

The background image is a scenic landscape at sunset. On the left, a large, modern building with a circular, ribbed facade stands on a small island or peninsula. The sun is low on the horizon, casting a warm orange glow across the sky and reflecting on the calm water of a lake. In the distance, there are silhouettes of mountains and some buildings. The overall atmosphere is serene and modern.

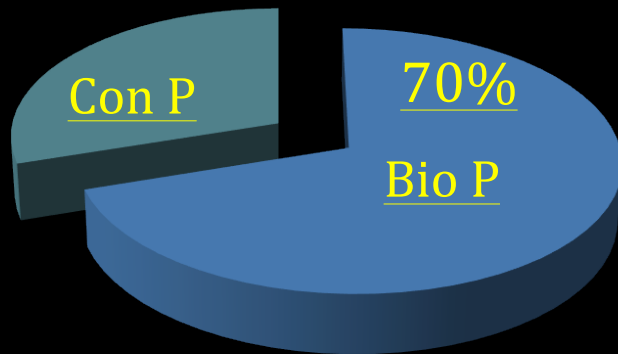
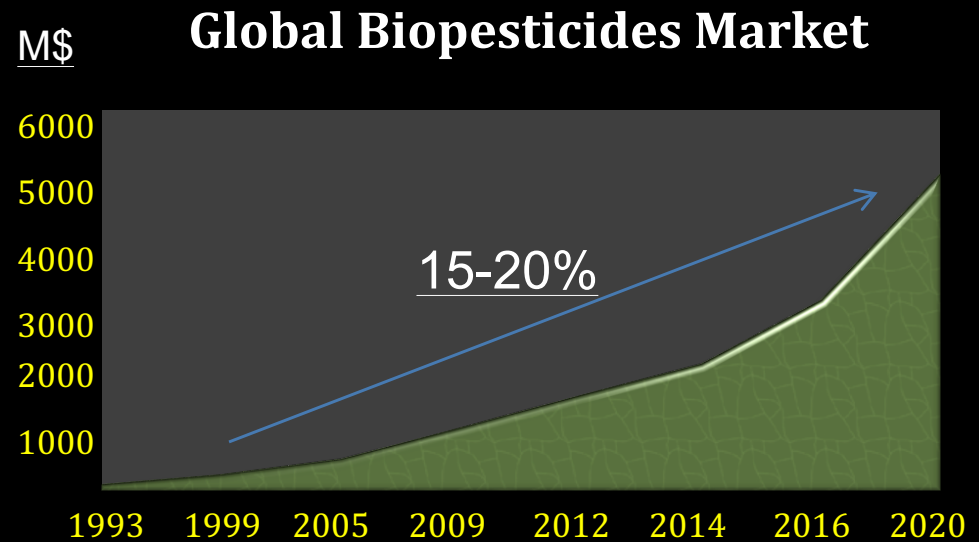
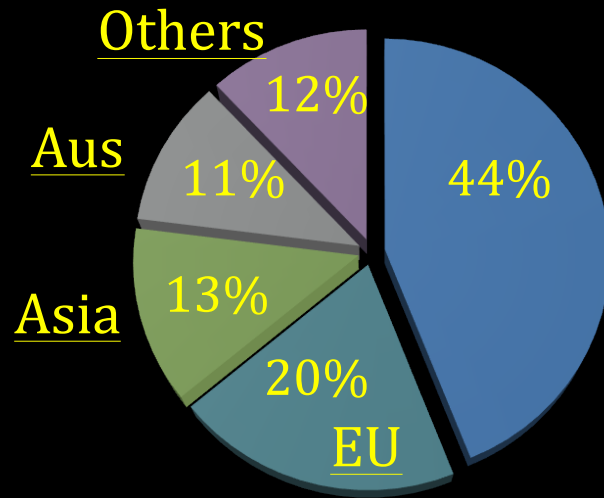
# The Biopesticides Market & Prospects in China

