

# National Center for International Collaboration Research on Precision Agricultural Aviation Pesticide Spraying Technology

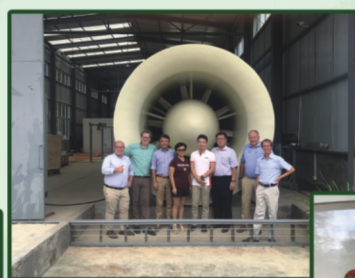
"National Center for International Collaboration Research on Precision Agricultural Aviation (PAA) Pesticide Spraying Technology" is the national research center approved by the Ministry of Science and Technology of China. The Center focuses on aerial plant protection for typical food crops and economic crops, and jointly carry out innovation research on key technology and common issues for agricultural aviation remote sensing, precision aerial variable spraying and other related technologies and equipment with the USDA ARS Aerial Application Technology Research Unit (USDA-ARS-AATRU), the Center of Pesticide Application and Safety, the University of Queensland, Australia, and other world-class research institutions in advanced agricultural aviation application technologies in order to promote the development of precision agricultural aviation technology.

The Director and the Lead Scientist of the Center is Professor Yubin Lan, who is the member of European Academy of Sciences, Arts and Humanities (EASAL), the Chair of CIGR Precision Aerial Application Working Group, the President of the Society for International Precision Agricultural Aviation (SIPAA), and the Co-Editor-in-Chief of International Journal of Precision Agricultural Aviation (IJPA).

The research team of the Center is composed of more than 50 faculty members plus over 60 MS/PhD students from agricultural engineering, mechanical engineering, electronics, communications, mechanics, computer engineering, plant protection and other various disciplines. The Center is equipped with nine specialized laboratories of agricultural aviation application technologies, including Agriculture Airborne Remote Sensing Laboratory, Agriculture Aerial Work Platforms Research Laboratory, Agriculture Aerial Spraying Research Laboratory, Agriculture Aviation Testing Technology Laboratory, Agriculture Aerial Spraying Efficacy Evaluation Laboratory, Agriculture Aviation Sensor Development Laboratory, Agriculture Aviation Big Data Laboratory, Agriculture Aviation Industry-Education-Research Cooperation Laboratory, and Agriculture Aviation Artificial Intelligence Laboratory.



Facility and equipment of the Center for agricultural aviation technology research is at the advanced level in China. The agricultural aviation wind tunnel laboratory, completed in May 2017 with the total area of about 6000m<sup>2</sup>, was designed and constructed based on the latest international ISO standard ISO22856-2012. The wind tunnel is the first combined wind tunnel in China with high-speed and low-speed function especially for agricultural aviation research. It is also one of the most advanced wind tunnels in agricultural engineering area of the world.



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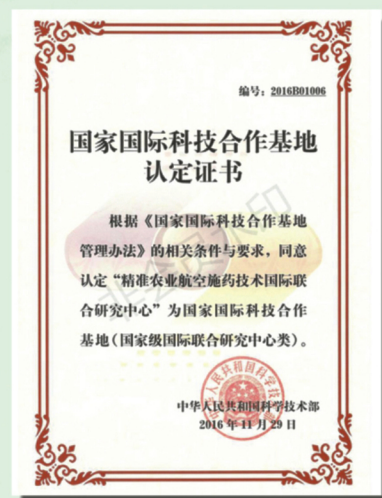
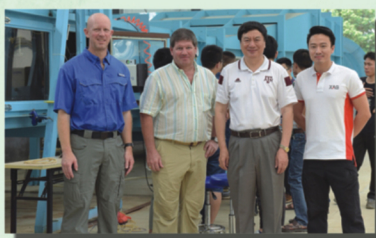
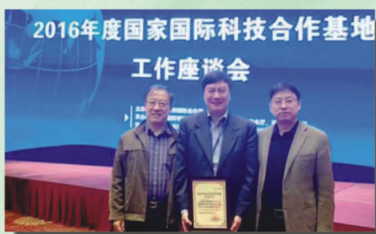
The Center has dedicated to carry out research on Precision Agricultural Aviation (PAA), Aerial Pesticides Spraying Technology and Application, Droplet Deposition Distribution of Agricultural UAVs, Agricultural Information Acquisition and Analysis with Low Altitude UAV Remote Sensing, Intelligent Control Systems of Agricultural UAVs, Critical Components, Control Technology and Equipment for Agricultural UAV Precision Spraying, Agricultural UAV Performance Test Platform and Other Key Technologies. The Center has established five Sub-centers at the USDA ARS Aerial Application Technology Research Unit (USDA-ARS-AATRU) in the United States, the Center of Pesticide Application and Safety, the University of Queensland in Australia, Ag-Nav Inc. in Canada, Harper Adams University in the United Kingdom, and PMAS-Arid Agriculture University Rawalpindi in Pakistan.

Up to now, the Center has been presiding over and undertaking more than 20 key national and provincial projects, including 2016 pilot project “High Efficient Ground and Aerial Spraying Technology and Intelligent Equipment” of the National Key Research and Development Plan “Research and Development of Integrated Technologies for Reduced-Applications and Increased-Efficiencies of Chemical Fertilizers and Pesticides”, projects from the Natural Science Foundation of China, key projects of Guangdong

Province, and other agricultural aviation research projects with the total research funding over a hundred million Yuan.

Dr. Yubin Lan is the Founder and Chair of the “International Conference of Precision Agricultural Aviation”. Six sessions of “International Conference of Precision Agricultural Aviation” have been successfully held since 2008 every two years. Aerial Application Technology Research Unit of the United States Department of Agriculture (USDA) organized the first three sessions. The Center had held the 4th, 5th and 6th Conference in 2014, 2016 and 2018, respectively. During the 6th “International Conference of Precision Agricultural Aviation” the Center has announced to found the Society for International Precision Agricultural Aviation (SIPAA), and to start the International Journal of Precision Agricultural Aviation (IJPAA) in order to further promote international academic exchanges of agricultural aviation, and enhance agricultural aviation research and application in the world.

The research platforms of the Center also include “Precision Agricultural Aviation Application Technology Research Overseas Expertise Introduction Center for Discipline Innovation (111 Center)” approved in August, 2018 by the State Administration of Foreign Experts Affairs and the Ministry of Education of China, “International Laboratory of Agricultural Aviation Pesticide Spraying Technology” and “International Laboratory of Agricultural Aviation Applied Technology” approved by Guangdong Province in 2015. These important platforms have played an important role for future international exchanges and cooperation on personnel training, joint aerial spraying tests, research and development of key technology and equipment for precision agricultural aviation, etc.



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International Journal of Agricultural and Biological Engineering (IJABE)

ISSN 1934-6344, eISSN 1934-6352

Website: <https://www.ijabe.org>