Perspective

Smart Farming System with New Agriculture Technology

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1. Introduction

Innovations are more important than ever in modern agriculture. The industry as a whole is facing huge challenges, rising supply costs, labor shortages and changes in consumer preferences for transparency and stability. Recognition is growing from agriculture corporations that solutions to these challenges are needed. Over the past 10 years, agricultural technology has seen tremendous growth in investment, with $ 6.7 billion invested in the last 5 years and $ 1.9 billion in the same period last year. Major technological innovations in space have focused on areas such as indoor vertical farming, automation and robotics, livestock technology, advanced greenhouse techniques, precision farming and artificial intelligence and block chain.

2. Description

2.1. Indoor Vertical Farming

Indoor vertical farming can increase crop yields, overcome limited land area and also reduce the impact of agriculture on the environment by reducing the distance traveled in the supply chain. Indoor vertical farming can be defined as a method of increasing production by stacking one on top of the other in a closed and controlled environment. By using vertically mounted growing shelves, the amount of land space required to grow plants can be significantly reduced compared to traditional farming methods. This type of growth is often associated with urban and urban agriculture due to its ability to thrive in limited space. Vertical farms are unique in that some setups do not require soil to grow plants. Mostly hydroponic, where vegetables grow in a nutrient-dense water bowl or aero panic, where plant roots are regularly sprayed with water and nutrients. Instead of natural sunlight, artificial grow lights are used. From sustainable urban growth to increased crop yields with reduced labor costs, the benefits of indoor vertical farming are clear.

2.2. Agricultural Automation

Farm automation, sometimes known as "smart farming" is a technique that improves the efficiency of farms by automating the crop or livestock production cycle. Drones, autonomous tractors, robotic harvesters, automatic water and sowing robots are among the robotics innovations being developed by growing enterprises. Despite the fact that these technologies are still in their infancy an increasing number of traditional farming enterprises are incorporating agricultural automation into their operations.

New advances in technology from robotics and drones to computer vision software, have completely transformed modern agriculture. The primary goal of agricultural automation technology is to cover mundane tasks easily. Some of the major technologies commonly used by farms are: crop automation, autonomous tractors, seed and weeding and drones.

2.3. Livestock Breeding Technology

Livestock technology improves or enhances productivity efficiency, welfare or animal and

livestock management. The concept of a 'connected cow' was born out of the installation of sensors for more dairy cattle to monitor health and increase productivity. Placing individually wearable sensors on livestock can track daily activity and health issues by providing data based insights into the entire herd. All of this data generated is also being transformed into meaningful, actionable insights where producers can look quickly and easily to make quick management decisions.

2.4. Modern Greenhouses

In recent decades, the greenhouse industry has transformed from small scale facilities primarily used for research and aesthetic purposes (*i.e.* botanic gardens) to more large scale facilities that compete directly with land based traditional food production. Together, the entire global greenhouse market currently produces US $350 billion worth of vegetables a year, including U.S. Production is less than one percent. Nowadays, due to the recent improvements in the growing technology, the industry is developing like never before. Greenhouses today are large-scale, capital-driven and urban centric development.

2.5. Precision Agriculture

Agriculture is changing, and technology is becoming an increasingly important aspect of commercial agriculture. New precision farming businesses are creating technology that will allow farmers to increase yields by managing every variable in crop production, including moisture levels, pest pressure, soil conditions, and micro climate. Precision farming allows farmers to increase efficiency and reduce expenses by providing more accurate methods for planting and growing crops.

2.6. Block Chain

The ability to track block chain ownership records and tamper resistance can be used to address emergencies such as food fraud, security recalls, supply chain inefficiency and food traceability in the current food system. Block chain's unique decentralized structure ensures certified products and practices to create a market for premium products with transparency.

2.7. Artificial Intelligence

The rise of digital agriculture and related technologies has ushered in a slew of new data sources. Remote sensors, satellites, and Unmanned Aerial Vehicles (UAVs) can collect data on the entire area 24 hours a day. They can keep track of plant health, soil conditions, temperature, and humidity, among other things. The amount of data that these sensors may generate is enormous, and the value of numbers is lost in the avalanche of data. Its purpose is to enable farmers to better understand the situation on earth through advanced technology (such as remote sensing) that can tell their situation more than they can see with the naked eye. And it is also much faster than accurate or more accurate than walking through the fields.

3. Conclusion

Remote sensors enable algorithms to understand the field environment as statistical data, which can be used by farmers to understand and make decisions. Algorithms process data adapt and learn based on the data received. The more inputs and statistical information collected, the better the algorithm in estimating the range of results. And the goal is that farmers can achieve a good crop by making good decisions in the field using this artificial intelligence.