Antares , Mar 6th

# Content

1. World/China biopesticides history & current status
2. Comparison with EU/US biopesticides usage
3. Conventional pesticides misuse and hazards
4. China provisional policy for biopesticides
5. Biopesticides market prospect in China

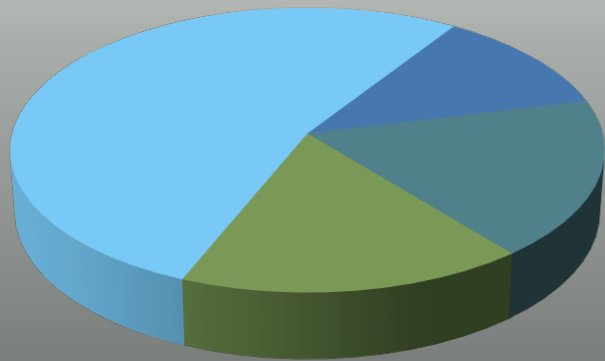
# Global Biopesticides Market



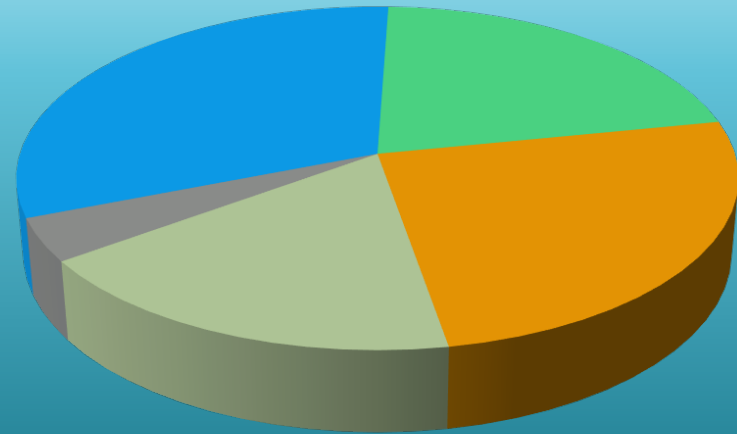
The global biopesticides is growing because of the low toxicity, have the ability to target specific organisms in an ecofriendly manner.

# Global Biopesticides market

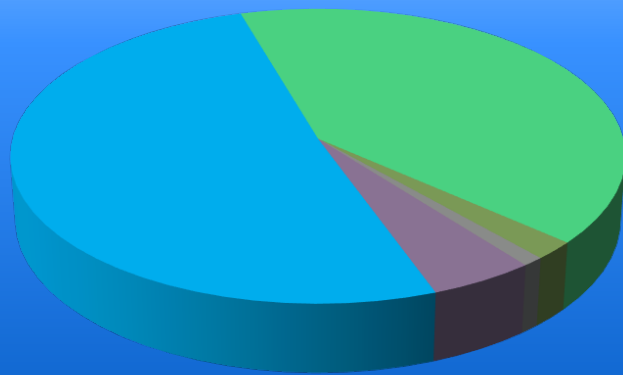
-by Classification, area, function, enterprise division



