

# Introduction to Agricultural Engineering Equipment and Automation Research Team, Zhejiang University of Technology



**Zhang Libin**, the President of Zhejiang University of Technology, Professor, doctoral supervisor, "High Class Expert of Zhejiang Province". He has been involved in the research of agricultural engineering equipment and automation for more than 20 years and obtained outstanding achievements in the field of agricultural engineering. He was awarded "100 Excellent Chinese Overseas Returnees" by Chinese government in 2003, "The Science and Technology Development Contribution Prize" by Chinese Society of Agricultural Engineering in 2007. He established the research team of Agricultural Engineering Equipment and Automation in 2000 and key innovation team of Modern Agricultural Equipment and Facilities to Industry of Zhejiang Province in 2008. The research team is composed of 10 Professors and 4 doctoral supervisors, including one awarded with "High Class Expert of Zhejiang Province", one with "National New Century BAIQIANWAN talents" and two with "Young Scientist of Outstanding Achievement of Zhejiang Province".

The main research field of agricultural engineering equipment and automation research team includes: small agricultural and mechanical product design and development, industrial agricultural equipment, agricultural robot and intelligent control, fluid power transmission and control. The projects that the team undertook and accomplished in recent years are: the key international cooperation project from Ministry of Science and Technology of China, National Science and Technology Supporting Program of the 11th "Five-Year-Plan" of China, 863 High Technology Plan Program, projects funded by National Natural Science Foundation of China, 973 Prophase Special Fund project, "948" Project of Ministry of Agriculture of China, Key Special Subject of Science and Technology Program of Zhejiang Province, Project of Tackling Key Problems in Science and Technology of Zhejiang Province, projects funded by Natural Science Foundation of Zhejiang Province, Science and Technology Cooperation Program between Chinese and Italian government, etc. The relevant research achievements received various levels of awards and prizes including one item of "the 2nd Level Prize of State Scientific and Technological Invention", one piece of "the 2nd Level Prize of State Scientific and Technological Progress" and two "1st Level Prize of Scientific and Technological Progress (at ministerial level)". The research team has already built broad academic cooperation and communication relationships with universities and research facilities from Italy, Belgium, Holland, Germany, USA, etc.

## (1) Small Agricultural and Mechanical Product Design and Development

The key technology and product development research on small agricultural machinery have already formed products with four main series and more than 20 types, which are launched into both domestic and foreign markets. The relevant technology and products were awarded "The 1st Level Prize of Scientific and Technological Progress of Zhejiang Province", "The 1st Level Prize of State Science and Technology (nominated by Ministry of Education)" and "The 2nd Level Prize of State Scientific and Technological Progress" (Year 2004).

## (2) Modern Facility Agricultural Engineering and Equipment

The greenhouse automatic control system with capabilities of low cost and high reliability, and whole intelligent technology and complete sets of equipment which integrated supervision and control functions based on crop growth and development characteristics, including communication network control equipment, monitoring instrument, actuator and etc. The relevant technology is highly suitable to China's actual situation and has completely independent intellectual property.

## (3) Agricultural Robot and Intelligent Control

The agricultural picking robot system with independent intellectual property, which includes: robot driving joint system, robot end effector system, robot vision system, robot navigation system, robot walking system and robot control system. The relevant technology can be used in the automatic picking task of fruits and vegetables such as cucumber, apple, orange and etc.

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