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硕士学位论文

论中国对杀虫剂的法律管理

On China's Legal Regulations of Pesticides

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Appendix 2: Declaration of thesis originality

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Declaration of Authorship

I strongly hold my opinion for the fact that counterfeit pesticides in China are a serious environmental concern. People who are still considering it as a myth should take a look at its dangerous impact. If it was a myth, then why the concentration of chemicals in food products and water sources increased? Why are more and more people experiencing health problems? Why does an excess of fake and illegal products hurt China's reputation and economy? From these evidences, and many more, the entire world has accepted that counterfeit pesticides in China are actually taking place and government is taking strong action to control it and save our lovely planet Earth.

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I offer my regards and blessings to all of those who supported me in any respect during the beginning and the completion of my degree at Xiamen University. I would like to heartily thank Xiamen University for their scholarship and generosity, professors at Xiamen University for their expertise, and the Xiamen University Library for its resources.

Lastly, I would like to dedicate this book to my mother, Rebecca Fitz. Thank you for always inspiring me to be a strong and well-educated woman.

Laura Fitz

Abstract

China's farmers overuse pesticides, skip protective clothing and have at their fingertips an array of banned and counterfeit products, raising another area of concern in the country's food chain. Spraying chemicals on crops improperly or using products that may be fake or banned risks the health of China's hundreds of millions of farmers and could lead to unsafe levels of residues in fruits and vegetables. The government has to stop banned or illegal pesticides being available in the market. China has banned five high toxicity pesticides as of January 1, but some of the old stock was still in the market, in the hands of traders, retailers and farmers themselves. The government has pledged to step up inspections on its Pesticides Administration in its food industry, saying checks on fertilisers and pesticides would be one of the priority areas. Evidence suggests that China's farmers also routinely misuse pesticides and fail to protect themselves. Has China created misguided policies?

Some experts say that recent government policies that lower the price of pesticides are also misguided. Many governments feel that they're doing the farmers a favour by promoting policies that create lower prices for these products. The unintended consequence of that is that the farmers don't have a reason to use them properly. Not only are banned substances available, but there is an estimation that some 20 percent of the pesticides sold in China are fakes. China has had a reputation for creating good counterfeit items. Sometimes it's very difficult for a farmer to know that he's buying a counterfeit product.

Counterfeiters are good at packaging and labels and there are some cases where the counterfeiting has a certain amount of protection from the local authorities. All agree that China needs to implement a comprehensive system to clean-up the sector. For pesticides, the Ministry of Agriculture monitors field use, the state planner and the Commerce Ministry grant production licences, the Ministry of Health is responsible for setting maximum residue levels, and the State Environmental Protection Administration monitors environmental impacts. Nevertheless, you have to work on the manufacturing process, you have to work on educating the farmers, you need legislation in place to regulate accessibility to pesticides, and then of course you have to have monitoring programmes in place.

Key Words: Legal Regulation; Pesticides; Health & Environment Protection;

厦门大学博硕士学位论文摘要库

摘要

中国农民过度使用农药，违背法律法规，使用禁止和假冒伪劣产品，引起人们对食品安全问题这一领域的关注。喷洒在农作物上的化学品不当使用或者使用禁止及假冒伪劣产品威胁数百万农民的健康，并可能导致水果蔬菜残留不安全因素上升。政府应禁止非法农药产品在市场上的销售。截至1月1日起，中国已禁止五种高毒农药的销售，但仍有明令禁止的农药在市场上，经销商，零售商和农民中流通。政府已承诺在食品行业加强其农药管理的检查，将检测化肥使用和农药喷洒作为工作重中之重。但仍有证据表明，中国的农民仍滥用杀虫剂，没有正确使用防护措施。难道中国政府实施了错误的政策？

一些专家认为，政府降低农药的价格，其实是一个误导。一些政府认为，农药产品低价格的政策，造福于农民。意想不到的后果是，农民们并没有得益于此。不仅是被禁止的农药在市场上流通，而且有统计称，在中国销售的农药中约有20%是假货。中国素有造假大国之称，农民们很难辨别他买到了是否是假冒产品。