plant extracts      pheromones  
macroorganisms      microorganisms

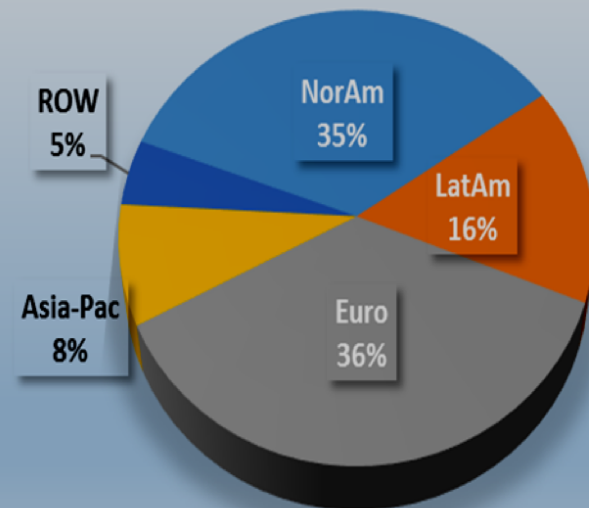


LAT AM    EU    ASIA/PAC    ROW    USA/CAN

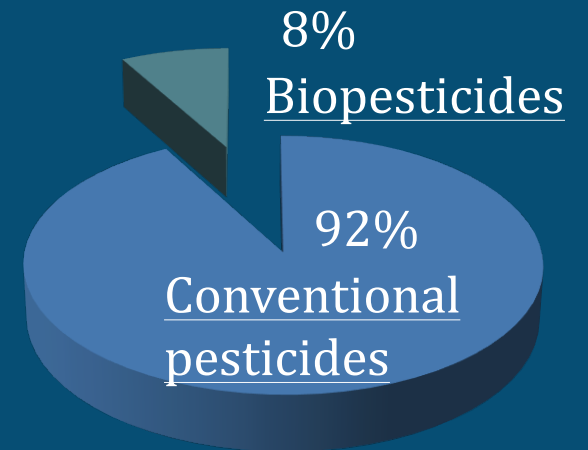
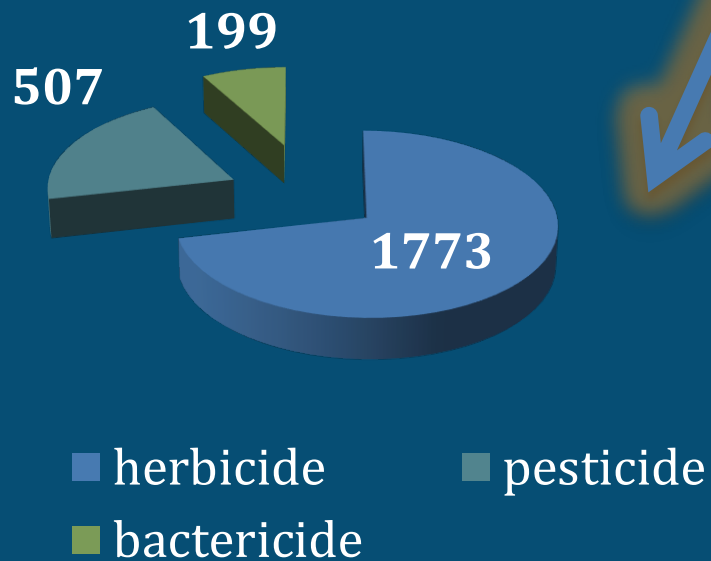
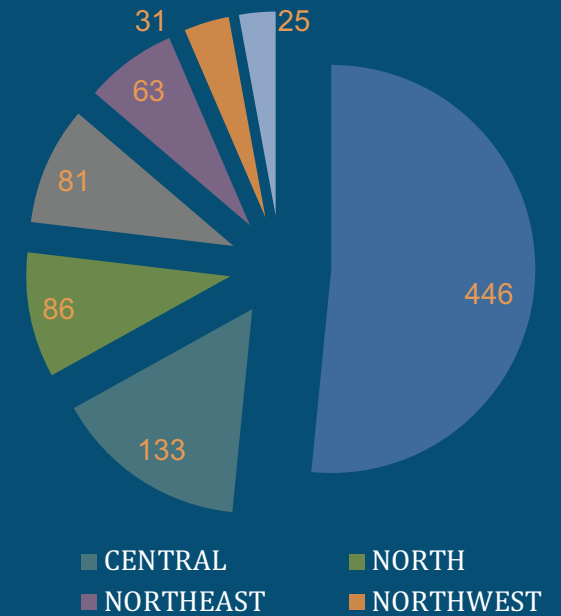
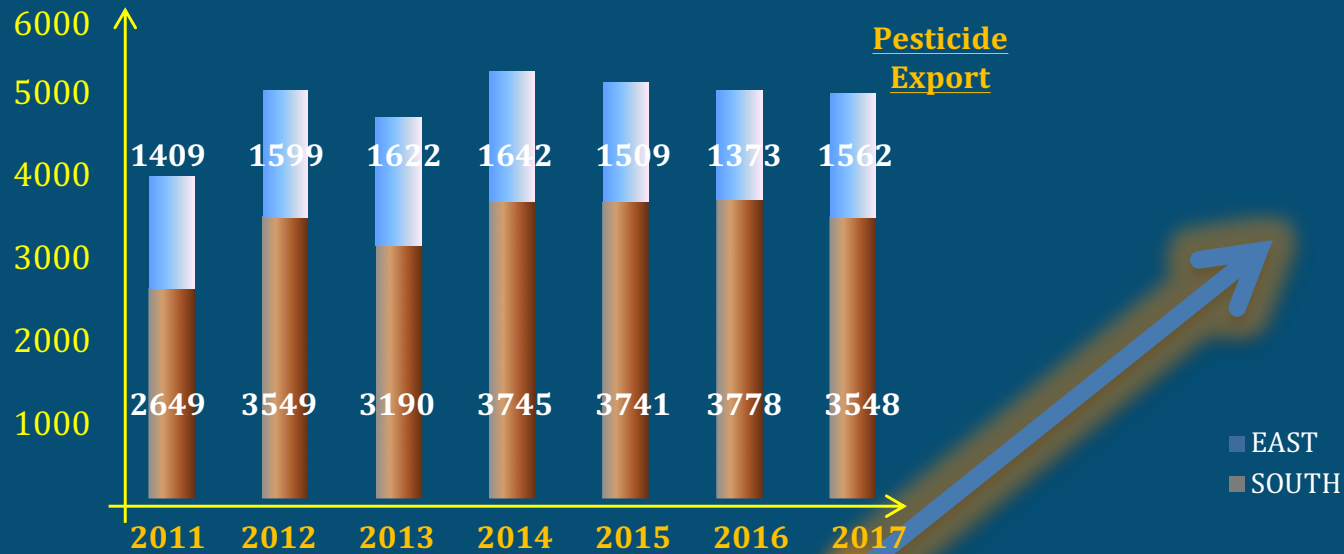


