Abstract: Now a days robotics in agriculture mechanical autonomy in farming division with its execution in view of accuracy horticulture idea is the recently developing innovation. The fundamental explanation for mechanization of cultivating forms are sparing the time and vitality required for performing monotonous cultivating assignments and expanding the profitability of yield by treating each harvest exclusively utilizing exactness cultivating idea. Outlining of such robots is demonstrated in light of specific approach and certain contemplations of farming condition in which it will work. These contemplations and distinctive methodologies are talked about in this paper. Likewise, model of a self-sufficient Agriculture Robot is exhibited which is particularly intended for seed sowing undertaking as it were. It is a four wheeled vehicle which is controlled by LPC2148 microcontroller. Its working depends on the accuracy agribusiness which empowers effective seed sowing at ideal profundity and at ideal separations amongst crops and their columns, particular for each harvest compose.

Keywords: Agribot, Precision Agriculture(PA), Precision Farming, LPC2148.

I. INTRODUCTION

In India for the most part the customary seed sowing strategies incorporates the utilization of creature drawn channel and pipes driller or penetrating utilizing tractor. Prior strategy requires work and an extremely time and vitality devouring. Though in tractor based boring administrators of such power units are presented to abnormal state of clamor and vibration, which are inconvenient to wellbeing and work execution. The accentuation in the advancement of self-ruling Field Robots is at present on speed, vitality productivity, sensors for direction, direction exactness and empowering innovations, for example, remote correspondence and GPS. Numerous agribusiness operations are computerized these days and numerous programmed hardware and robots accessible monetarily. A portion of the significant operations in cultivating which are under research and mechanization are seeding, weeding and showering forms. With regards to planning a robot for mechanizing these operations one needs to break down its thought into two contemplations which are farming condition in which robot/framework will work and exactness prerequisite in the errand over customary techniques. In light of this for seeding process, contemplations which are considered regarding condition are: robot must have the capacity to move in straight route legitimately on rough streets of homestead field, soil dampness substance may influence the dirt burrowing capacity, sensors to be chosen for the framework must be picked by thinking about cultivating ecological impacts on their working.

Aside from these three different necessities are as far as precision required in the errand and these are: burrowing profundity, specific ideal separations amongst lines and plants for certain kind of harvest, lines to be sown at once and exact route in the field. While alternate procedures like weeding, showering and collecting, for which working relies upon seeding stage by knowing the correct area of yield and after that making those operations on it in like manner. So the significant phase of every single consequent operation is keeping up an accuracy in seed sowing process. While thinking about the physical parts of the vehicle or automated framework, rancher's current condition specifically region assumes a noteworthy part in planning these perspectives. Thinking about certainties of cultivating industry of India, framework to be produced must have advantage over customary techniques and tractors as far as cost, speed, exactness in operation for which it is planned, fuel utilization and physical vitality required by human for it. By focusing on these issues and contemplations appropriately the final result will be genuine help for agriculturists. A broadly useful self-governing mechanical control framework intended for horticulture field applications has four center capacities: direction, identification, activity and mapping which are considered in the outlining as indicated by application prerequisite.

These capacities are interlinked and grouping of operations to be executed by interlinking these four capacities is given by arrangement of framework engineering in paper [8]. This engineering has the two informational collections Precision Farming Data Set (PFDS) and Precision Agriculture Data Set (PADS) as connections between frameworks. Cushions is persistently refreshed by detecting the required data of yield and soil, in light of this PADS detected information and route information of land in PFDS follow-up operations should be possible for e.g. compost showering.
hardware construct operations with respect to the product will be then in light of the seeding arrangement exactness. Here, proposed framework for seeding is fundamentally in view of two phases direction and activity. Agronomical requirements for the product development are demonstrated by exactness farming term, so agronomical needs in the model created are spatial separations to be kept up between two lines and two harvests.

II. SCOPE

By using this robot in the field of agriculture it can help the farmers in the initial stage of agriculture, i.e., during digging and seed sowing. This robot is a small scale effort but the same can be implemented with enormous results in a large scale that benefits all farmers. Apart from ploughing, seed dispensing, spraying pesticides and fruit picking other farming process like harvesting, irrigation etc. can also be implemented in one robot thus making the machine capable of multi-tasking. Also looking forward to learn about and implement agricultural based agro-bots like Nursery bot, Herder bot, Wine bot, Bee bot, and Hamster bots that would qualify the standards from the current precision to autonomous farming methodologies. This robot can be a better substitute for the human who performs the seeding and fertilizing. This robot is very useful for the farmers who are interested to do agriculture activity but facing the labour problem.

III. METHODOLOGY

The assembly of the robotic system is built using high torque DC motor, communication module, relay driver circuit, Battery package, microcontroller which is shown in block diagram below. When DC motor is started, the vehicle moves along the particular columns of ploughed land for digging and sowing the seeds and its movement is controlled by remote guiding device. The remote control transmitter and receiver is shown in block diagram. This system has two main sections, robot section and control section, which are intercommunicated by using communication technologies as shown in Fig.1. The control section as well as robotic section possesses via ploughing unit, seed dispenser, and seed storage, robotic system with motors, microcontroller, and power supply. The microcontroller is brain of this system, which gives the order of suggestions received to all the networks, and sensible factors processed by their corresponding embedded programs. Robotic mechanism runs by their internal motors and motor drivers that drive the motors in desired directions.

IV. RESULTS

Results of this paper is as shown in bellow Figs.2 and 3.

V. CONCLUSION

An autonomous robot is developed to perform the complex farming task of seeding. Agrobot in this project is designed to perform sowing only for four crops: cotton, maize, soybean, wheat. Row and column distances required for these four crop types are modeled in the system. With slight variations of few centimeters in the distances defined robot successfully covers distances between crops and their rows. Navigation technique using IR sensors in Agrobot is easier and less bulky over other existing agriculture robotic systems. Ease of handling and precision working makes this agriculture robot real aid for farmers. Less complexity in the mechanical design and simpler navigation technique makes the system of lower cost and less bulky compared to conventional tractors. Also the coverage area by the robot is restricted because of its dependence on DC battery. Other
crop types can be included by modeling their required optimal distances. In future, the system can be modified for other farming tasks too such as weeding and spraying processes with some mechanical designing modifications and by using advanced controllers and sensors. More advanced and fast system can be developed with more focus on implementation of right mechanical parts and their designing.

VI. REFERENCES


Author’s Profile:


Mr. Ch.Suresh has received his B. Tech in Electronics Instrumentation and Control Engineering from S.V. University, in 2007 and M.Tech degree in Embedded Systems from Calicut University in 2009 respectively. He is dedicated to teaching field from the last 7 years. He has guided 6 P.G and 32 U.G students. His research areas included Embedded Systems. At present he is working as Associate Professor in Andhra Engineering College, Nellorepalam, Andhra Pradesh, India.