

Institute of Plant Protection, Chinese Academy of Agricultural Sciences

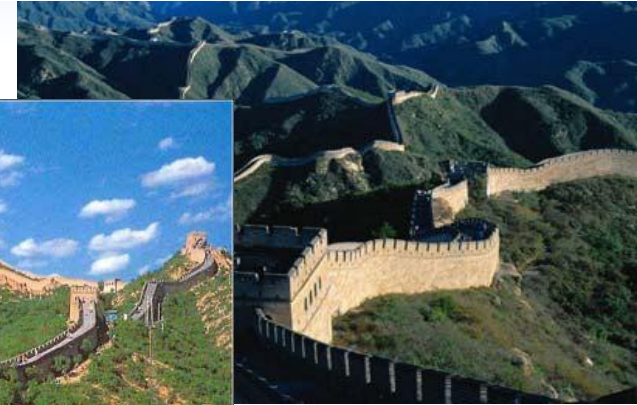
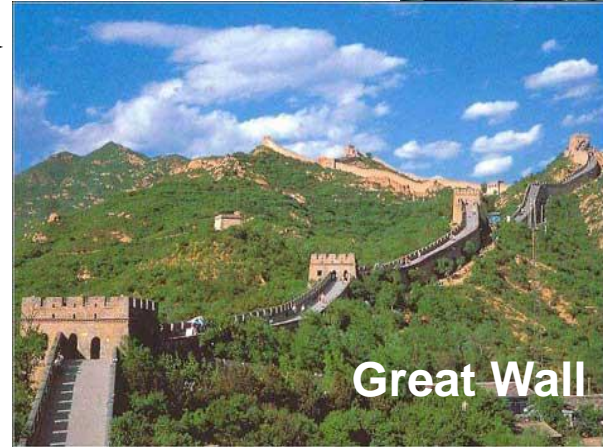
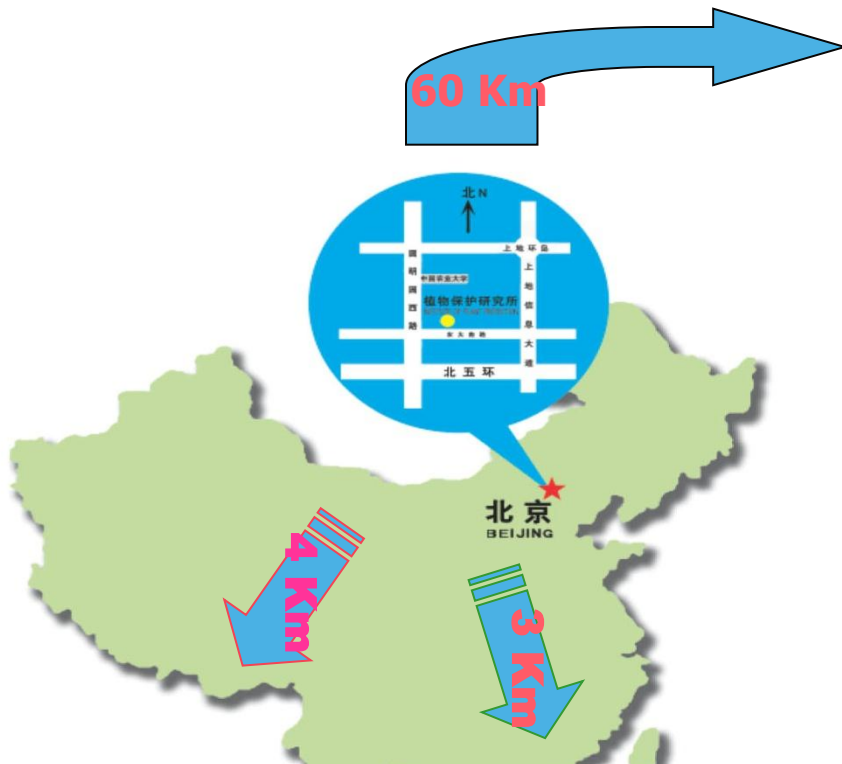




A brief introduction

**of Institute of Plant Protection, Chinese
Academy of Agricultural Sciences (IPP-CAAS)**

Location and Address



**No.2, Yuan Ming Yuan West Road,
Beijing 100193**

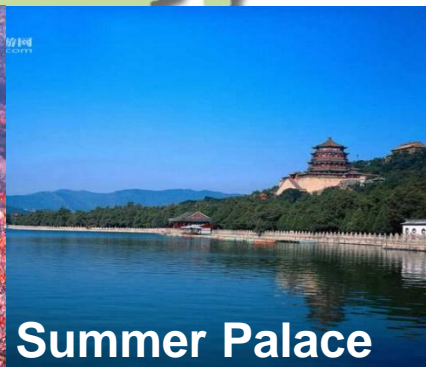
P. R. China

Tel: +86-10-62813685

Fax: +86-10-62812779



Fragrant Hill



Summer Palace

Background and History

A non-profit national institute dedicated to both basic and applied sciences of plant protection

- ❖ **Founded in 1957**
- ❖ **Moved to Henan Province in 1970**
- ❖ **Got back to Beijing in 1980**

Organization

Administrative Departments

- ✓ Dept. of Research Management
- ✓ Dept. of Human Resources
- ✓ Dept. of Financial Management
- ✓ Dept. of Achievement Transformation
- ✓ Dept. of International Cooperation and Graduate Student
- ✓ General Office

