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A Review Paper on Analysis of Fertilization by using Fertirobot

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Abstract: *Agriculture is a vital sector of the Indian economy. This is because it provides jobs for about half of India's workforce and contributes 17% of India's GDP. Since independence, many changes have been observed in this area. After independence, India depended on agricultural imports. Using modern technologies the labourwork , cost will be minimize as well as get sophisticated way of farming. Precision agriculture sensor monitoring network is used greatly to measure agricultural-related information like temperature, humidity, soil PH, soil moisture, soil nutrition levels, water level etc. The main aim is to reduce the human effort and reduce labour cost by using technologies in agriculture. In this paper, Author surveyed some typical applications of Agriculture IOT so that we use IOT technology to operate the fertirobot easily as well as at different depth of soil provide fertilizer at different depth easily. IoT agriculture model is addressed wireless networks. Ultimately in this way farmers goals also achieved successfully. This iot technology is very helpful for farmers ultimately.*
Keywords*: Agriculture , IOT , Fertilizer , IOT Technology.*

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I. INTRODUCTION

India is one of an agriculture driven country in farming practices throughout the world, including India, has revolutionized food production, enabling it to maintain pace with the population growth. Current agriculture system is very time consuming and also not so accurate with respect to cost and farmer. The concept of this Solid Fertilizer DispensingMachine is actually based on the current phenomenal in plantation system. Easily operatedand repair by farmers. The main intention of this project is to reduce the cost of machine and get optimum yield.

Precision Farming has authorized depletion of the area of management from the whole farm field down to sub field level. For six decades' robots have played a fundamental role in increasing the efficiency and reducing the labor work with high accuracy of work completion. In past twenty years, a similar trend has started to take place in agriculture, with GPS and vision-based self-guided tractors and harvesters already being available commercially. There are electrical sensors used in these machines to achieve the required target of accuracy and precision. So seeding process through modern machines could not practically favourablethe farmers. In the present paper, we present solutions to the above mentioned problems by designing the automated robot that has a potential to fertilize the various crop, track the lanes and follow the path automatically in future.

In this study we investigated the effects of N fertilization on various crop growth and yield, and on arthropod populations and the activity of arthropod natural enemies in various crop. N fertilization will corresponds positively with various plant growth. Increased N fertilization will increase pest citizens because plants with more N will be more nutritious for and delectable to herbivores. Out of them solid fertilization is one of the major key and day-to-day job of the farmers. With the help of automation the work becomes easy and faultless. Robots small sized wheels performs well, the lightweight of the robots do not dense the soil.

The idea of appealing robotics technology in agriculture is very new. In agriculture, the food times for robot-increase productivity are immense – and the robots are appearing on farms in various guises and in increasing numbers. We can look for the robots performing agricultural operations automatically. Due to absense of technical knowledge most of the processes are still conventional. Even though mechanization is introduced into agriculture, its use is quite low. The main factor responsible for this problem is that the high cost of farm machineries. Most of the farmers have small share of land in their possession and cannot afford to own these machineries also the hourly rent for these machines is not feasible. Thus require of low cost agriculture machines appear. The machine should be value for money. The following machine should have multiple uses in agriculture. It should be handy and easy to operate.

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In the paper, "Image processing based real-time variable-rate chemical spraying system for disease control in paddy crop" the authors V.K.Tewaria, C.M.Pareeka, GurdeepLala, L.K.Dhruwa and NaseebSinghb used Chemical with conventional sprayers results in wastage of applied chemicals, which increases the economic losses as well as pollutes the environment. In order to overcome these disadvantage, an image processing based real-time variable-rate chemical spraying system was developed for the precise severity information. The developed system comprised of web cameras for image Processing, laptop for image processing, microcontroller for controlling the system functioning, and solenoid valve assisted spraying nozzles. The Image segmentation method based on chromatic aberration (CA) was used to detect the diseased region of paddy plants. The disease severity level of paddy plants were calculated by the system, based on which the solenoid valves remained on for a specific time duration so that the required amount of agrochemical could be sprayed on the diseased paddy plants. Hence, the developed system seems promising and could be used extensively to reduce the cost of pest management as well as to control environmental pollution due to such agrochemicals. [1]