bioinsecticides    biofungicides    bionematicides  
bioherbicides    others

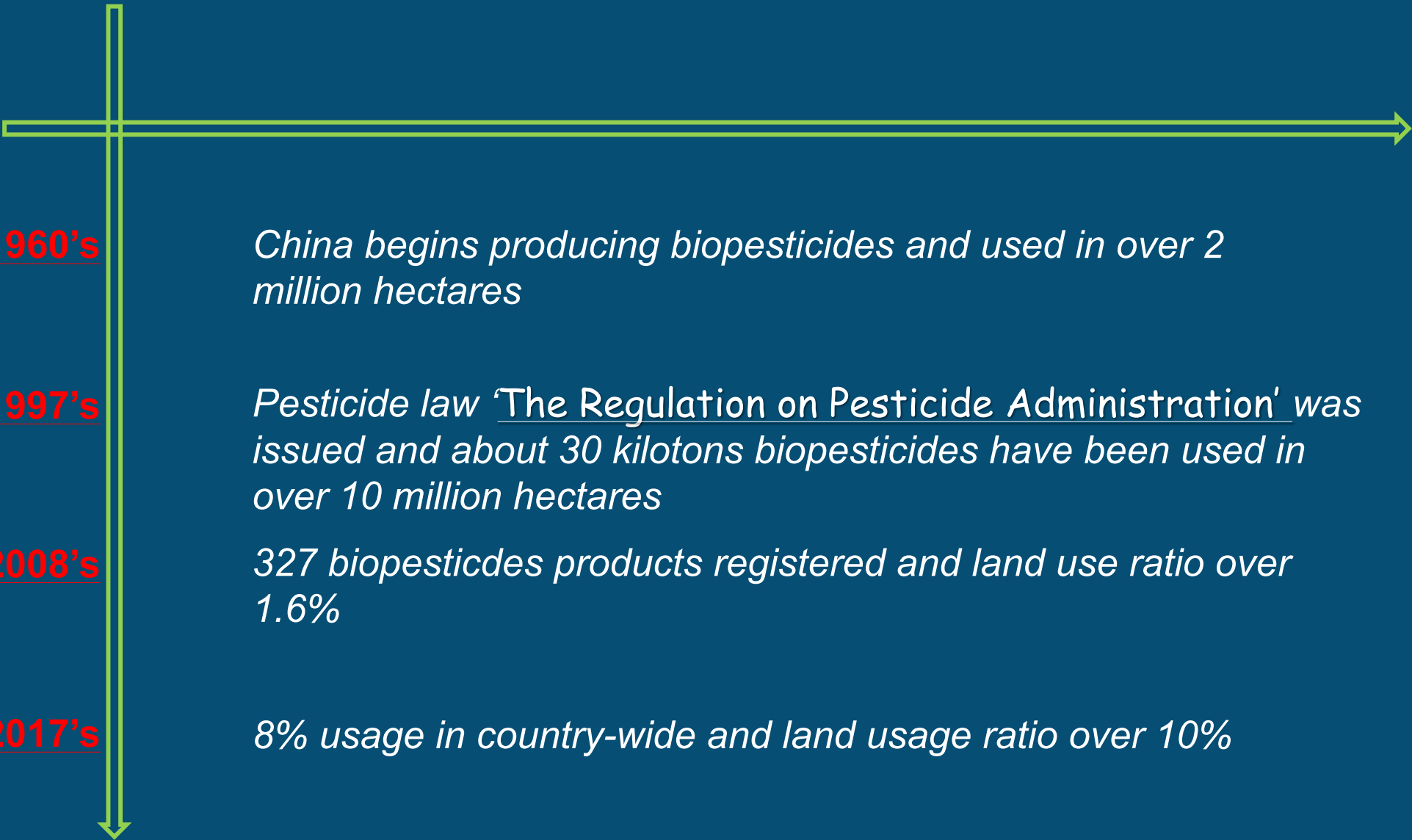
## Biopesticide Companies By Region



# China Biopesticides market



# China Biopesticides History



<b>1960's</b>	<i>China begins producing biopesticides and used in over 2 million hectares</i>
<b>1997's</b>	<i>Pesticide law '<u>The Regulation on Pesticide Administration</u>' was issued and about 30 kilotons biopesticides have been used in over 10 million hectares</i>
<b>2008's</b>	<i>327 biopesticides products registered and land use ratio over 1.6%</i>
<b>2017's</b>	<i>8% usage in country-wide and land usage ratio over 10%</i>

# China Biopesticides current status

- By 2017, China's pesticide production was 3.54Mtons, domestic consumption approximately 2M tons, biopesticides use up to 8% of biological control methods and farmland covers approximately 10% of all pesticide usage.
- The conventional pesticide China had used contaminated the soil, threatening both human and animal health. Due to low toxicity and ecological benefits, biopesticides have widely demanded, but are limited by R & D, disordered production, misuse from farmers, have lead to Chinese biopesticides utilization rates lower than EU and US.
- Low efficiency and high cost are also the reasons for low utilization.
- China's agricultural revitalization plan, rural land transfer system, ecological agriculture demonstration area, pesticide management system renewal, and a surge **Under Environmental Protection Demands** all lead toward opportunities for developing biopesticides in China.

