

# Impacts of Pesticides

PROKCHOL OUSAP

Thailand Pesticide Alert Network



**Thai-PAN**

Thailand Pesticide Alert Network

เครือข่ายเตือนภัยสารเคมีกำจัดศัตรูพืช



BIOTHA

BIODIVERSITY  
SUSTAINABLE AGRICULTURE  
FOOD SOVEREIGNTY  
ACTION  
THAILAND

# Value chain of the global food and agriculture system

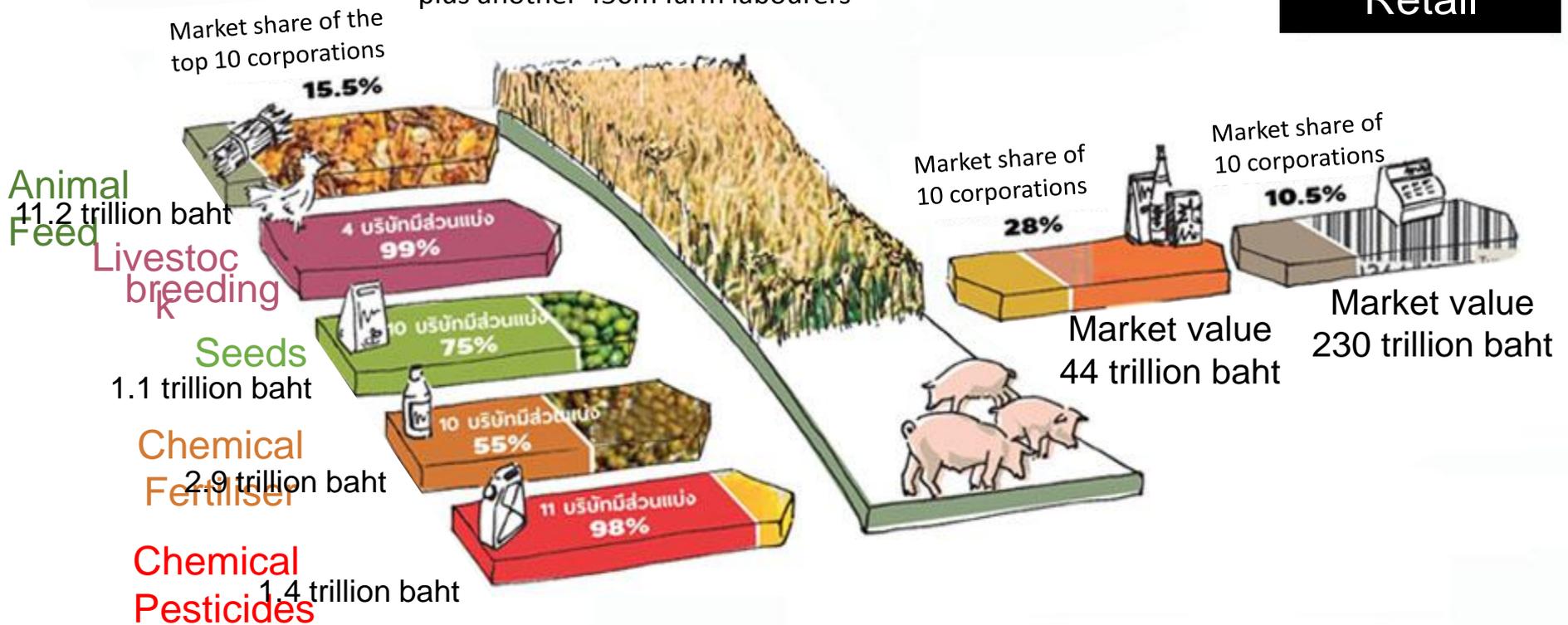
Factors of

## Agric production

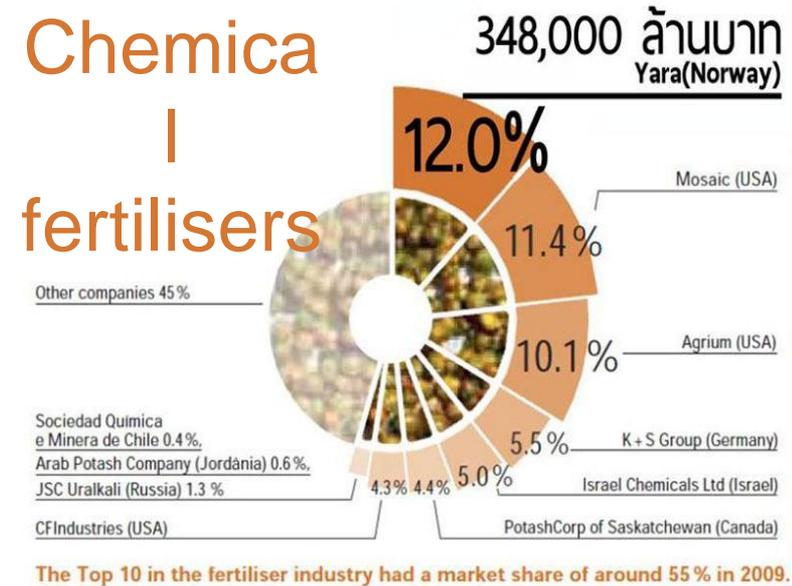
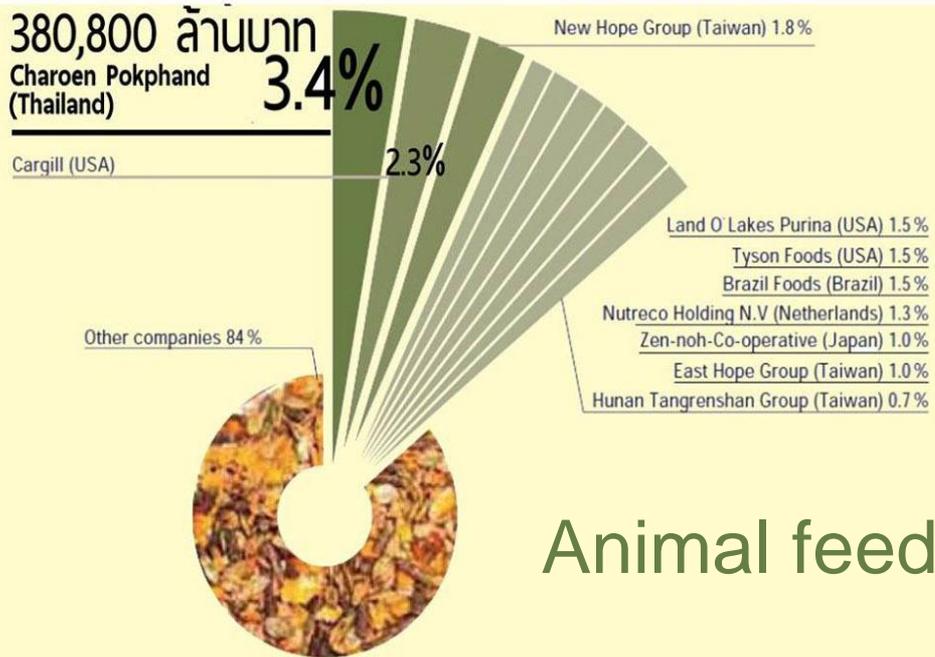
Involving one billion farmers worldwide, 85% are smallholders, plus another 450m farm labourers