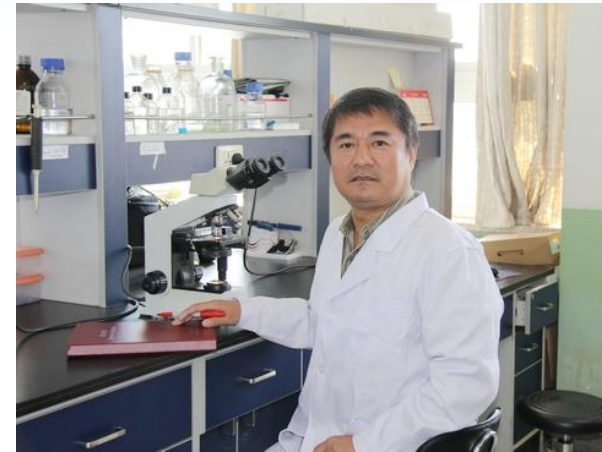
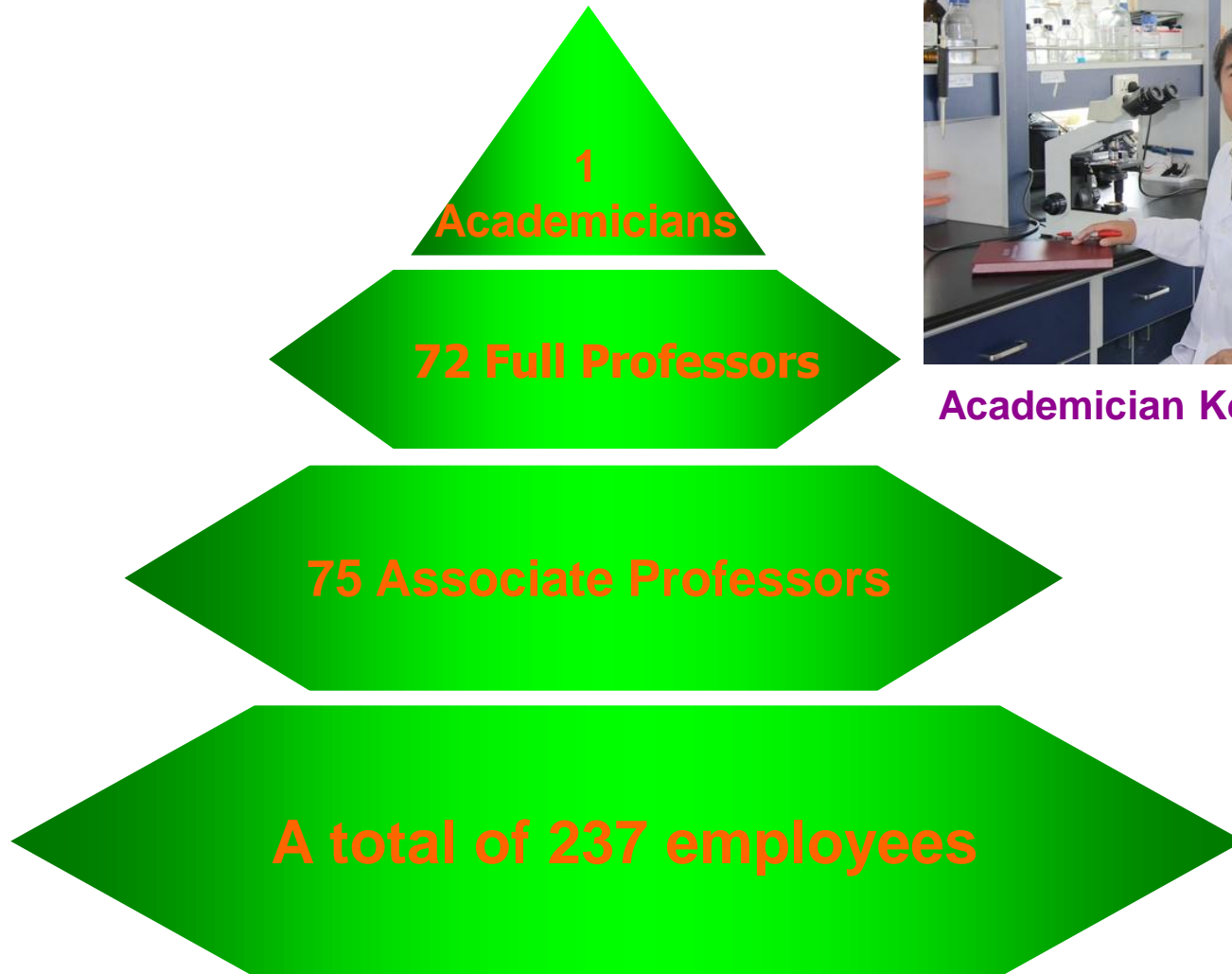
Research Departments

- ✓ Dept. of Plant Pathology
- ✓ Dept. of Agricultural Entomology
- ✓ Dept. of Pesticide Sciences
- ✓ Dept. of Biological Control
- ✓ Dept. of Biological Invasions
- ✓ Dept. of Weed & Rodent Sciences and Plant Protection in Grassland
- ✓ Dept. of Biotechnology for Plant Protection

Service Departments

- ✓ Logistics service center
- ✓ Zhongbao Group Co.
- ✓ Langfang Experimental Station