# Under Environment Protection Demands

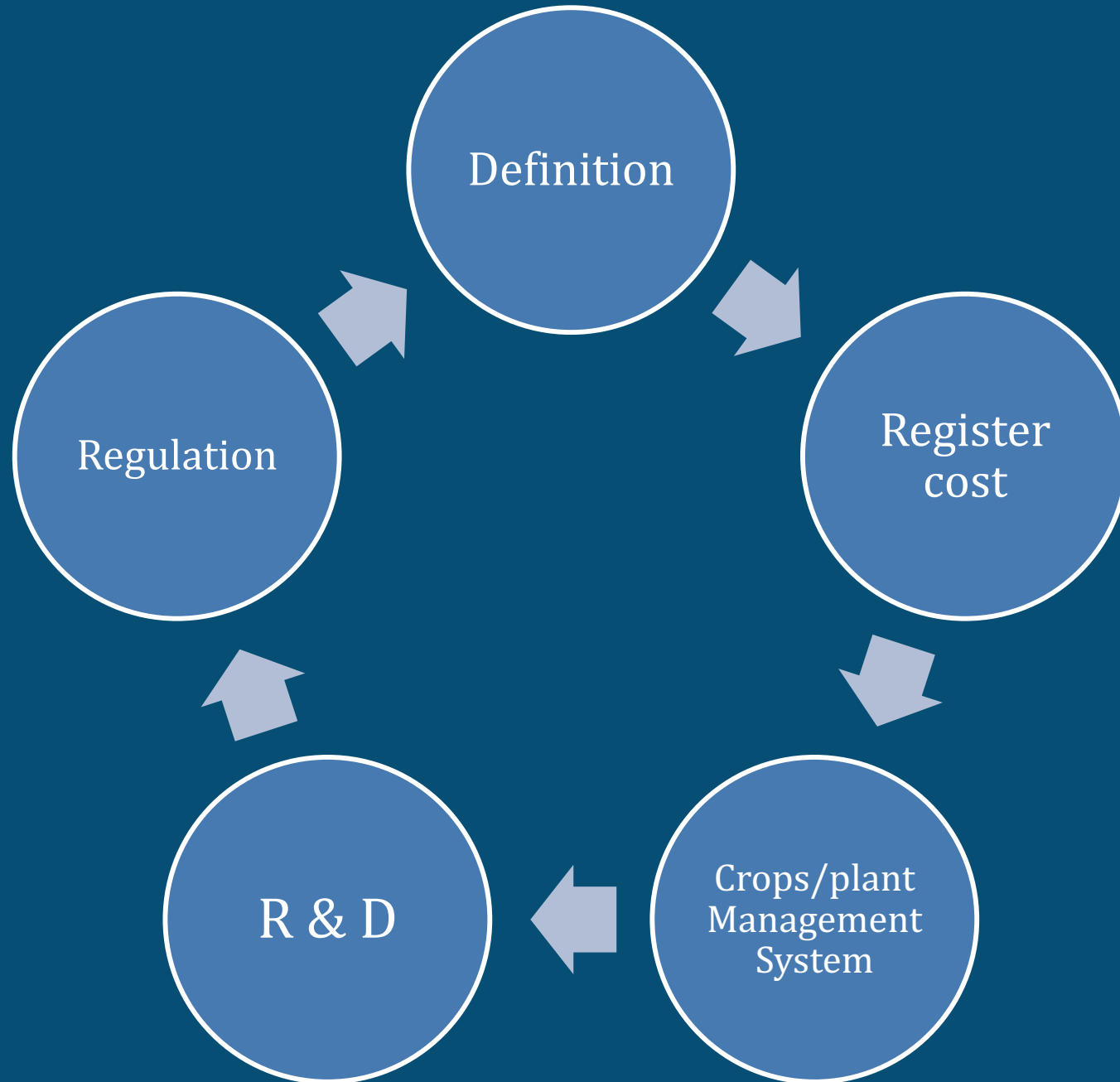
1. Production licensing, two-dimensional code tracking, permit, business license and other more difficult to obtain registration papers, 35 thousand pesticides and the homogenization in more than 20% products will not be registered, and approximately 60%\* of pesticide dealers will not be able to continue operation properly;
2. As a result of the massive shutdown of the raw material enterprises, the prices of pesticides products have risen sharply, which will continue and may promote the sale of biological pesticides.
3. The limited use and gradual withdrawal of high toxic pesticides, and the replacement of common pesticides will be pushed forward under the pressure of environmental protection.
4. With the Chinese government move to stimulate agricultural development alleviate poverty, the combination of science and technology with the growing interest of biopesticides has appeared and as a result has been promoted rapidly.