## Processing

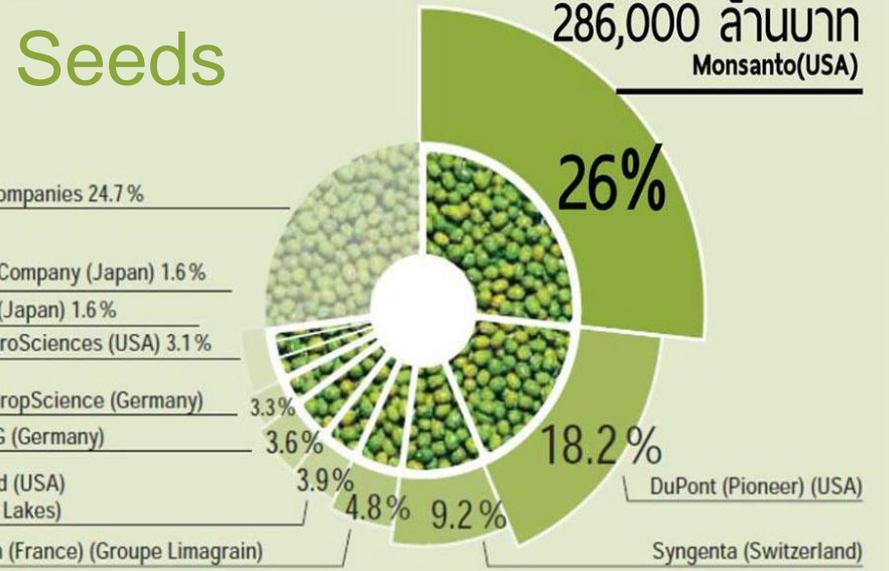
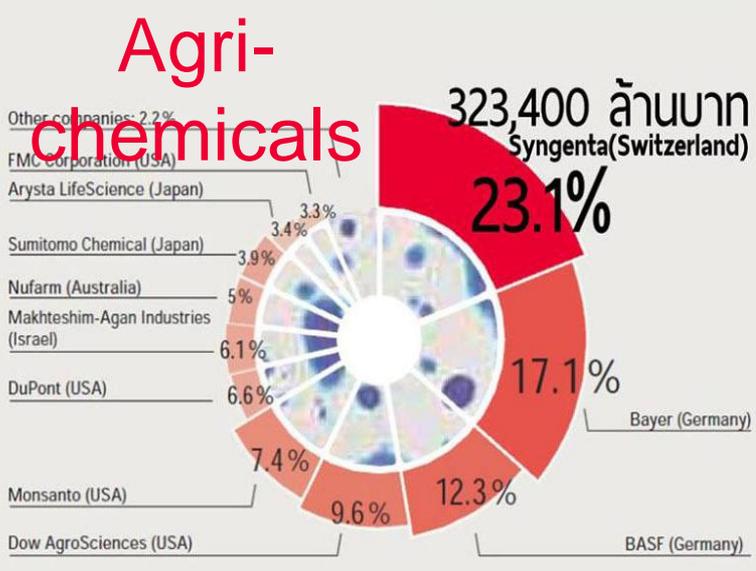
## Retail



Source: Adapted from "Agropoly" (2013) Eco Nexus – UK and Berne Declaration



The Top 10 in the fertiliser industry had a market share of around 55% in 2009.



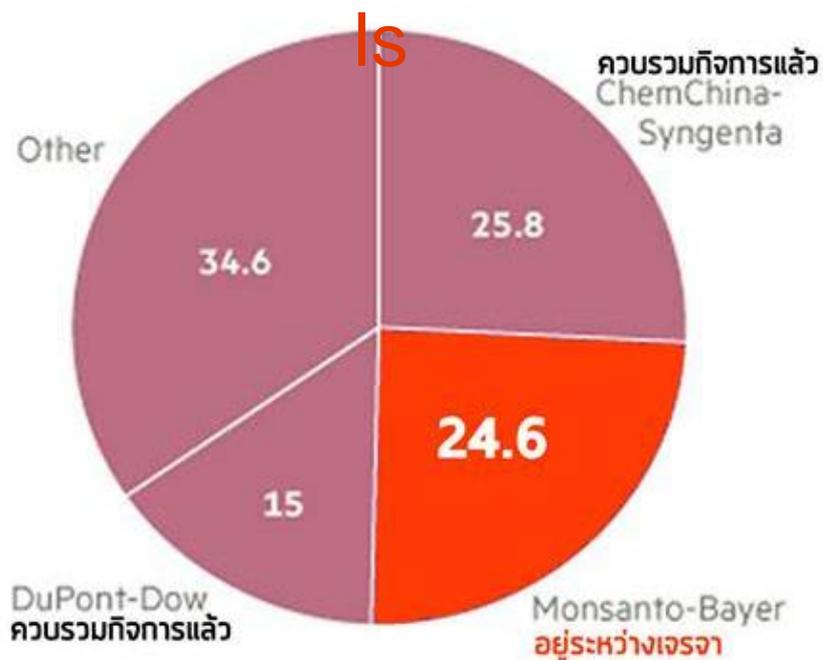
ที่มา : Agropoly A Handful of Corporations Control World Food Production (2013)