In the paper, " Farmers' perspectives on field crop robots – Evidence from Bavaria, Germany" the authors O.SpykmanabA.GabrielaM.PtacekbM.Gandorfera used Farmers' behaviour toward field crop robots in a European setting have hardly been studied despite an increasing availability of the technology. Given the relevance of robots for small-scale agriculture, however, their acceptability in regions dominated by small-scale agriculture such as Bavaria, Germany, is of individual interest. Using questionnaires at two events included lectures and field demonstrations data were gathered and then using bivariate tests it is analyzed. Generally, larger farms respondents focused more on financial benefits from robots and prefer large autonomous tractors. On the other hand, organic farmers or small-scale consider environmental benefits of field crop robots relatively more important and favor small robots. Organic farming also positively correlates with the intent to purchase field crop robots within the next five years.[2]

In the paper, " Design of a Mechanism with Embedded Suspension to Reconfigure the Agri_q Locomotion Layout" the authors Carmen Visconte, ParideCavallone , Luca Carbonari, Andrea Botta and Giuseppe Quaglia used The Agri_q is an electric unmanned ground vehicle specifically designed for precision agriculture applications. Since it is expected to transit on structureless terrain, especially uneven terrain, or to climb obstacles or slopes, an eight-wheeled locomotion layout, with each pair of wheels supported by a bogie, has been chosen. The wide contact surface between the vehicle and the ground ensures a convenient weight distribution; moreover, the bogie acts like a filter with respect to ground irregularities, reducing the transmissibility of the oscillations. Hence, reducing the number of ground contact points to compare the torque adsorption in different configurations, namely four, six, or eight wheels, could be of interest. The kinematic synthesis of the mechanism and the dynamic characteristics of the Agri_q suspended front module were presented.[3]

In the article "Organic farmers' perception of organic farming and the role of extension", the authors Bader AlhafiAlotaibi, Edgar Yoder, Mark A. Brennan, Hazem S. Kassem used

Objectives of This study is to identify the sources used by organic farmers to obtain information related to organic production and to assess the perceived attitudes of organic farmers towards extension services. Semi-structured in-depth interviews were conducted with 10 organic farmers in central Pennsylvania. Other organic farmers and organic farming organizations are two main sources of information. Organic farmers are already well versed in building social capital by seeking information to solve their problems and problems. The main challenges organic farmers face are insect and weed control, as well as weather-related issues. The results show that in addition to identifying possible sources of information, factors such as climate change adaptability and certification are critical for successful production in organic systems. This research provides rich and in-depth information on how farmers perceive organic agriculture and extension services. The results of the research conducted will enable cooperative planners, policy makers and extension workers to better understand farmers' perceptions in order to design viable and feasible policies and plans to address farmers' concerns and challenges. [4]

In the article, "Agbots: Weeding the field with a fleet of autonomous robots", author WyattMcAllisteraDenisOsipychevbAdamDaviscGirishChowdharyb used

. The goal of every farmer is that our production must be of quality and quantity to achieve the goal. For this purpose, we use the latest iodine technology to improve fertilization performance. . This work presents a coordinated strategy for multi-agent weed control under conditions of partial environmental information. The objective was to demonstrate the feasibility of coordinated strategies to improve the weeding performance of automated agricultural robots. It has been shown that with a sufficient number of agents, a group of automated robots can successfully weed fields with varying initial seed bank densities, even if it can take several days

before starting. weeding. Furthermore, it has been shown that the use of information sharing between agents greatly improves the performance of the system as the number of agents increases.
As an area to test these algorithms, a simulation environment called Weed World was developed that allows real-time visualization of coordinated weed control strategies and realistic weed production. . In this work, experiments were performed to determine the amount of agent required for initial seeding densities and different days allowed before weeding treatment was started.[5]