Faculties and Staffs□



Academician Kongming Wu

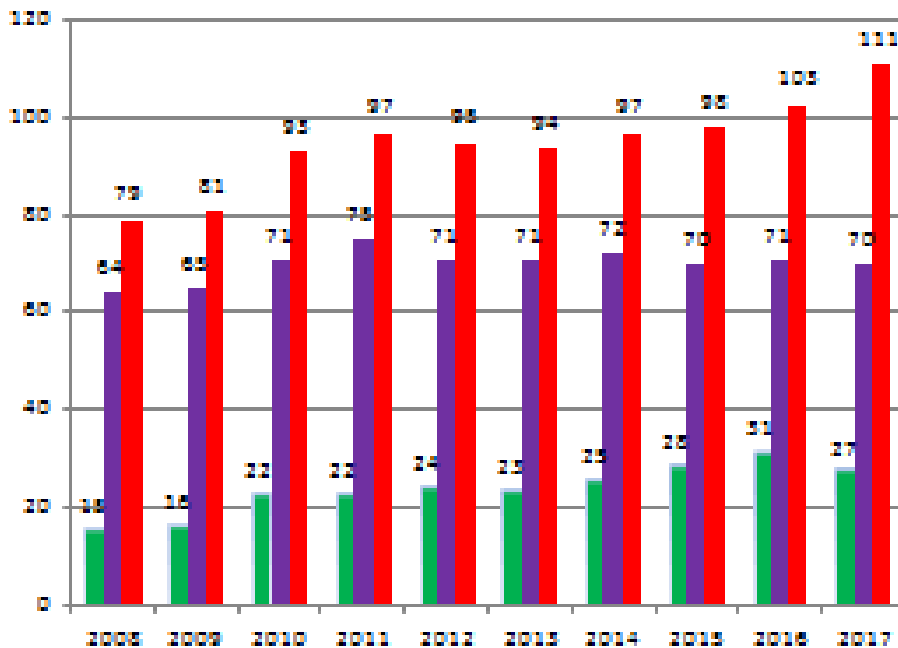
● Team Construction:

17 teams selected in the Agricultural Science and Technology Innovation Program (ASTIP) in CAAS

- Epidemics and Control of Crop Fungal Diseases (PI: Prof. CHEN Wanquan)
- Epidemics and Control of Crop Virus Diseases (PI: Prof. WANG Xifeng)
- Epidemics and Control of Crop Bacterial Diseases (PI: Prof. ZHAO Tingchang)
- Monitoring and Control of Insect Pests on Food Crops (PI: Prof. WANG Zhenying)
- Monitoring and Control of Insect Pests on Cash Crops (PI: Prof. LU Yanhui)
- Protection and Application of the Natural Enemies (PI: Prof. XU Xuenong)
- Monitoring, Prevention and Management of Farmland Weeds (PI: Prof. CAO Aocheng)
- Pests Monitoring and Management in Rangeland (PI: Prof. ZHANG Zehua)
- Pesticide Chemistry and Application (PI: Prof. ZHENG Yongquan)
- Development and Application of Bio-pesticides to Insect Pests (PI: Prof. ZHANG Jie)
- Development and Application of Bio-pesticides to Plant Diseases (PI: Prof. QIU Dewen)
- Prevention and Management of Agricultural Invasive Species (PI: Prof. WAN Fanghao)
- Safety Assessment and Management of Biotechnology Crops (PI: Prof. PENG Yufa)
- Functional Genomics for Crop Pathogens and Insects (PI: Prof. ZHOU Xueping)
- Epidemics and Control of Crop Nematode Diseases (PI: Prof. PENG Deliang)
- Biosynthesis and Regulation of Natural Products Pesticides (PI: Prof. XIANG Wensheng)
- Monitoring and Control of weed (PI: Prof. LI Xiangju)

Education & Training□

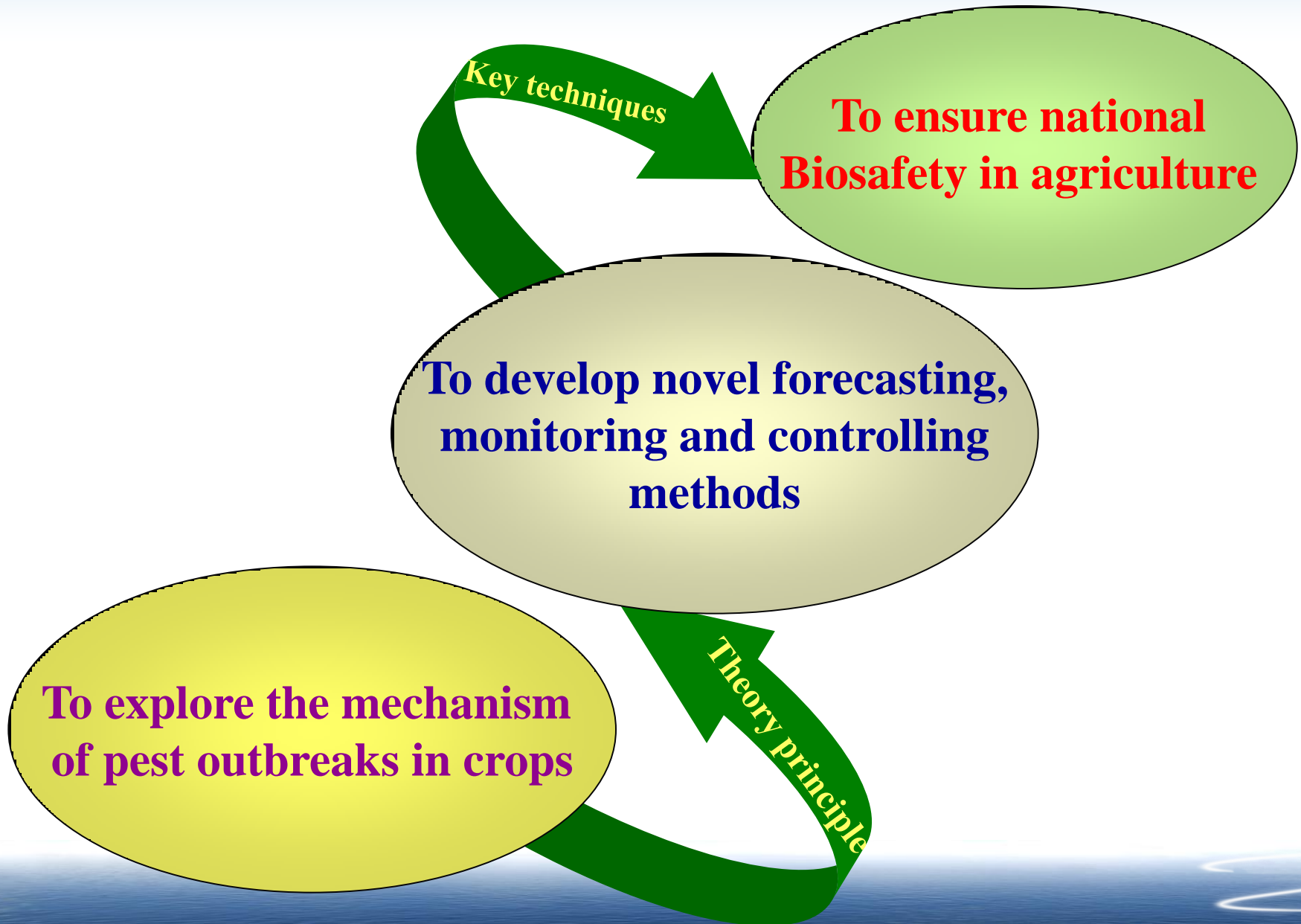
621 graduate students in
IPP-CAAS in 2017,
including **30** international
students



