

## Agricultural Robots – The Farmers of The Future

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### Introduction

A robot is a mechanical, artificial agent and is usually an electromechanical system. It is a device that, because of software programming, makes complicated tasks easy to perform. Agricultural robotics is the use of automation in bio system such as agriculture, forestry and fisheries. It is replacing the conventional techniques to perform the same tasks with efficiency.

Applying automation to agriculture has helped create several advancements to the industry while helping farmers save money and time.

### Why agricultural robots are preferred –:

We can expect the robots to perform agricultural operations autonomously such as spraying and mechanical weed control, fruit picking, watching the farms day & night for an effective report, allowing farmers to reduce the environmental impact, increase precision and efficiency and manage individual plants in novel ways.

### Techniques involving agricultural Robots -:

Process like ploughing, seeding, fertilizing, weeding, harvesting, spraying etc require large amount of man power. Hence in order to reduce this need, and save time and money, robots are essential.

### Types of robots used in agriculture -:

- Demeter (used for harvesting)
- Robots for weed control
- Forester robot.
- Robot in horticulture
- Fruit picking robot

✚ **Field robots** – work with respect to environment and medium. They change themselves according to the required condition.

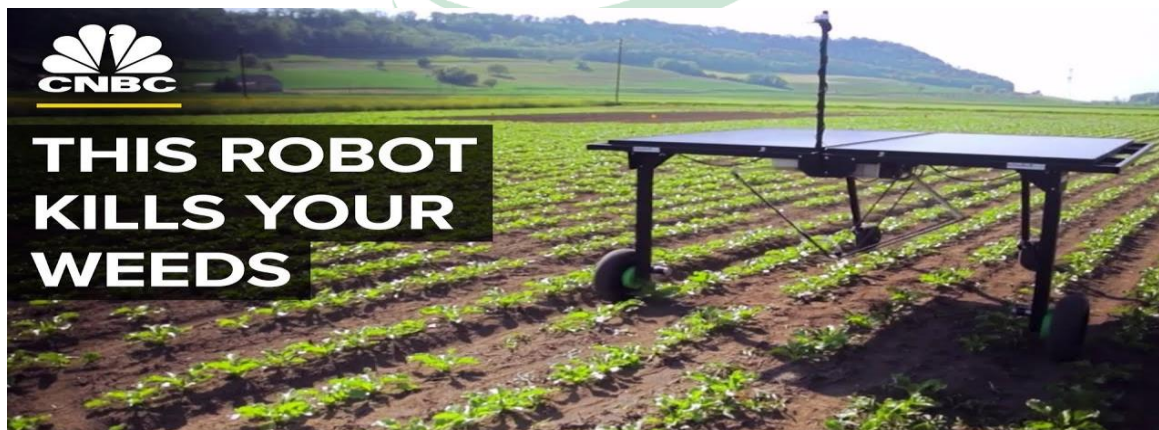
✚ **Mobile robots** – are those which possess mobility with respect to a medium. The entire system moves with respect to environment.

✚ **Demeter – Robot farmer:** Demeter is a robot that can cut crops it looks like a normal harvester, but can drive by itself without any human supervision. It has cameras on it that can detect the difference between the crop that has been cut and crop that hasn't. The Demeter system strives to provide three levels of automation.

- a) First a “cruise control” feature. Which will automatically steer, drive and control the harvesting header, will be provided to harvester operators.
- b) “drone” feature will be provided, allowing one operator to remotely control several harvesters.
- c) Thirdly, a fully autonomous machine will be developed that will allow a harvester to completely harvest a field with no human supervision.



1. **Weed Controller:** A four wheel -drive weed seeking robot was developed and the task of the weed removing device is to remove or destroy the weed. Crops that are grown in rows can be weeded by running a hoe between the crop rows. An intelligent hoe uses vision system to identify the rows of crops and steer itself accurately between them, considerably reducing the need for herbicides. Weed identification is based on colour photography. The equipped robot helps production of weed maps identifying plant.



2. **Robotic Gantry:** Traditional spraying can be very efficient, especially when they cover large areas. The robotic gantry could apply both liquid sprays and fertilizer and be able to regulate itself according to current weather conditions.



3. **Forest Robots (Treebot):** A fearless mobile robot is helping scientists monitor environmental changes in forests. Treebots consists of combine networked sensors, a webcam and a wireless net link. It is solar – powered and moves up and down special cables to take samples and measurements for vital analysis. It is very important in the biology community to understand the interaction between the atmosphere and the forest environment.
4. **Forester Robot:** this is a special type of robots used for cutting up of wood, tending trees and pruning of X – Mass tree and for harvesting pulp and hard wood and in the forests. It employs a special jaws and axes for chopping the branch.

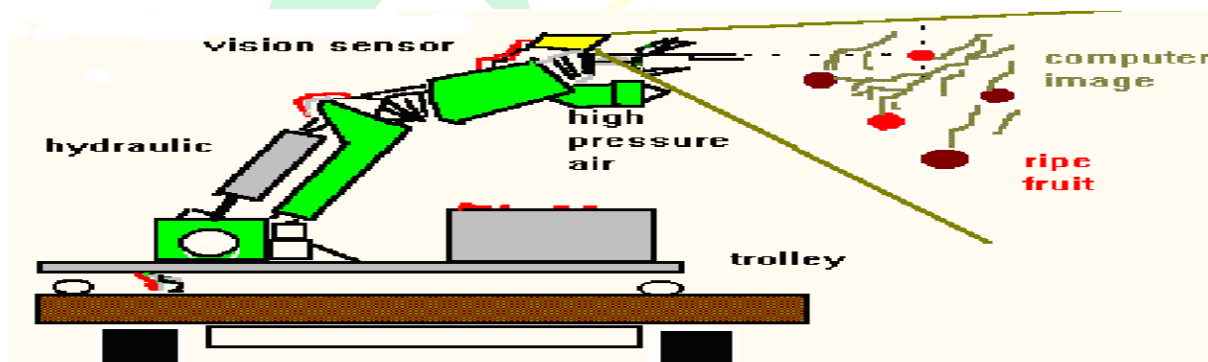


5. **Robots in Horticulture -:** In automatic mode, a fully charged Robo – mower can typically mow a lawn of 2500 to 3200 square ft. Depending on the numbers of obstacles in its path, slopes, height of grass, humidity etc.





**6. Fruit picking Robots :-** The fruit picking robots need to pick ripe fruit without damaging the branches or leaves of the tree. The robots must be able to access all areas of the tree being harvested.



#### **Advantages of using agriculture Robots :-**

- Agriculture robots are capable of collecting crop and soil samples.
- They are small in size, which allows them to be able to accumulate data close to the crops.
- They are also capable of mowing, spraying pesticides, finding diseases or parasites and performing mechanical weeding.
- Agricultural robots may have cameras and sensors which detect weeds and other forms of stress.