Source:

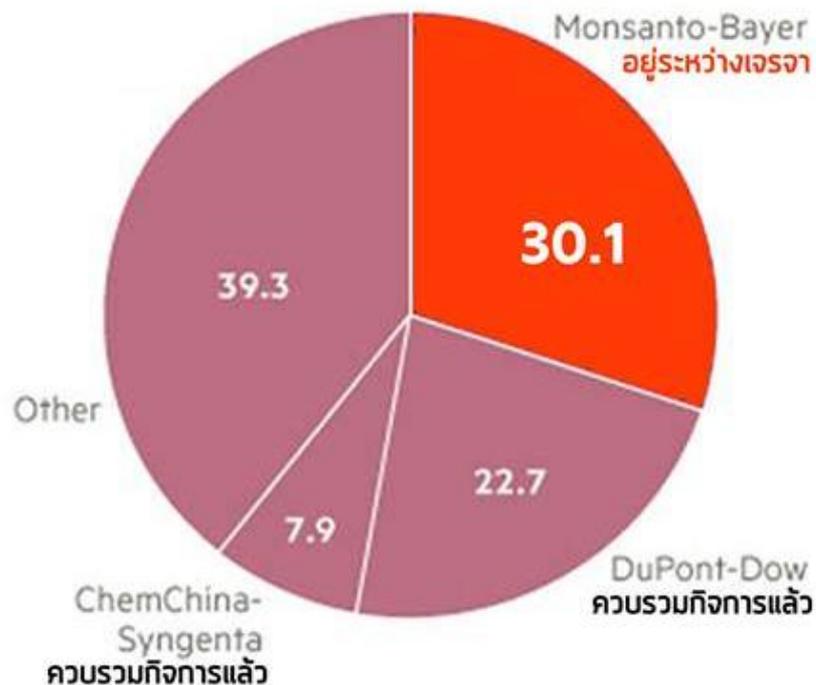
# Mergers

Global agriculture is in the hands of 3 corporations

## Agrichemicals



## Seeds



Agribusiness shake-up

Market share by sales, 2015 (%)

# How do corporations control the food and agriculture system?

World bank



WTO - FTAs



IARCs



Universities



Political parties



Governments



Banks state and private



Officials at various levels



USSR...  
กำหนดระบบเกษตรกรรมได้อย่างไร ?



# AGENT ORANGE



Awaken the mind

Awaken the mind

During the Vietnam War, the U.S. military dumped 19 million gallons of herbicide in an attempt to defoliate forest cover

The herbicide provider?



# America's chemical warfare



**AGENT ORANGE**, a chemical used by America during Vietnam War, claimed 400,000 lives, and about 500,000 children were born with deformities.





DEKALB is a hybrid brand of hybrid corn produced by the Monsanto Group, bred and produced.

**Products: DK9901, DK9955, DK8868, DK6919, DK6818**

**genuity**™

**BẢO VỆ NĂNG SUẤT**

Quản lý cỏ dại hiệu quả

Kháng các loại sâu hại chính\*

\*Cơ chế tác động kép giúp kháng sâu đục thân, sâu đục bắp và sâu khoang.

Genuity® is Monsanto's brand of transgenic products which are corn, soybean, cotton, rapeseed, alfalfa and sugar beet.



## DEKALB GENUITY GEARS

Integrating GENUITY® technology into DEKALB® hybrid maize varieties

Products: DK6818S, DK6919S.