Number of PhD and Master students



Mission and Goal



Disciplines

- ❖ **Plant pathology**
- ❖ **Agricultural entomology**
- ❖ **Pesticide science**
- ❖ **Biological control**
- ❖ **Invasive species management**
- ❖ **Biosafety of GM crops**
- ❖ **Weed science**
- ❖ **Rodent management**

Research Areas

— Plant Pathology

- ❖ Plant-pathogen interaction
- ❖ Biology and pathogenicity of pathogen
- ❖ Integrated plant disease management
- ❖ Epidemiology & forecasting of plant diseases



Wheat rusts



Rice bacterial blight



Powdery mildew



Cotton *Fusarium* wilt



Rice stripe virus



Soybean cyst nematode



Potato bacterial blight



Cotton bollworm
Helicoverpa armigera

Agricultural Entomology



Wheat aphids
(*Rhopasiphum padi*, *Sitobion avenae*)

- ❖ Integrated insect pests management
- ❖ Insect biology and behavior
- ❖ Insect ecology
- ❖ Monitoring and forecasting of insect pests



Cotton blind stink bug
Apolygus lucorum



Asian corn borer
(*Ostrinia furnacalis*)



Beet webworm
(*Loxostege sticticalis*)



Army worm
(*Mythimna separata*)



Pesticide Science



- ❖ Chemical synthesis of pesticides
- ❖ Pesticide formulation
- ❖ Biology, application technology of pesticides
- ❖ Pesticide environmental toxicology



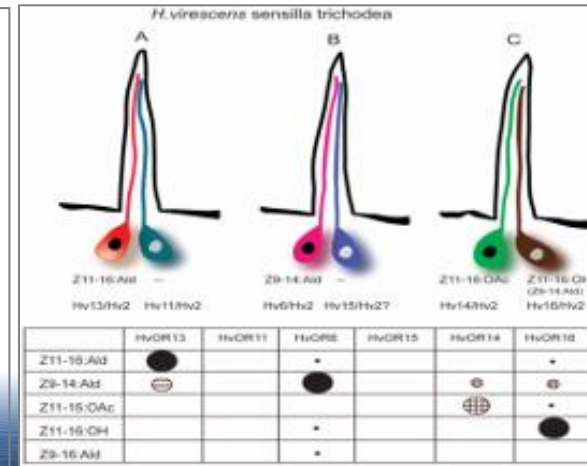
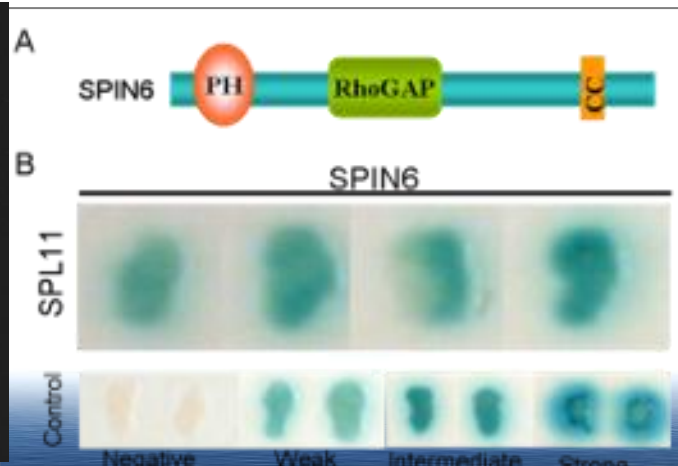
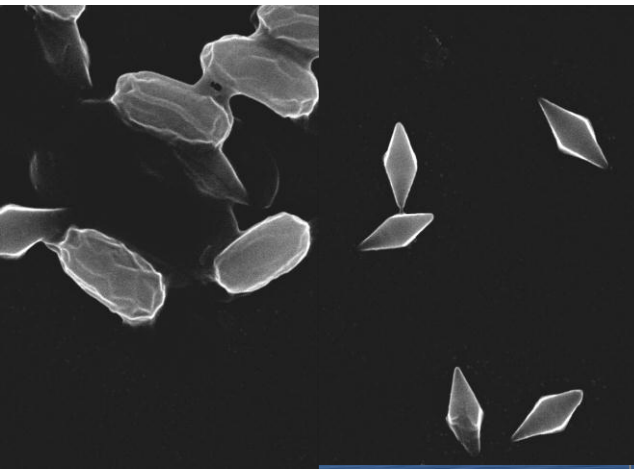
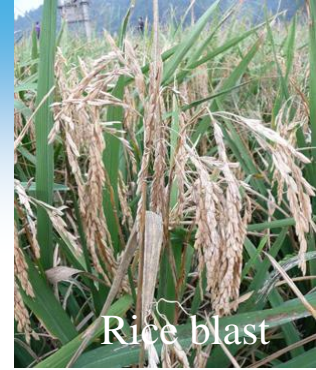
Biological Control

