

Summary of Achievements: "Development and Application of Key Equipment and Organic Substrates in Greenhouse" Project



"Development and Application of Key Equipment and Organic Substrates in Greenhouse" project undertaken jointly by Jiangsu University and other institutes, has integrated engineering technology with agronomy to form a whole set of equipment and technology of facility agriculture that include greenhouse design, climate control technology, development of the organic substrates and high-yielding cultivation techniques. The achievements have reached the international advanced level. Reed residue organic substrate is put forward at first time in China and abroad. The situation has been remedied that foreign technology was imitated in climate control and the most of high-grade greenhouse and organic substrates were imported. Six innovative patents and nine new utility model patent applications were granted. First Grade Prize Technology Advance Award of Ministry of Education was awarded, five Second Grade Prizes were awarded by industrial sector and the province, and Second Grade Prize of National Science and Technology Progress was awarded in 2009.

The project team creatively puts forward the climate dynamic control technology based on model and maximum ratio of economic output-input, and develops a low-cost and high-reliable greenhouse climate controller and hardware and software system of greenhouses with the distributed automatic control system, which realizes all-weather optimal climate control. Studies are made systematically for the dynamic variation of climate factors, such as temperature, illumination, humidity, water and CO₂, as well as the action mechanisms. The interface is also solved between model and climate control. Focusing on structural optimization and energy conservation a series of intelligent multi-span greenhouse is developed which has efficient ventilation, good heat preservation and ability of resisting rain and snow, with innovative design. It is suitable for subtropical climate in China.

The innovative research has been conducted on substrate-recycling to resolve reed residues due to the local paper making and vinegar residue that are difficult to deal with for a long-time. Reed residues and vinegar residues are difficult to be fermented, and not suitable for physical and chemical properties, without direct use. To overcome these common difficulties, high-efficient microflora has been selected firstly specific to reed residues and vinegar residues, and then fermentation recipe is developed, production technology is presented. It achieves the objectives of completing fermentation within 30 days. A series of products for reed residues and vinegar residue substrates are developed at the first time, and the number of products is 21.



Contact means:

Person in charge: Mao Hanping

Institute of Agricultural Engineering, Jiangsu University,

No. 301, Xuefu Road, Zhenjiang, 212013, China

Phone: (+86)0511-88797338

Email: maohp@ujs.edu.cn