In the paper, "Implementing Artificial Intelligence in Agriculture to Optimize Irrigation and Application of Pesticides and Herbicides", the authors TanhaTalaviyaaDharaShahaNiveditaPatelbHiteshriYagnikcMananShahd

used Automation in agriculture as the major focus and emerging topics worldwide. The traditional methods that farmers use are not enough to meet these requirements. So new automated methods were introduced. These new methods meet dietary needs. Artificial intelligence in agriculture has brought about an agricultural revolution. This technology has protected crop yields from various factors such as climate change, population growth, employment problems and food security issues. These technologies avoid excessive use of water, pesticides, herbicides, maintain soil fertility, also contribute to efficient use of labor, increase productivity and improve quality. Different methods of soil water detection are discussed as well as two automated weeding techniques. The implementation of the drone is discussed, the different methods used by the drone to spray and monitor the crops are also discussed in this article. [6]

In the paper "Agricultural route planning with variable rate pesticide application in greenhouse environment", author UmarZanginaabSalindaBuyaminaM.S.Z.AbidinaM.S.A.Mahmuda used robots in performing agricultural tasks This has greatly improved productivity over the years by automating the execution of these tasks. activities such as spraying, harvesting, planting, etc. To optimize both yield and crop quality while minimizing costs, it is necessary to adopt navigational strategies. In this paper, the autonomy of agricultural mobile robots is reinforced in a structured environment (greenhouse farm) to determine an optimal path for the robot to work efficiently. Project Robust Vehicle Routing Problem (VRP) is designed to control the robot autonomously while making intelligent decisions to meet pesticide demand at each node (infected plants). An improved non-infectious genetic sorting algorithm (INSGA-III) was applied to solve this whole problem based on three (3) test cases performed with 8, 32 and 56 infected plants. respectively for confirmation. The obtained results show a compromise solution because Optimal INSGA-III is significantly worse than NSGA-III in terms of solution quality. On the other hand, significant reductions in execution time between 66%-76% and 76-93% were achieved for all test case scenarios for population sizes of 100 and 1500 respectively.[7]

In the paper, ” Remote Monitoring of Agricultural Robot using Web Application
” the authors MayaIshibashi*MichihisaIida*MasahikoSuguri*RyoheiMasuda* This paper describes a remote monitoring system of the agricultural robot using Web application. Authors developed the system in order to make clear condition about robot combine and adequately manage agricultural task data. The system makes the combine data accumulated in database so that it can be seen from remote-situated PC.[8]

In the paper, “Cooperative Control Protocol for Network Physical Systems in Agriculture
”, the authors PuwadolOakDusadeerungsikulaShimonY.NofaAvitalBecharbYangTaoc
In this article, a Collaborative Control Protocol for robotic systems and network physics & # 40; CCP-CPS & # 41; is a gift. CCP-CPS, allows the application of robots in the CPS system for smart and precision agriculture (AP), to monitor and identify stresses in greenhouse crops by means of superglass analysis. The role of CCP-CPS is to assign tasks to agents, identify and resolve conflicts and errors in the system, and to enable more effective cooperation and interaction between agents in CPS, compared to with a traditional non-collaborative and non-CPS approach. Collaborative control theory (CCT) is used for two system levels; protocol and agent level (CCP level), CPS and environment level (CPS level). Author use two case studies to test and validate our method with alternative approaches. The computer simulation results show that 1) CCP-CPS can determine the largest number of greenhouse sites containing constraints, 2) CCP-CPS can effectively use available resources (time), and 3) CCP-CPS can respond to an emergency stressful situation. faster and more tolerant of conflicts and system failures thanks to the integration of humans and a network-enhanced greenhouse system than other monitoring systems.[9]

In the article, "Heavy crop harvesting robot - Control algorithm " by author TatsukiKamata□ AliRoshanianfard□ □ NoboruNoguchi□ □ □ Agricultural robot system can be the answer to the labor shortage problem because They can increase work efficiency. Currently, in the world, there are many different types of agricultural robots, but most of them are developed based on improved systems from current agricultural machines such as tractors and combine harvesters. In some farming areas such as pumpkin areas, modification of existing platforms does not meet the requirements of smart farming. This study presents the development of a control algorithm for a harvesting robot specifically for heavy crops. This robotic system consists of a robot arm, an end effect and a control algorithm installed on the tractor robot. The objective of this study is to develop a control algorithm that can (1) approach the pumpkin's position accurately, (2) retrieve the squash accurately without damage, and (3) transport the squash to the truck. The Denevit-Hartenberg method is used for direct and inverse kinematics.[10]