造假者在包装和标签造假上很有一套，更有地方政府保护做掩护。大家都认同，中国需要更透明的政府公开政策。对于农药这一问题，农业部监管土地使用，商务部来规范生产许可，卫生部负责制定最大残留限量，国家环保总局监测环境的影响。总而言之，制造业的持续发展，需加大对农民教育的工作，需立法规范农药的生产销售，然后当然必须有到位的监测方案。

关键词：法律管理；杀虫剂；健康和环境保护

Abbreviations

1. Administration for Quality Supervision, Inspection and Quarantine (AQSIQ)
2. American Conference of Governmental Industrial Hygienists (ACGIH).
3. California Department of Pesticide Regulation(DPR)
4. California Environmental Protection Agency (CEPA)
5. China Environment and Sustainable Development Reference and Research Center (CESDRRC)
6. China's State Food and Drug Administration (SFDA)
7. Codex Alimentarius Commission (CAC)
8. County Agricultural Commission (CAC).
9. Department of Transportation (DOT)
10. Emergency Planning and Community Right-to-know Act (EPCRA)
11. Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA")
12. Hazardous Materials Regulations (HMR)
13. Institute for the Control of Agrochemicals of the Ministry of Agriculture (ICAMA)
14. Institutes for Control of Agrochemicals (ICA).
15. International Agency for Research on Cancer (IARC).
16. Material Safety Data Sheet (MSDSs).
17. Maximum residue limit (MRL)
18. Ministry of Agriculture (MOA)
19. Ministry of Health (MOH)
20. National Development and Reform Commission (NDRC)
21. National Toxicology Program (NTP)
22. nongovernmental organization (NGO)
23. OSHA's Hazard Communication Standard (HCS)
24. Pesticide Eco-Alternatives Center (PEAC)
25. Pesticide Environment Stewardship Program (PESP)
26. Pesticide Registration Improvement Renewal Act Partnership (PRIA2)
27. Restricted Use Products (RUP)
28. State Environmental Protection Agency (SEPA)

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Chapter One Introduction

"A healthy environment, prosperous economies, and vibrant communities founded on the rule of law" -- ELI (environment Law institute).The protection of human health and the environment from the adverse effects of pesticides is both a scientific and a regulatory endeavor around the world. Pesticides have assisted farmer to maximize plant and husbandry yields and minimize disease and pest destruction. The pesticide industry is multi-billion dollar commerce and has become a necessity in the food trade. Because of the crucial need of safe and disease free food, every country around the world uses and applies some sort of pesticide in order to enhance food production. Other counties use larger volumes than other countries, especially that have large land mass and huge populations like the United States, China, and India. The United States is the number one player in regards to pesticide creations and use of pesticides while China and India are following closely behind the United States. With the global concept that everyone needs to eat safe and creditable foods, scientists and government officials are tasked with generating robust toxicological data about legal regulators to regulate the effects and originality of these pesticides.

China has implemented an Insecticides Act which regulates the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals and matters connected therewith.¹This act was created as a measure to check food poisoning, pollution harm, and environmental damages. While China's law is continuing to evolve, it continues to seek ways to improve its pesticides program.

Most often, pesticides generate such large revenues that often countries are left with the dilemma of misguided and illegally created pesticides that neither meet the government standards of public safety and or controlled amounts of hazardous chemical induced compounds that affect the environment. Many participants living in both developed or developing countries have breached Intellectual Property Laws by creating fake and misguided products that have become a serious danger to all living forms including damages to animals, air, water, and the environment. Although countries vary from legal standards to controlling the flow of dangerous products, China, European Union, India and the United States have all breached Intellectual Property Rights at certain levels when it comes to presenting and selling pesticides.