## DRUG DETAILS BTVV

Trade name: Maxer 660SC

Name of active ingredient: Potassium salt of Glyphosate (min 95%)

Type of medicine : Herbicide





## Thuốc bảo vệ Thực vật

Thuốc bảo vệ thực vật từ Syngenta là sản phẩm của công nghệ tiên tiến nhất

## Hạt giống

Hạt lai F1  
**NK7328**

**F1 hybrid corn NK7328**

Look

ĐIỀU HƯỚNG HẠT  
**MẬT TRỜI ĐỎ**

**RED SUN**

Watermelon (Watermelon\_

Giống cà chua  
**NEW MAGIC**

**NEW MAGIC**

Tomato (Tomato)

Hạt lai đơn F1 biến đổi gen  
**NK4300 Bt/GT**

**Hybrid F1 hybrid corn NK4300 Bt / GT**

Look

Hạt lai đơn F1 biến đổi gen  
**NK66 Bt/GT**

**Hybrid F1 hybrid with NK66 Bt / GT gene**

Look

Hạt lai đơn F1 biến đổi gen  
**NK67 Bt/GT**

**Hybrid F1 hybrid with NK67 Bt / GT gene**

Look

Hạt lai đơn F1 biến đổi gen  
**NK7328 Bt/GT**

**Hybrid F1 hybrid corn NK7328 Bt / GT**

Look

ĐIỀU HƯỚNG HẠT  
**PHÙ ĐỔNG**

**FINE**

Watermelon (Watermelon\_

Giống cà chua lai F1  
**SAVIOR**

**SAVIOR**

Tomato (Tomato)

# Monsanto and Vietnam University of Agriculture collaborate to develop talents in agricultural biotechnology

Monsanto today announced its pledge of VND1.5 billion (\$71,430) scholarship for outstanding students studying agricultural biotechnology at the Vietnam National University of Agriculture.



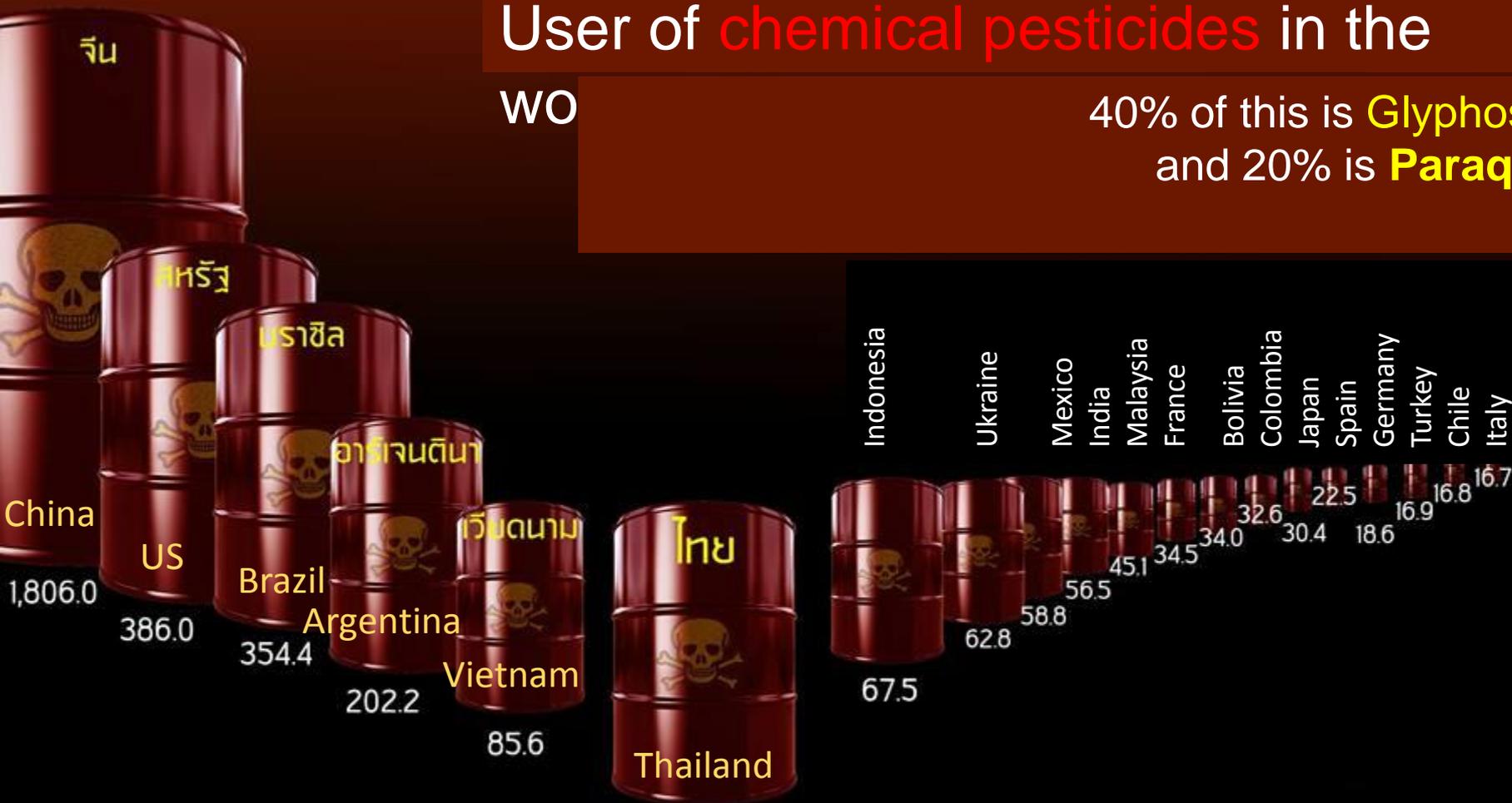
บริษัทเหล่านี้ก็ใช้วิธีต่างๆในการแทรกซึมไปในทุกวงการเพื่อประโยชน์ของบริษัทในระยะยาว เช่น วงการการศึกษา

