed/fertilizer placement accuracies and it is made of durable and low cost material affordable for the small scale peasant farmers[7].
7. Simon Blackmore Developed agriculture needs to find new ways to improve efficiency. One approach is to utilise available information technologies in the form of more intelligent machines to reduce and target energy inputs in more effective ways than in the past. Precision Farming has shown benefits of this approach but we can now move towards a new generation of equipment. The advent of autonomous system architectures gives us the opportunity to develop a complete new range of agricultural equipment based on small smart machines that can do the right thing, in the right place, at the right time in the right way[8].

The automatic agricultural vehicles is categorized into four categories

1. Guidance: To know how the vehicle navigates.
2. Detection: How the vehicle extracts the features of environmental field.
3. Action: How well the vehicle executes its task. Example radicchio harvesting.
4. Mapping: The construction of the map of agricultural field with its relevant features[9].

The main motivation for developing agricultural automation technology is to reduced labour force, a phenomenon common in the developed world. Other causes are the requirement for upgraded food quality, security in terms of inspection of contaminants in food grains and saving the wastage of resources and to save time from manual work and to improve efficiency of the agricultural products and also increase the productivity, accuracy and enhanced operation safety.

II. METHODOLOGY

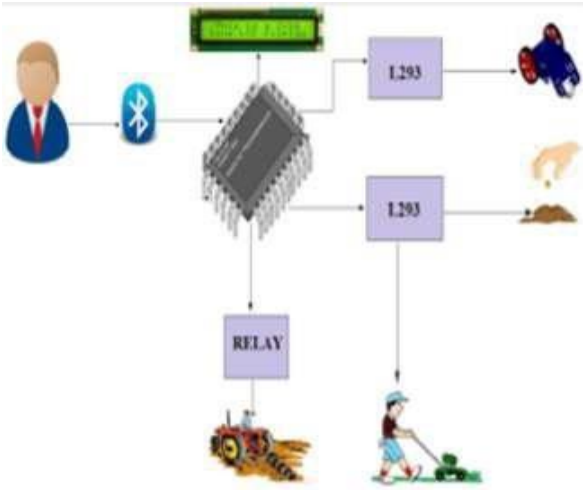

Figure 2.1 Block diagram of agricultural system model

The Block diagram generally contains ultrasonic sensor, Bluetooth module, microcontroller, L293, hand-off, LCD furthermore, Power supply. These modules are fused to complete a lone task. The proposed system is controlled with Renesas 64 stick microcontroller. Here, Bluetooth will send the commitment to the microcontroller. Microcontroller takes simply propelled data. Robot machine can't peruse mechanized info so L293 is a Motor driver circuit that adherents propelled banner to straightforward or mechanical information. Motors are annexed to robot machine that is constrained by driver circuit. To do advancement, motors are required. Driver circuit is used to control speed. In Seeding valve there is opening and closing advancement. At right position it will open and close, will settle a few deferral. Ultrasonic sensors will recognize the plants. Plant cutting is done by motors. Exchange is a trading task and wrinkling is performed[1].

III. FLOW CHART OF SYSTEM

The figure 3.1 below shows the flow of the system. Initially the user activates the Bluetooth and once the connection is set the user selects the operation to be performed, the operations which is performed are ploughing, seeding, weeding, fertilizing and etc. The Bluetooth receives the command and this Bluetooth command is send to the microcontroller where a microcontroller is one which acts as a thimking machine and the inpiut is processed by the microcontroller and the selected operations are performed. The operation will be performed until the stop criteria are met[1].