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# Compare with EU and US



# Comparison with EU/US biopesticides

## The main differences in the application of biological pesticides in EU ,US and China are

1. the population structure of cultivated land per capita due to the different biological pesticides can be extended in large area and cover a wider range of crops in Europe, and only cover few areas in China;
2. In China, there is no agricultural planning or long term low prices for major agricultural products causing individual farmers to pay more attention to profit and prefer to use low-cost quick chemical pesticides or highly toxic pesticides. Alternatively, large area planting which has the advantages of crop classification and market differentiation where agricultural practitioners in the EU use biological pesticides to obtain additional benefits of farming.
3. China is still lacking independent biopesticides regulations and independent registration standards, which leads to the high cost and long cycle of biological pesticides in China.

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# Misusage and hazards

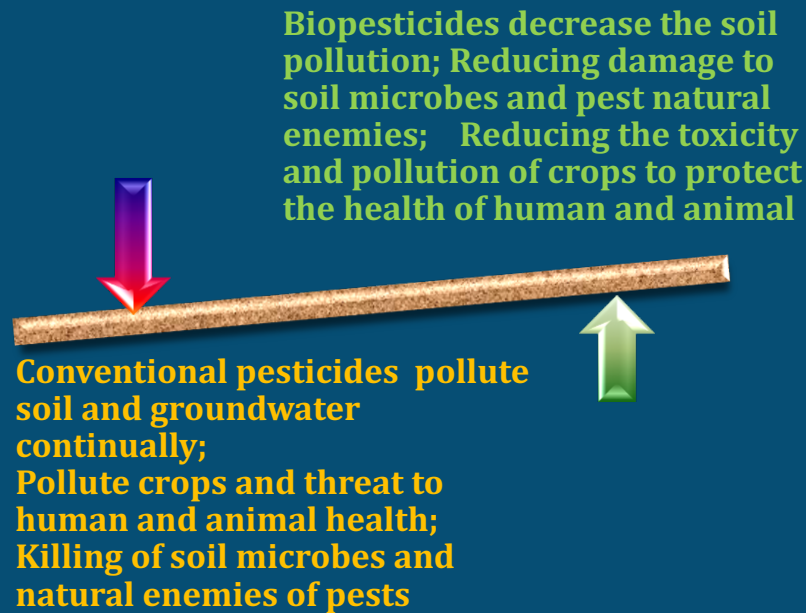
- ◆ The misuse of pesticides in China is a serious problem in China. The main reasons include:
  - ◆ Lack of proper training and education for farmers,
  - ◆ case study “1.Poisoned Scallion”;
- ◆ Lack of government oversight regarding marketable pesticides.
  - ◆ I.E. Organochlorine pesticide pollution, nitrate pollution, heavy metal pollution, organophosphorus pesticide pollution, pyrethrum lipids pesticide pollution...
  - ◆ case study “changzhou toxic land event”
- ◆ Lack of control over hazardous materials causing groundwater contamination, food contamination, and an increase in cancer cases.
  - ◆ Case study: “high incidences of cancer in China”

# Poisoned scallion

# Changzhou poisonland



# Conventional P and BioP



## Biopesticides

- **Highly selective**
- **Low toxicity**
- **More effective and long term control without resistance**

■ The standard of China's pesticide registration admittance falls behind the developed areas and leads to the high cost of advanced biological pesticide products or becomes inaccessible.

Case study. To understand why China government will push Biopesticides development.  
“Poisoned Scallion “ -26,000Kg polluted by high toxic pesticide Phorate led hundreds goats died  
‘Changzhou toxic land event’ caused more than 500 students to develop cancer

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# Provisional policy for Biopesticides