# Thailand is the 6<sup>th</sup> biggest

User of **chemical pesticides** in the

WO

40% of this is **Glyphosate**  
and 20% is **Paraquat**.



**77.1** 77.1 million kg  
สารออกฤทธิ์(ai)

\* จินยกลการใช้สุรนาหังหมตตั้งแต 2016  
รวมเรียดนามทึบระกาศเพลอาทึนอ 2017



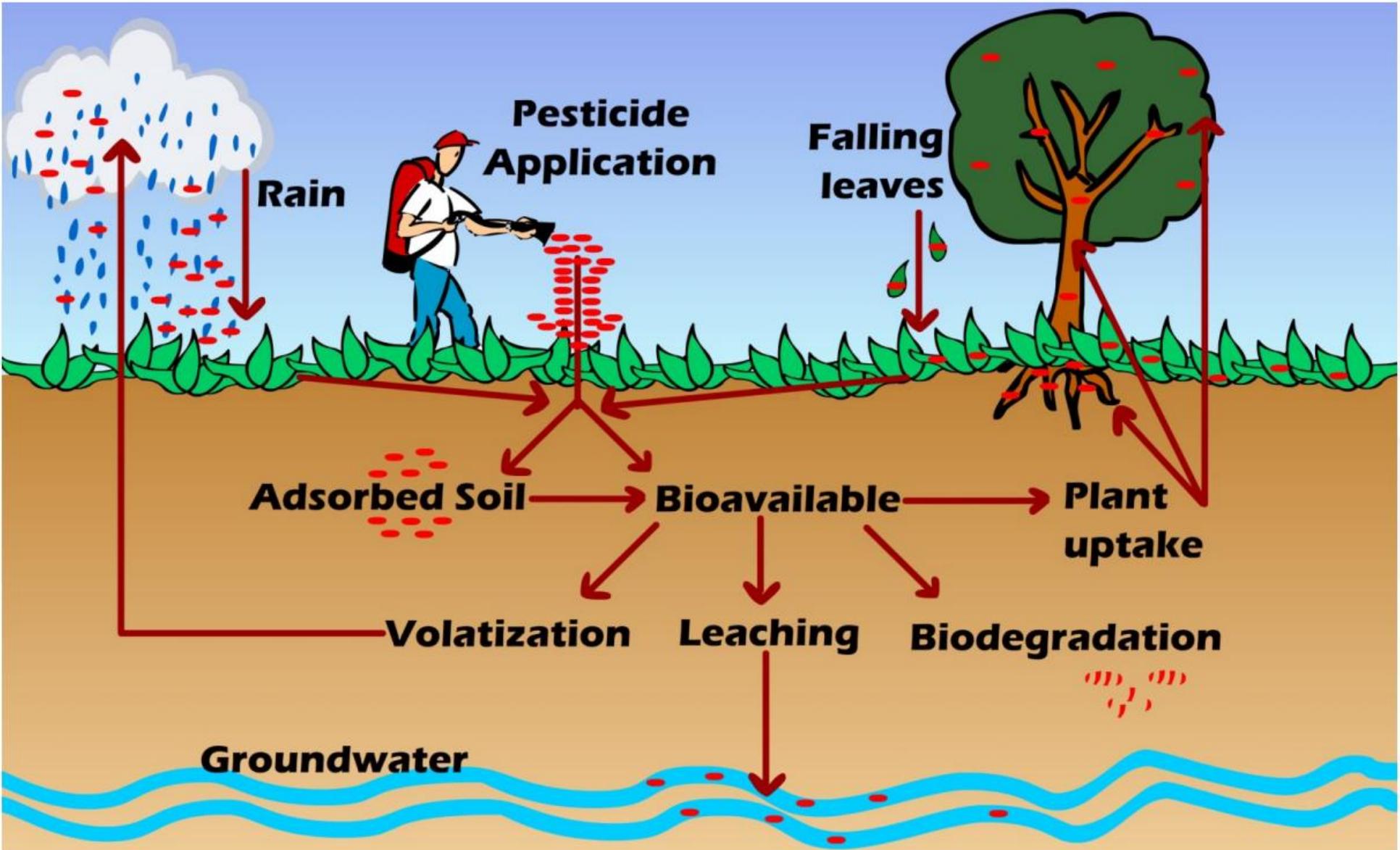
ที่มา : สถิติการใช้สารเคมีปี 2014 ของ FAO ยกเว้นบราซิล (ปี 2013) / สหรัฐ-USDA(2013) / จีน China Statistic Year Book (2012)  
เวียดนาม-VPA(2016)VPA / อินโดนีเซีย-Mordor Intelligence(2015) / ข้อมูลประเทศไทย-กรมวิชาการเกษตร(2014)