- ❖ **Biological Control to Insect Pests, Plant diseases and weeds**
- ❖ **Natural enemies mass feeding and release application**
- ❖ **Biopesticide developing , formulating and application**



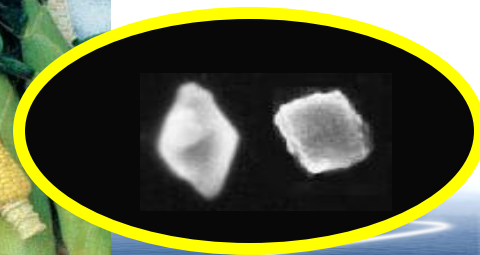
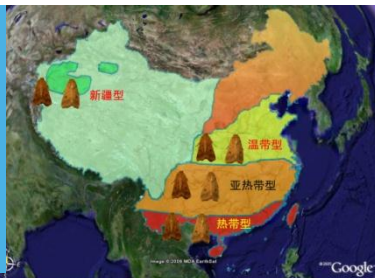
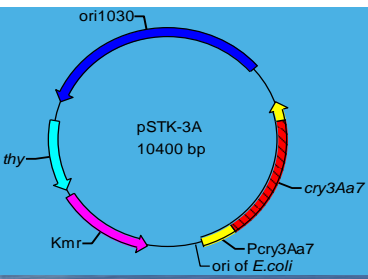
Functional Genome

- ❖ Bt novel gene cloning and functional genome
- ❖ Molecular mechanisms of *Magnaporthe oryzae* effector / rice blast resistant gene interaction
- ❖ Molecular mechanism of insect olfaction and insect functional genome



Biosafety of Agricultural GMOs

- ❖ Impacts of transgenic plants on pest evolution
- ❖ Management of target pest resistance to transgenic plants
- ❖ Impact of GMOs on diversity of agroecosystem



Bemisia tabaci



Bactrocera dorsalis



Invasive alien species

- ❖ **Biology, ecology of invasive alien species (IAS)**
- ❖ **Risk forecasting methods of IAS**
- ❖ **Control tactics of IAS**

Cydia pomonella



Eupatorium adenophorum



Ambrosia artemisiifolia



Alternanthera philoxeroides



Weed Science & Rodent management

- ❖ Weed biology, physiology & ecology, and behavior of rodents
- ❖ Integrated weed and rodent management
- ❖ Weeds/Rodent resistance to herbicide/rodenticide
- ❖ Mechanism of population outbreaks of rodent



Research Projects

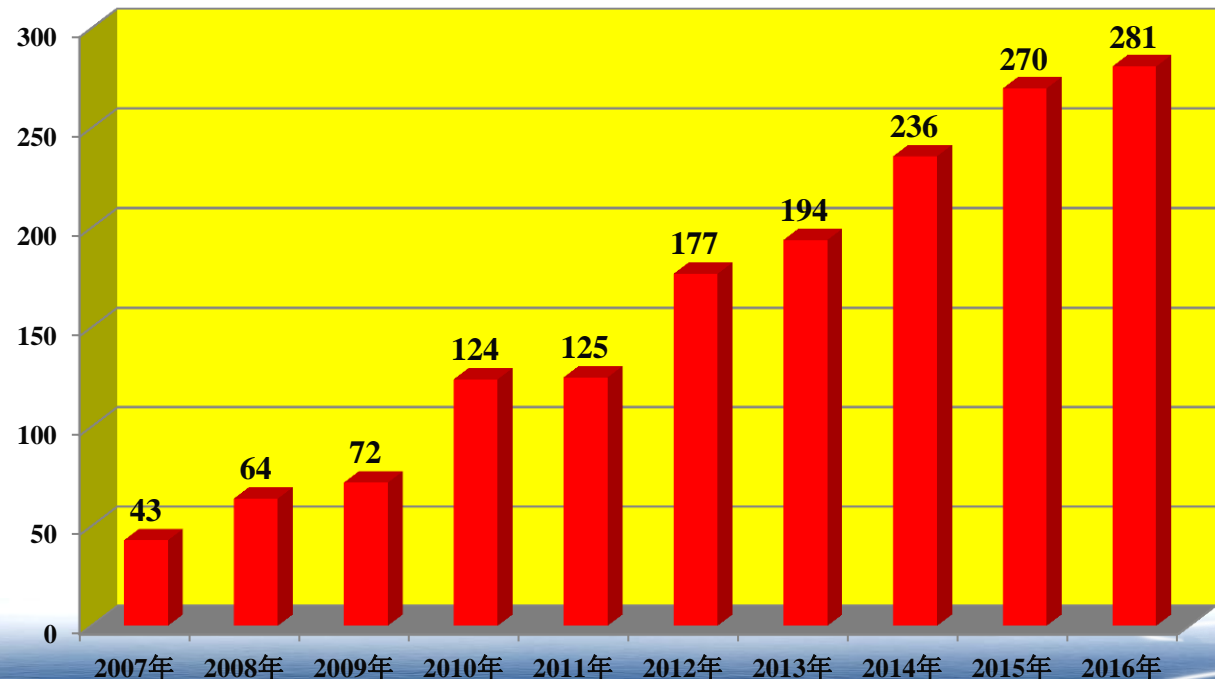
In recent five years, more than **410** national and international research projects are under implementation and the total budget in contract amounted to **1758 million Yuan RMB**