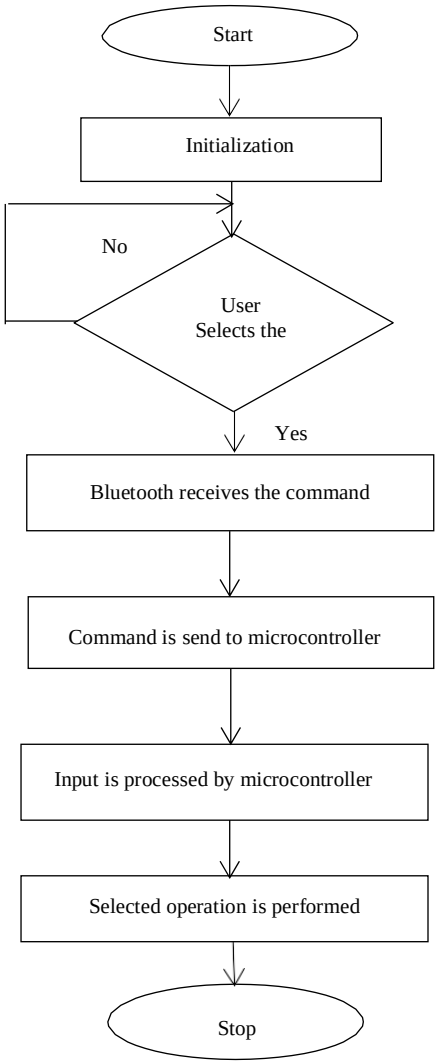

Figure 3.1:Flowchart of System

IV. APPLICATIONS OF AGRIROBOT

The Robots are classified into some set of group each group of robot perform some stipulated tasks like harvesting, picking, weeding, pestcontrol and maintenance. The number of agri robots are increasing year by year. The researchers are inventing the robots for milking cows, shearing sheep, picking fruits, weeding, spraying and cultivation and etc. They uses GPS module and sensors for navigation and day by day the robots size are becoming smaller and smarter.

The important applications of robotics are as follows:

1. **Fungicides :** Robots are used to prevent and cure the plant disease. Fungi are one of the disease which harms the plant leaves which is the main location for photosynthesis which leads to reduction in the production rate and it also harms the fruit, vegetables. So the robots are used to spray the fungicides, a king of pesticide[11].
2. **Herbicide:** Robots are used to remove the weeds which grow around the plants and these weed plants

are collected and brought to a compositary site where it can be decomposed. The decomposed material is used as natural manure. Instead of using the manure if a labour uses herbicides, a chemicals that can destroy a plants growth[11].

3. **Pesticide:** Pesticides are used to harm or remove the pest where this method has an disadvantage where the pest adopts for the toxin and this adaption will be transferred to the offspring's and these offspring's become resistant to the pests.To avoid this robot have been designed where it uses the vacuum system which sucks the pests and submerge them in the water or extreme heat. The robots are programmed in such a way that it can remove particular pests[11].
4. **Mushroom Picking Robot:** Mushrooms are very hard to grow it requires lot of labor and the cost of labor is also high. The mushrooms grow in the dark and damp area which is hostile for the human beings. So the robots are used where robots has a arm which is used to pick the mushroom. Usually a mushroom takes 6 to 10 weeks to mature so to identify the mature mushroom a camera will be placed in the robot so the camera can identify the matured one and notifies to robot to pick it[11].
5. **Slugbot:** Slugs are the one which eats the leaves of plants and put big holes in fruits like tomatoes to stop this they invented a robot called as slugbot. The slugbot detects the slugs and remove it from the crops[11].
6. **Ecobot II:** Ecobot II is the symbiosis robot where it eats the dead flies and rotten fruits and releases the carbon dioxide which is required for photosynthesis in plant leaves.
   Ecobot I is sugar eating robot[11].
7. **Ag Ants:** Ag Ants is the small and very inexpensive robots which are used for finding weeds, insects, diseases, sampling soil for nutrients, and applications of pesticides and herbicides. One robot identifies weed and send this information to another robot so the other robots can help in removing the weeds, here the robots acts as an army of robots[11].

V. CONCLUSION

The technique of using agricultural robot is advantageous to the farmers for the fundamental seed dispersing performance along with digging the soil, ploughing the land, spraying of pesticides and cutting the waste plants. The method of performance of this machine is extremely simple even to the non-professional person. Low germination percentage resulting in wastage of seeds can be decreased by the use of this technique. Formation of gap due to non-germination of seeds can be avoided. Overall yield ratio can be incremented dramatically, manual problems can be reduce. As differentiated to manual and tractor based sowing time, energy needed for this robot technique is to a lesser degree. Furthermore, wastage of seed is to a smaller extent.So this technique of using agricultural robot in agricultural field for performing various agricultural operations will be a effective option for the farmers who want to execute the primary operation in a professionally structured manner. To make the system appropriate for real time purposes components with greater scope needs to be implemented.

VI. REFERENCES

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