When farmers spray chemicals where do they end up?

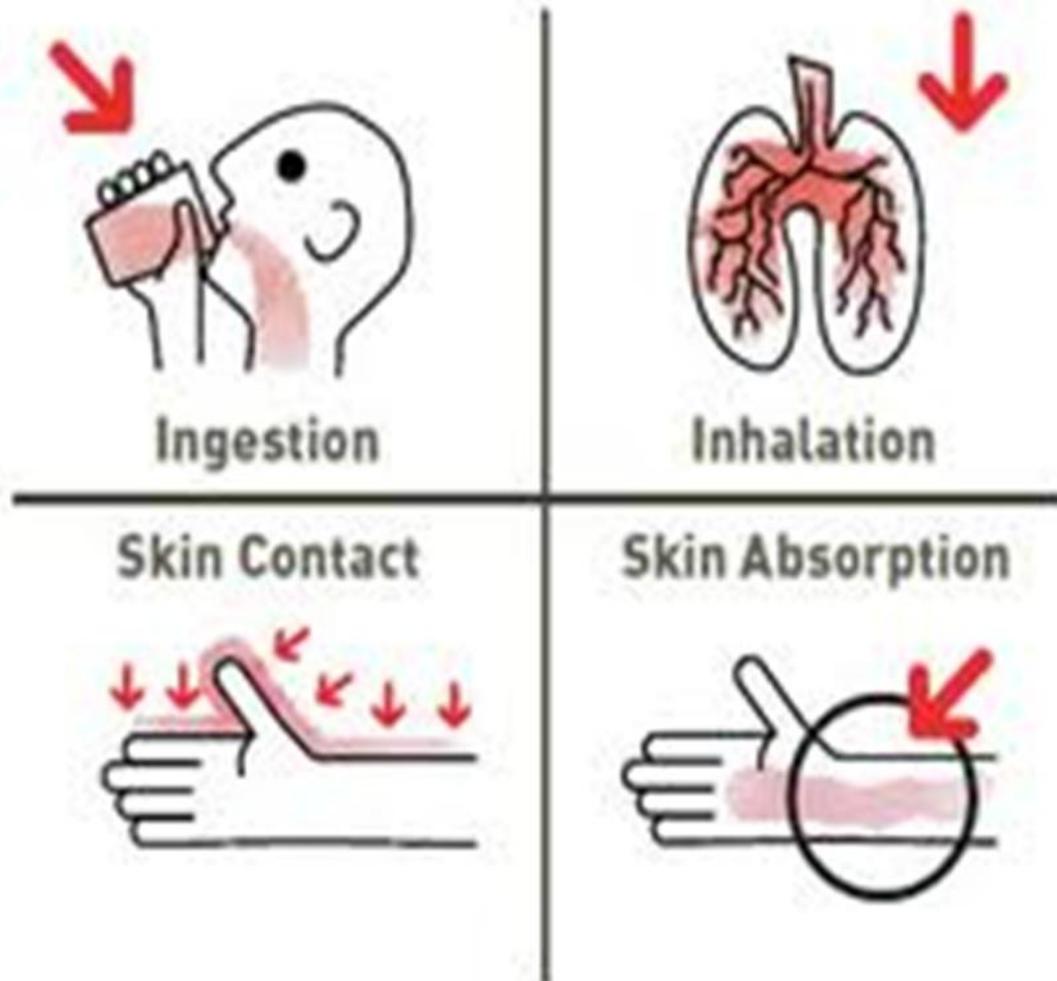


Quick question:  
If you spray 100 units of insecticide... how many of the insects (that you intended to control) will it reach?

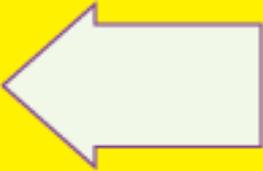




# Methods by which we accumulate pesticides in our bodies



# What are the health impacts on our bodies?



Cancer, diabetes, paralysis, physical handicap, skin problems, nervous system disorders, Miscarriages, foetal abnormalities, Alzheimer's, Parkinson's