- ❖ National Basic R & D Program (973): 4 (14)
- ❖ National High-Tech R & D Plan (863): 13
- ❖ National S & T Supporting Plan: 15
- ❖ Natural Science Foundation of China (NSFC): 160
- ❖ GMO Research and Facility Projects : 25
- ❖ International Cooperation Projects: 110
- ❖ Others (Ministerial, Provincial, Company, etc.)

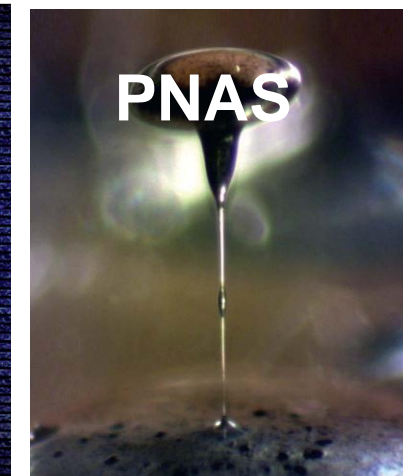
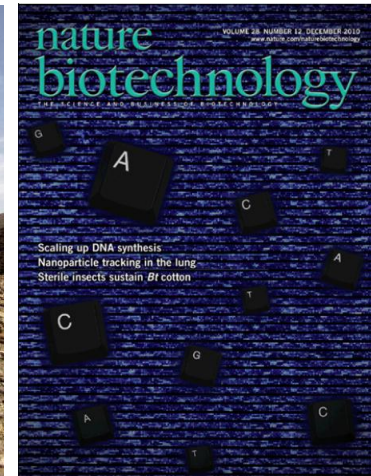
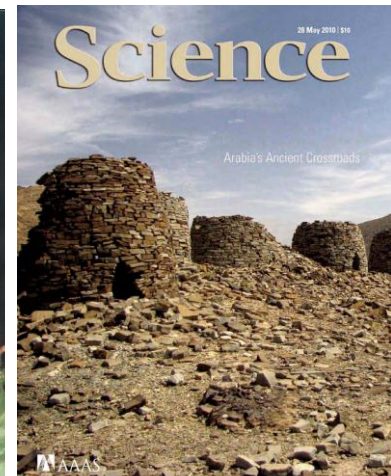
Publications and Awards (2010-)

- ❖ **Scientific Research Books: 101**
- ❖ **Scientific Research Papers: > 5400**
(SCI/EI: 633)
- ❖ **Awards: > 70**
- ❖ **Patents: 171**

SCI papers



➤ Research papers published in the international top-level journals has been increasing year by year, indicating that IPP has reached to the world-class in some research work



中国农业科学院
CHINESE ACADEMY OF AGRICULTURAL SCIENCES

2013年3月6日 星期四

您当前的位置： 首页 > 院所新闻 > 科研进展 > 正文

我科学家发现棉铃虫互利共生新病毒

文章来源： 中国农业科学院植物保护研究所 作者： 邵建飞 点击数： 1244 次 发布时间： 2013年3月6日

近日，从中国农业科学院植物保护研究所邵建飞、吴孔辉和研发团队和美国孟买斯特朗大学（Strang）和研发团队合作研究发现了两种对棉铃虫互利共生的病毒（M2和M3病毒），还可提高其对病毒的抗性水平，相关研究成果于2014年10月30日发表于国际著名期刊《病毒学》（*Virology*）上。



中国农业科学院
CHINESE ACADEMY OF AGRICULTURAL SCIENCES

2013年3月6日 星期四

您当前的位置： 首页 > 院所新闻 > 科研进展 > 正文

植保所王国梁团队揭示水稻与病原菌互作分子调控网络

文章来源： 中国农业科学院植物保护研究所 作者： 刘文杰 点击数： 1420 次 发布时间： 2013年3月6日

近日，中国农业科学院植物保护研究所“千人计划”学者王国防教授及其科研团队以“水稻抗病性”为题在植物病理学领域顶级期刊《植物病理学评论》（*Annual Review of Phytopathology*）发表了水稻与病原菌互作分子调控网络。



中国农业科学院
CHINESE ACADEMY OF AGRICULTURAL SCIENCES

2014年5月15日 星期四

您当前的位置： 首页 > 院所新闻 > 科研进展 > 正文

植保所科学家揭示病毒抑制RNA沉默新机制

文章来源： 中国农业科学院植物保护研究所 作者： 袁会珠 点击数： 1934 次 发布时间： 2014-04-04 【字体： 大 中 小】

近日，从中国农业科学院植物保护研究所袁会珠、周雪平研究团队与浙江大学农业与生物技术学院李正和研究团队在双生病毒与植物互作方面取得新的研究进展。他们利用遗传学和分子生物学等技术手段，以系统翔实的实验证据揭示了双生病毒编码的一个致病因子通过调控植物内源基因沉默抑制子抑制宿主防卫反应的新机制。

