China Agricultural Internet of Things

It is to form a monitoring network with a large number of sensor nodes, collect information through various **sensors**, so as to help farmers find problems in time and accurately determine the location of the problem. In this way, agriculture will gradually shift from a production model centered on manpower and relying on isolated machinery to a production model centered on information and software, thereby using a large number of various automated, intelligent, and remotely controlled production equipment.

Chinese name: 中国农业物联网

Industry: **Agriculture**

Internet of Things: The Internet of Things is recognized by the world as the third wave of the world's information industry after computers, the Internet and mobile communication networks. It is a network that realizes the full interconnection between people, people and things, and things and things based on perception. Behind this, various microchips are implanted in objects, and these sensors are used to obtain various information of the physical world, and then they are interactively transmitted through various communication networks such as local wireless networks, the Internet, and mobile communication networks, so as to realize the perception of the world.

In traditional agriculture, farmers rely on experience and feelings for watering, fertilizing, and spraying. Today, the production base of facility agriculture sees a different picture: Should fruits and vegetables be watered? How to maintain accurate concentrations when fertilizing and spraying pesticides? How to implement on-demand supply of temperature, humidity, light, and carbon dioxide concentration? A series of problems that were once "fuzzy" in different growth cycles of crops are all "precisely" checked in real time by the information-based intelligent **monitoring system**. Farmers only need to press a switch, make a choice, or completely listen to "instructions" to grow good vegetables and flowers.

Based on the computer Internet, **RFID**, **wireless data communication** and other technologies are used to construct an "Internet of Things" covering everything in the world. In this network, objects (commodities) can "communicate" with each other without human intervention. Its essence is to use **radio frequency automatic identification** (RFID) technology to realize the automatic identification of objects (commodities) and the interconnection and sharing of information through the computer Internet.

(1) Identify the properties of the object, including static and dynamic properties. Static properties can be directly stored in the tag, while dynamic properties need to be detected by sensors in real time.

(2) The identification device is required to complete the reading of the object properties and convert the information into a data format suitable for network transmission.

(3) The object information is transmitted to the information processing center through the network (the processing center may be distributed, such as a computer or mobile phone at home, or centralized, such as China Mobile's IDC), and the processing center completes the relevant calculations of the object communication.

In the Beijing Oriental Coast Precision Agriculture Demonstration Zone, the Internet of Things "perception" precision agriculture technology is experienced everywhere. In the control room of the fresh cut flower production base, a large screen for greenhouse environment monitoring is hung on the wall. In the digital strobe table, the temperature, humidity, light, and carbon dioxide concentration in the 59 greenhouses are clearly visible.

Suddenly, the humidity display of Shed A1 changed from green to red: 85%! The technician immediately turned on the network video voice monitoring system next to it, clicked on "a row of greenhouses" and issued an order: "The humidity is high, please open the vents and skylights!"

On the video screen, a farmer operator immediately took action.

10 minutes later, the system replied with a voice: "All turned on." On the big screen, the red number immediately dropped and soon returned to green: 70%.

"These real-time monitored environmental indicators can automatically alarm, green means normal, and red means alarm." This greenhouse environment monitoring and intelligent control system "captures" various data through indoor sensors, which are summarized by the data acquisition controller and analyzed and processed by the computer in the central control room, and the results are displayed on the screen immediately.

The management personnel can command at any time through another technology - video voice monitoring system. The base manager has been engaged in farming for more than 20 years and is considered a good hand, but he listens to the "system" all the time. He said: "In the past, we relied on our feelings. If we felt the greenhouse was cold, we would heat it up, and if we felt it was dark, we would add light. Everyone is convinced by the scientific data under intelligent monitoring!"

Like the fresh cut flower production base, Fangshan has demonstrated and promoted precision agricultural technology in 5 towns and 16 villages, including intelligent greenhouses, automatic **outdoor weather monitoring**, negative head precision irrigation, liquid fertilizer precision application, electrostatic precision spraying... 16 information technology patents, real-time quantitative monitoring of the temperature, humidity, light, carbon dioxide concentration, etc. required by crops in different growth cycles, adjusting the input of water, fertilizer and medicine, and helping farmers achieve a higher level of intensive farming.

The **agricultural Internet of Things** demonstration base has been launched in more than 100 counties and cities across the country. In the near future, my country's agricultural modernization, intelligentization, and large-scale production will surely be realized, and it will be able to ensure the rapid growth of my country's grain production. Effectively guarantee my country's food safety.