- 2013 Jan 6, the state council officially issued the Bioindustry development plan, to promote the industrialization of high quality plant immune inducer, biological fungicide or insecticide, natural enemies and other biological pesticide products.”
- 2015 Feb 17, “Action Plan for Zero Increase in pesticide use by 2020”
- 2017 June, China issued new “Regulation on pesticide management”
- In December 2017, the Ministry of Agriculture announced that the last 12 kinds of highly toxic pesticides would be banned in succession in five years. Endosulfan, Methyl bromide (2019); Aldicarb, Phorate, Optunal (2018); Ethoprophos, Omethoate, Methyl P, Liu heterogeneous, Aluminum phosphide (2020); Chloropicrin, Budweiser and Do-win (2022)

# HIGH TOXIC PESTICIDE EXIT TIMETABLE

2002	Fluoroacetamide	Gliflor	Tetramine	Sodium fluoroacetate	Silatranes
2003	Methamidophos	Methyl parathion	Parathion	Moncrotophos	Phosphamid on
2011	Terbufos,	Calcium phosphate	Magnesium phosphide casting	Fenamiphos	Fonofos
	Methyl sulfur ring P	Cadusafos	Coumaphos	Sulfotep	
2015	Methidathion				
2018	Aldicarb	Phorate	Optunal		
2019	Endosulfan	Methyl Brom			
2020	Ethoprophos	Omethoate	Liu p methyl isomers	AL Phosphide	
2022	Chlorpicrin	Budweiser	Dowin		



Highly  
toxic

toxic

medium

low

microtoxic

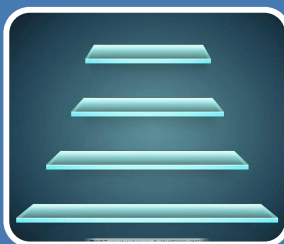
Non-toxic

After the “New Pesticide Management System in China” was implemented, the following events occurred:



Whole country over 30% pesticides producers will close

- Jiangxi 36
- Shandong 32



Higher threshold coming

- Prod permit, two-dimensional code tracking, emission permit, pesticide business certificate, cause companies to either shut down or upgrade their current technologies



New pesticides/biopesticides registration

- Jan 2018, 451 pesticides registered including 171 herbicides, 116 insecticides, 114 bactericides, bio product increased by 10%.

# 2018 –Agriculture Document No.1

1. Promote green development in rural areas and create a new pattern of harmonious development between man and nature.
2. Systematic management of mountain, river, forest, farmland, lake and grassland.
3. Strengthening the comprehensive management of the rural outstanding environmental problems.
4. Establishing a market oriented and diversified ecological compensation mechanism.
5. Increase the supply of agricultural ecological products and services.

# -China rural development mode Upgrade



- Governance Mountain, river, forest, farmland, lake, grassland

- Diversified, ecological, market-oriented-compensation mechanism

- Increase ecological products and service

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# China biopesticides market Aspirations

- Biological pesticides will be developed rapidly from the promotion of China Biocontrol targets.
- Usage on minor crops such as **Fruit**, **Tea** and **Vegetables** will be important potential market for biopesticides.
- **Ecological Agricultural Demonstration Counties** will become the main development sites for biopesticides.
- **Toxic Pesticide Exit** will provide wide market space for biopesticides (e.g. Beijing, Sichuan and Guizhou)
- New biopesticides regulations and green channels will shorten biopesticides entry and reduce the biopesticide registration cost which will lead to competition between companies for the next product.

# Challenge and Opportunities

1. Chinese technology development and industrial promotion ability for biopesticides is limited, which requires continuous funding technology in addition to local scientific research institutions with leading enterprises into joint multinational enterprises whom also need to crop research and development and industrialization of new technologies and new products;
2. Subject to the zero growth requirement of pesticide consumption in China, bio pesticides must be suitable products replacements as opposed to existing chemical pesticides and highly toxic pesticides that will fall out of the market.
3. Highly integrated management of plant protections for pesticide crops, China's biological pesticides must cooperate closely with crops and plant protection enterprises.
4. The promotion of biological pesticides will benefit from the environmental protection and remediation of soil and water resources, which are now being vigorously carried out in China.



# Thanks

- ◆ Further discussion, please contact Email [antares.w.gang@outlook.com](mailto:antares.w.gang@outlook.com) or Tel +8613911029134