A	16c plants: 35S-GFP+				35S-GFP+			
	Vector	TRV	3 dpi	5 dpi	Vector	TRV	3 dpi	5 dpi
Vector								
pC1								
p19								

B	N. benthamiana: 35S-GFP+ 35S-GFP+				35S-GFP+			
	Vector	TRV	3 dpi	5 dpi	Vector	TRV	3 dpi	5 dpi
Vector								
pC1								
p19								

Research Platforms

❖ **National Key Laboratory for
Biology of Plant Diseases
and Insect Pests**

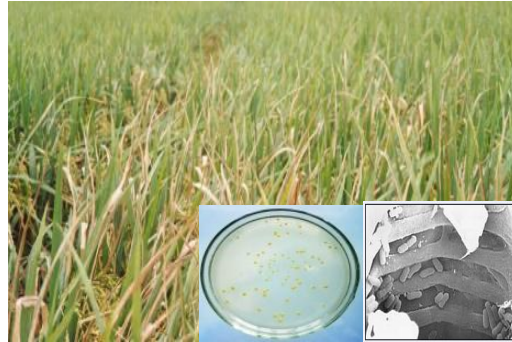


❖ **National Agricultural Bio-
Security Scientific Research
Center**

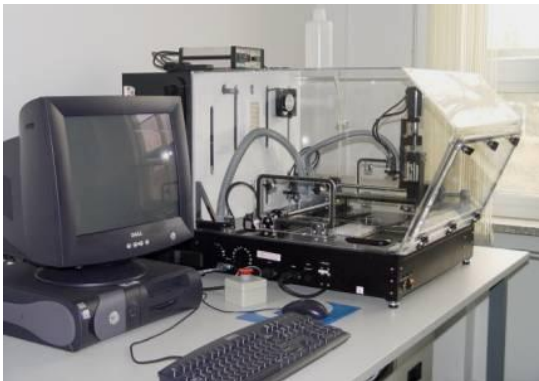


● Platform construction :

✓ Platform for Plant Pathology



Pathogen-plant Interaction



Transcriptomics



Genomics



Proteomics

✓ **Platform for Monitoring and Forecasting of Major Immigrant Insect pests**

“3S” Technology

Insect radar net



✓ Platform for Functional Genomics

Gene cloning

High-throughput gene screening and construction of gene

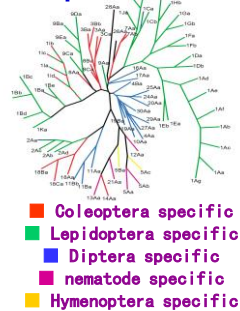


Gene function

Prediction of gene function and activity



Bioinformatic prediction



Gene expression and activity determination



Mechanism

Regulation of gene expression and interaction with



✓ Platform for invasive species and quarantine

Risk assessment

Data analysis



Invasive mechanism

Equipment for biological and molecular ecological research



❖ Field Experimental Stations (8)

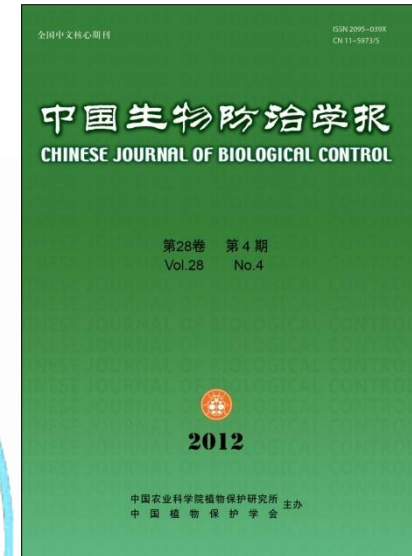
- Langfang (Hebei)
- Xinxiang (Henan)
- Xilinhaote (Inner Mongolia)
- Guilin (Guangxi)
- Tianshui (Gansu)
- Gongzhuling (Jilin)
- Korla (Xinjiang)
- Changdao (Shandong)



Affiliated Society and Journals



Nearly 20 thousands
members



International Cooperation and Exchanges



Partnership with 78 agricultural research agencies in 44 countries and international organizations

**Signing Ceremony of Memorandum of Understanding between
Institute of Plant Protection and Syngenta Biotechnology China**



Priorities for Collaboration

- ❖ **The 'Belt and Road' Plant Protection International Collaboration and Development Plan**
- ❖ **Regional monitoring and management of cross-border important pests**
- ❖ **Risk assessment and managements for GMO's and invasive alien species**
- ❖ **Introduction of agents for bio-control, and crop germplasms resistant to pests**
- ❖ **New IPM theories and techniques for different agro-ecosystems related to food safety and security**

International Cooperation Projects

More than 30 international cooperation projects (as lead applicant), the total budget over 135 million Yuan

✓ **2 EuropeAid funded projects**

EuropeAid funded GMSRice IPM project (1.984 million Euros)

EuropeAid funded GMSMaize IPM project (2.818 million Euros)

✓ **2 Horizon 2020 - Research and Innovation Framework Programme**

EU-CHINA“Mycokkey: Integrated and Innovative Key Actions for Mycotoxin Management in the Food and Feed Chain” 2016YFE0112900 (CN), 678781 (EU) (2016-2019, 4.51 million RMB)

China-EU Project for Virus Free of Fruit Nurseries ” 2017YFE0110900 (CN), 734736 (EU) (2018-2021, 4.04 million RMB)

