AGRICULTURE ROBOTS–
NEW HOPES FOR AGRIBUSINESS

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INTRODUCTION

The first development of robotics in agriculture can be dated as early as the 1920s, with research to incorporate automatic vehicle guidance into agriculture beginning to take shape. This research led to the advancements between the 1950s and 60s of autonomous agricultural vehicles. The concept was not perfect however, with the vehicles still needing a cable system to guide their path. Robots in agriculture continued to develop as technologies in other sectors began to develop as well. It was not until the 1980s, following the development of the computer, that machine vision guidance became possible

Agricultural robot is a robot deployed for agriculture purposes. The main area of application of robots in agriculture today is at the harvesting stage. Agricultural robot or " Agribot " is a robot used for agricultural purposes. The advent of robots in agriculture drastically increased the productivity and output of agriculture in several countries. Further, the usage of robots in agriculture reduced the operating costs and lead time of agriculture. The current paper reviews the success stories of robotic agriculture in different areas of agriculture. The work also throws light on the future scope of robotic agriculture especially in developing countries.

Robots have been successfully used in several industrial

applications like material handling, material transfer, processing, inspection & quality control. The idea of mechanization (usage of automated equipment and robots) of agriculture was most obvious in recent years and there are many success stories of

robotic agriculture. The reasons for usage of robots in agriculture are to improve food quality and productivity, reduce labour costs and time. One more important reason for robotic agriculture is the unavailability of sufficient skilled man power in agricultural sector and it affects the growth of developing countries. Robots have successfully been used in agricultural activities like seeding, harvesting, weed control, grove supervision, chemical applications, etc. In India, about 70% of population is dependent on agriculture. In a research field off Highway 54 last autumn, corn stalks shimmered in rows 40-feet deep. Girish Chowdhary, an agricultural engineer at the University of Illinois at Urbana-Champaign, bent to place a small white robot at the edge of a row marked 103. The robot, named TerraSentia, resembled a souped up version of a lawn mower, with all-terrain wheels and a high-resolution camera on each side.

In much the same way that self-driving cars "see" their surroundings, TerraSentia navigates a field by sending out thousands of laser pulses to scan its environment. A few clicks on a tablet were all that were needed to orient the robot at the start of the row before it took off, squeaking slightly as it drove over ruts in the field.

"It's going to measure the height of each plant,"

It would do that and more. The robot is designed to generate the most detailed portrait possible of a field, from the size and health of the plants, to the number and quality of ears each corn plant will produce by the end of the season, so that agronomists can breed even better crops in the future. In addition to plant height, TerraSentia can measure stem diameter, leaf-area index and "stand count" — the number of live grain- or fruit-producing plants — or all of those traits at once. And robot science is working on adding even more traits, or phenotypes, to the list with the help of colleagues at Earth Sense, a spinoff company that he created to manufacture more robots.

Traditionally, plant breeders have measured these phenotypes by hand, and used them to select plants with the very best characteristics for creating hybrids. The advent of DNA sequencing has helped, enabling breeders to isolate genes for some desirable traits, but it still takes a human to assess whether the genes isolated from the previous generation actually led to improvements in the next one.

Today's agriculture has transformed into a high-tech enterprise that most 20th century farmers might barely recognize. After all, it was only around 100 years ago that farming in the US transitioned from animal power to robotic power. Over the past 20 years the global positioning system (GPS), electronic sensors and other new tools have moved farming even further into a technological wonderland.

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Agriculture robots are very useful then the humans. they are programmed to check each and every movement of the plants, field and other things also. Weed management is very long period way to manage the crop yield in the old time the weed is managed by the hands but now the bosch company which is basically named for making electronic and mechanical gadgets now they startup Deepfield robotics has designed the robot is called "bonirob" to manage the weed from the field in short time. they destroyed the large weed .

Farming robots are getting more advanced with every passing day. in the future, the autonomous robots will be able to do every farming task in agriculture filed.

• **Spray Drones :-** In agriculture the drones are play there main role with the help of drones the farmers can easily spray pesticides to the crop. It is very easy to use and easy to learn. it is use for step farming.

•**Di- Wheel :-** The DI-WHEEL consists of two power wheel. it can be put together approximately 6 min. it can easily transported from one place to another place. The track width of the vehicle can be adjust to fit different crop row width. in di- wheel various sensors can be attached in the connecting shaft.

• **Robotic Strawberry Harvester :-**
Made of stainless steel and military-grade aluminum, this electric-powered robot can robustly operate with a high degree of precision. Its self-reliant decentralized arms architecture makes it particularly easy to set and maintain. On board short-range integrated color and infrared depth sensors to capture all details. Cutting-edge graphic processing units helps to assess the fruit ripeness. The harvester does not contact the fruit. The robotics arms grip and cut the stem and then place into field container for later packing in consumer container.

• **RIPPA (Robot For Intelligent Perception And Precision Application):-**
At the University of Sydney, the Australian Centre for Field Robotics has developed RIPPA (Robot for Intelligent Perception and Precision Application), a four-wheeled, solar-powered device that identifies weeds in fields of vegetables and zaps them individually. At the moment it does this with precise, and precisely aimed, doses of herbicide. But it, or something similar, could instead use a beam of microwaves, or even a laser. That would allow the crops concerned to be recognized as "organic" by customers who disapprove of chemical treatments.

•**Farming Exoskeletons :-** The U.S. Department of Agriculture included—say farmers are superhorse. but those heroes are getting older. The average age of a farmer is now 50 to 58 years old, according to the 2012 USDA census of agriculture. This aging workforce is a major issue, especially in small and medium size farms, as is a lack of a generational stream of labor the industry once had. Scientists are addressing the problem with a solution certainly fit for a superhero—wearable exoskeletons, or supersuits. A team of engineers at Virginia Tech is working on lightweight, easy-to-use exosuits that ease pressure on a farmer's knees and back, reports Erica Corder for Virginia tech engineer magazine. Another group at the university is creating a robotic glove to help farmers with arthritis. The hope is that farmers will use the tech when they are say, in their 50s, so that they can age less painfully into their 60s and retire, explains Virginia Tech engineer Alexander Leonessa in a press release .