1.1 Definition of Pesticides

Pesticides are substances or combinations of substances intended for preventing, destroying, repelling or extenuating any pest. A pesticide may be a chemical, biological agent such as a virus, germ or bacterium, antimicrobial, decontaminator or device used against any pest. Pests include insects, plant pathogens, weeds, molluscs, birds, mammals, fish, roundworms, and microbes that destroy property, spread disease or are transmittor for disease or cause problems. Although there

¹ Engler, R. "EPA Pesticides Regulation." *Science* 192.4237 (1976): 300-18. Print.

are benefits to the use of pesticides, some also have negative aspects, such as potential toxicity to humans and other animals. According to the Stockholm Convention on Persistent Organic Pollutants, 9 of the 12 most dangerous and persistent organic chemicals are pesticides. Pesticides are categorized into four main substituent chemicals: herbicides; fungicides; insecticides and bactericides (Figure 1).²

Figure 1: Types Pesticides and Target Pests

Type of Pesticide	Target Pest Group
Herbicides	weeds and other harmful plants
Insecticides	insects such as termites and moths
Nematicides	roundworms
Fungicides	fungi
Rodenticides	mice, rats, and other rodents

Food and Agriculture Organization (FAO) has defined the term of pesticide as:

*any substance or mixture of substances intended for preventing, destroying or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs, or substances which may be administered to animals for the control of insects, arachnids or other pests in or on their bodies. The term includes substances intended for use as a plant growth regulator, defoliant, desiccant or agent for thinning fruit or preventing the premature fall of fruit. Also used as substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.*³

1.2 Health effects

² "National Pesticide Information Center - Home Page." *National Pesticide Information Center*. Web. Mar.-Apr. 2012.

<http://www.npic.orst.edu/>.

³ EPA. Environmental Protection Agency. Web. Mar.-Apr. 2012.http://www.epa.gov/ogc/china/initiative_home.htm.

Pesticides may cause acute and delayed health effects in those who are exposed. Pesticide exposure can cause a variety of adverse health effects. These effects can range from simple irritation of the skin and eyes to more severe effects such as affecting the nervous system, mimicking hormones causing reproductive problems, and also causing cancer. A 2007 systematic review found that "most studies on non-Hodgkin lymphoma and leukemia showed positive associations with pesticide exposure" and thus concluded that cosmetic use of pesticides should be decreased. Strong evidence also exists for other negative outcomes from pesticide exposure including neurological, birth defects, fetal death, and neurodevelopment disorder.

The American Medical Association recommends limiting exposure to pesticides and using safer alternatives: "Particular uncertainty exists regarding the long-term effects of low-dose pesticide exposures. Current surveillance systems are inadequate to characterize potential exposure problems related either to pesticide usage or pesticide-related illnesses... Considering these data gaps, it is prudent...to limit pesticide exposures...and to use the least toxic chemical pesticide or non-chemical alternative."⁴

The World Health Organization and the UN Environment Program estimate that each year, 3 million workers in agriculture in the developing world experience severe poisoning from pesticides, about 18,000 of whom die. According to one study, as many as 25 million workers in developing countries may suffer mild pesticide poisoning yearly.⁵

One study found pesticide self-poisoning the method of choice in one third of suicides worldwide, and recommended, among other things, more restrictions on the types of pesticides that are most harmful to humans.

1.3 Pesticide Poisoning

A pesticide poisoning occurs when chemicals intended to control a pest affect non-target organisms such as humans, wildlife, and environment. There are three types of pesticide poisoning. The first of the three is a single and short-term very high-level of exposure which can be experienced by individuals who commit suicide, as well as pesticide formulators. The second type of poisoning is long-term high-level exposure and has the possibility of effecting pesticide

⁴ Gips, Terry. *Breaking the Pesticide Habit: Alternatives to 12 Hazardous Pesticides*. Penang, Malaysia: International Organization of Consumers Unions, 1990. Print.

⁵ *Beyond Delaney: Preventing Exposure to Hazardous Pesticides*. Washington, D.C.: Physicians for Social Responsibility, 1995. Print.

formulators and manufacturers. The third type of poisoning is a long-term low-level exposure which individuals are exposed to from sources such as pesticide residues in food as well as contact with pesticide residues in the air, water, soil, sediment, food materials, plants and animals.