✓ **10 Key Programs for International S&T Cooperation Projects of China**

□ The cooperation research projects

In the recent 5 years the international projects in **IPM** areas

Country/Area	Principal Investigator	Number
Belgium	Julian Chen, Xiufeng Yang	4
CABI (Switzerland)	Dewen Qiu	5
EU (Europeaid,FP7 Horizon 2020)	Maolin Hou, Zhenying Wang, Yongquan Zheng, Jie Feng, Shifang Li	5
Russia	Xingfu Jiang, Dewen Qiu	2
UK	Kongming Wu, Zehua Zhang,Xiangqun Nong	3
Israel	Fanghao Wan	1
USA	Kongming Wu,Jie Zhang, Dewen Qiu, Hongyin Chen	3
South Korea	Kecheng Zhang, Lisheng Zhang	2
Multi- Coutries	Hongyin Chen	1
Syngeta-China	Kanglai He,Guirong Wang	2
Czech Republic	Xifeng Wang	1
Norway	Deliang Peng	1
Unido	Aocheng Cao	1
The Netherlands	Wanquan Chen	1
Mexico	Deliang Peng, Shichang Xu	2
South-East	Dewen Qiu	1

LMCSF Project :



- ❖ The funding as 'pump-priming' to help in establishing the network among the Lancang-Mekong basin. Main activities as follows:
- ❖ A kicking off meeting in Beijing, China on May 14-16, 2018.
- ❖ visiting and technology training: 5 Chinese delegations having visited 5 countries, respectively, giving training courses for agricultural officials, experts and technicians in 5 countries during Aug -Sep, 2018. The technology trainings were successful and more than 1000 agricultural officials, experts and technicians from 5 countries attended and obtained certificates
- ❖ High-Level Forum of LMCSF Project in Beijing on November 19-22, 2018





International Research Platform

National Center for International Research

- ✓ Established in 2012 by Ministry of Science and Technology
- ✓ National Center for International Research of **Agricultural Bio-security**
- ✓ Evaluated to be excellent in 2017



MOA-CABI Joint Laboratory of Bio-safety

- Special funds from Chinese government annually
- Close collaboration with UK, Switzerland, Laos, Myanmar, etc
- 2 EuropeAid projects support by EU
- Jointly organized International Congress on Biological Invasions
- Dr. Ulrich Kuhlmann received “Chinese Government Friendship Award” in 2012

Established in 2008



International Congress on
Biological Invasions 2013



Going forward



- ❑ Establishment of the MARA China-CABI European Laboratory at CABI Switzerland Centre to help the Joint Lab achieve greater globalisation and innovative development

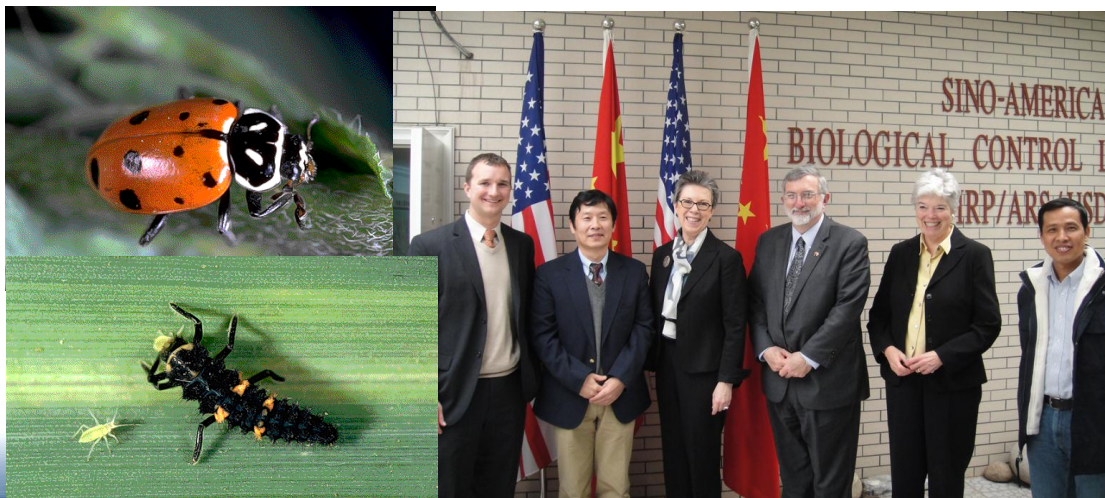


Sino-American Biological Control Laboratory

- ✓ Established in 1988 by CAAS and USDA-ARS
- ✓ Introduction and development of natural enemies **resources, novel techniques** for biological control of plant diseases, insect pests and weeds
- **Special funds from USA annually**



Vice minister of USDA, Cattie Woteki visited CAAS



CAAS delegations visited USDA-ARS

National Demonstration Base for Introducing Foreign Intelligence

Base for Biological Control of Locusts by *Metarhizium*



Station of Pest Investigation in
Rangeland (MOA)



Base for Production & Application Techniques of Microbial Pesticides

Introducing
foreign
techniques

Independently
developing
techniques

国家引进国外智力成果示范推广基地
无公害微生物农药生产应用技术
(2009.11 - 2014.10)
国家外国专家局



International Conference



The 1st International Biological Control Conference in 2018



International Congress on Biological Invasions in 2013



THE 'Belt and Road' Plant Protection International Consortium & Multi-lateral Collaboration Programme Development Consultation Workshop In 2015



The 3rd Beijing International Symposium on Molecular Plant Pathology 2017

THANK YOU