In the article, "Research and development in agricultural robotics: A perspective of digital farming" by author Redmond Ramin Shamshiri1,2,3*, Cornelia Weltzien2, Ibrahim A. Hameed3, Ian J. Yule4, Tony E. Grift5, Siva K. Balasundram1, Lenka Pitonakova6, Desa Ahmad7, GirishChowdhary . This paper reviews some of the latest attainment in agricultural robotics, specifically those that are used for autonomous weed control, field scouting, and harvesting Digital farming is the practice of modern technologies such as sensors, robotics, and data analysis for shifting from monotonous operations to continuously automated processes. Object identification,task planning , initialize and gain of sensors are highlighted as some of the facing challenges in the context of digital farming. For the case of robotic harvesting, an autonomous framework with several simple axis operator can be faster and more efficient than the currently adapted professional expensive manipulators. While robots are becoming the inseparable parts of the modern farms, the Author conclusion is that it is not realistic to expect an entirely automated farming system in the future[11]

In the article, "A review of key techniques of vision-based control for harvesting robot" by author Yuanshen Zhao, Liang Gong, Yixiang Huang, Chengliang Liu . In a fruit or vegetable harvesting robot, vision sway is employed to solve two major problems in detecting objects in tree covering and picking objects using visual information. The author presents a review on these key vision control techniques and their potential applications in fruit or vegetable harvesting robots. With the help of agriculture robot technology we a amplify farming.

Although there is a rapid development of agricultural robotic technologies, a lack of access to robust fruit identifications and accuracy picking capabilities has limited the trade application of harvesting robots[12]

In the article, "Economics of robots and automation in field crop production" by author James Lowenberg-DeBoer, Iona Yuelu Huang, VasileiosGrigoriadis& Simon Blackmore. Productive and social research is needed to understand those developing country problems, and guide the engineers and scientists creating automation and robotic solutions.This study reviewed research bring out after 1990 on the economics of agricultural mechatronic automation and robotics, and identified research gaps. The present of abstracts narrowed the range to a dataset of 119 full text documents. After eligibility evaluation, 18 studies were subjected to a qualitative analysis, with ten focused on automation of specific agricultural operations and eight related to autonomous agricultural equipment. All of the studies found some structure in which automation and robotic technologies were commercial. Most of the studies reviewed estimated economic implications assuming that technology design parameters were achieved and/or based on data from illustration. Data are needed on the satisfaction and problems with using automation and robotics on farm. All of the studies reviewed were in the context of agriculture in expand countries, but many of the world's most pressing agricultural problems are in the developing world. Economic and social research is needed to understand those expands country problems, and guide the engineers and scientists forge automation and robotic solutions[13]

In the article, "Utilization of IOT and AI for Agriculture Applications" by author Niraj Prasad Bhatta, Thangadurai N.

The main objective of every farmer is production should be qualitative as well as quantitative so that objective fulfilled with the used of Iot in agriculture. Agriculture is necessary for one and all. The demand of Food product is increasing, with the increasing population. It seems to be irregular that there is slow advancement in the development of technologies in the field of agriculture that leads to the determined efforts as a result in qualitative as well as in quantities approaches. The Author proposed a system that access with the use of newest technology [14]

II. CONCLUSION:

In above paper is found that using modern technologies can control the cost, maintenance and monitoring performance. To meet the goal of farmer the Author use this mordern technology. in agricultural robotics, specifically those that are used for autonomous weed control, field scouting, and harvesting Digital farming is the practice of modern technologies such as sensors, robotics. Every farmer has goal that the production should be qualitative as well as quantitative that goal full fill with the help of smart agriculture Iot technology to enhance the production. The use of this mordern technology farmer strees will be reduce because that technology reduce the labour cost and save the farmers time.

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