In developing countries, such as China, pesticide poisonings from short-term very high-level of exposure (acute poisoning) is the most worrisome type of poisoning. However in developed countries, such as Canada, it is the complete opposite and acute pesticide poisoning is controlled making the main issue long-term low-level exposure of pesticides

The most common exposure scenarios for pesticide-poisoning cases are accidental or suicidal poisonings, occupational exposure, by-stander exposure to off-target drift, and the general public who are exposed through environmental contamination.

Self-poisoning with agricultural pesticides represents a major hidden public health problem accounting for approximately one-third of all suicides worldwide. It is one of the most common forms of self-injury in the Global South. The World Health Organization estimates that 300,000 people die from self-harm each year in the Asia-Pacific region alone. Most cases of intentional pesticide poisoning appear to be impulsive acts undertaken during stressful events, and the availability of pesticides strongly influences the incidence of self poisoning ⁶

Pesticide poisoning is an important occupational health issue because pesticides are used in a large number of industries, which puts many different categories of workers at risk. Extensive use puts agricultural workers in particular at increased risk for pesticide illnesses. Workers in other industries are at risk for exposure as well. For example, commercial availability of pesticides in stores puts retail workers at risk for exposure and illness when they handle pesticide products. The ubiquity of pesticides puts emergency responders such as fire-fighters and police officers at risk, because they are often the first responders to emergency events and may be unaware of the presence of a poisoning hazard. The process of aircraft disinfection, in which pesticides are used on inbound international flights for insect and disease control, can also make flight attendants sick.

Different job functions can lead to different levels of exposure. Most occupational exposures are caused by absorption through exposed skin such as the face, hands, forearms, neck, and chest. This exposure is sometimes enhanced by inhalation in settings including spraying operations in greenhouses and other closed environments, tractor cabs, and the operation of rotary fan mist sprayers ⁷

When thinking of pesticide poisoning, one does not take into consideration the contribution that is made of their own household. The majority of households in Canada use pesticides while

⁶ "OSHA Updates Chemical Hazard Information." *Courthouse News Service*. 29 Mar. 2012. Web. Mar.-Apr. 2012.

<http://www.courthousenews.com/2012/03/28/45132.htm>.

⁷ "EPA Publishes Human Health Benchmarks for Pesticides in Water." *ENews Park Forest*. 18 Apr. 2012. Web. Mar.-Apr. 2012.

taking part in activities such as gardening. In Canada 96 percent of households report having a lawn or a garden, and 56 percent of the households who have a lawn or a garden utilize fertilizer or pesticide. This form of pesticide use would contribute to the third type of poisoning, which is caused by long-term low-level exposure. As mentioned before, long-term low-level exposure effect individuals from sources such as pesticide residues in food as well as contact with pesticide residues in the air, water, soil, sediment, food materials, plants and animals.

Pesticides are poisonous chemicals. Every pesticides' toxicity (how poisonous the chemical is to the pest) varies according to important factors such as the species, age, sex physical and nutritional state of the organism that comes into contact with the pesticide. Toxicity of a pesticide also depends on the type and the formulation of the poison, even the time of day or year that it is used The World Health Organization estimates that at pesticides every year and more than 200,000 die.⁸

It is estimated that up to 25 million agricultural workers are poisoned every year. Most of these take place in Africa, Asia and South America and often go unrecorded. The poisoning rate is high because pesticides can enter the human body through the skin, the lungs, the mouth and the eyes. How dangerous a pesticide is depends on how much you come into contact with, how toxic the pesticide is and how it entered your body. Some pesticides are deadly when absorbed through the skin, others are more deadly when inhaled or eaten. How a person is poisoned depends upon how they usually come into contact with the pesticide:

Widespread doubts emerged about whether "safe use" of highly hazardous pesticides was possible in developing countries. The term was dropped from the 2002 revision of the *International Code of Conduct on the Distribution and Use of Pesticides*. The revised Code began to address the importance of reducing and eliminating pesticide hazards. It recognized that major weaknesses of pesticide management still existed, stating that: "*there are still major weaknesses in certain aspects of pesticide management, predominantly in developing countries. For instance, national pesticide legislation is not widely enforced due to lack of technical expertise and resources, highly hazardous or sub-standard pesticide formulations are still widely sold; and end-users are often insufficiently trained and protected to ensure that pesticides can be handled with minimum risk.*"

Across the globe, pesticide poisoning is a massive issue. In Malaysia and Sri Lanka, 7 to 15 percent of farmers experience poisoning at least once in their lives. In Thailand, a survey of 250 government hospitals and health centre revealed that some 5,500 people were admitted for pesticide poisoning in 1985 alone, of whom 384 died. In China, 42,800 new cases of pesticide

⁸ Lodgejr, J. "Pesticide Fact Handbook, U.S. Environmental Protection Agency, Noyes Data Corporation, New Jersey
Atmospheric Environment (1967) 23.4 (1989): 44-59. Print.

poisoning were reported in 1994, including 3,900 fatalities . Many were said to be victims of home-made concoctions market illegally.⁹

⁹ "China Daily." *Experts Reveal Content of Pesticide Residues in Fruits and Vegetables and Remove Methods*. Web. Mar.-Apr. 2012. <http://www.china-daily.org/China-News/Experts-reveal-content-of-pesticide-residues-in-fruits-and-vegetables-and-remove-methods>.

Chapter Two Downfalls in China's Pesticide Regulations

2.1 Pesticide Regulations in China

In China, pesticide poisoning are regulated by various state, federal and international agencies that balance the costs and benefits of pesticides to society. They try to identify the potential risks on human health and the environment, determine how much exposure may occur, and create tailored risk mitigation measures to minimize risks. At the Federal and state levels, regulators use pesticide product labeling to communicate rules and regulations, including requirements to protect workers, children, wildlife and the environment.

Federal agencies typically set the primary regulations for pesticide poisoning, then state and local agencies may add additional regulations. Federal agencies work cooperatively with state agencies to register pesticides, license and educate applicators and investigate pesticide problems. China is the world's biggest user, producer, and exporter of pesticides and the jurisdiction has amended regulations on its Pesticide Administration.

Drivers of the Problem China has nearly one-fifth of the world population, but only seven percent of the world's arable land. In order to meet the food requirements of its large population, increasing food production has long been the priority of the Chinese government. Starting in the 1980s, agricultural outreach offices under local governments began a strong push to promote the use of chemical fertilizers and pesticides as a means to increase yields. These offices were rewarded for promoting sales of fertilizers, which catalyzed the rapid decrease in the use of human and animal wastes on crops. Many Chinese farmers over apply pesticides and fertilizers to get greater yields, in part because they fear some are actually fake which became a common problem in China. Farmers thus need more pesticide information and user education to help them use pesticides and other farm chemicals properly.

Environmental Problems from Pesticide Overuse Official statistics indicate that about seven percent of China's cropland has been polluted due to improper use of pesticides and fertilizers. This growing pesticide contamination is exacerbating the loss of agricultural land in China, which is also degraded due to salinization, desertification and erosion, as well as heavy metal and radioactive pollution.

Agricultural runoff is also becoming a major pollutant of rivers and coastal areas. For example, according to a 2004 China marine environment report, about 2,480,000 tons pesticide and fertilizer flow into the Zhu River every year, which has seriously polluted river and coastal waters in Guangdong Province. The use of high-toxicity pesticides also is killing beneficial insects, causing many pest disasters in China. For example, in 2001 over one million hectares of cotton fields in Xinjiang were attacked by aphids and spider mites, causing an \$85 million loss.

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¹⁰ Wilson, John H. *North Carolina Pesticide Laws and Regulations*. [Raleigh, N.C.]: N.C. Dept. of Agriculture and N.C.

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