## Acute poisoning



respiratory system, muscles, digestive system, bladder, central nervous system, cardiovascular system, saliva glands, tear glands, and eyes

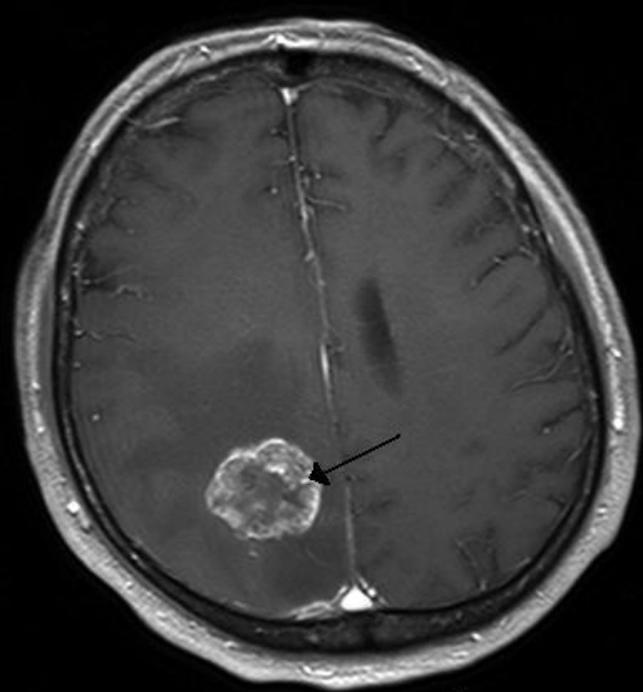
## Pesticides

Herbicides,  
Fungicides, and  
Insecticides

Used for preventing, destroying, repelling, or mitigating pests. Also used as plant regulators, defoliants, or desiccants. The majority of pesticides as registered with the U.S. Environmental Protection Agency (EPA) are used in agricultural applications, although residential application also is an important source.

Brain/Central Nervous System,  
Breast, Colon, Hodgkin Lymphoma, Leukemia, Lung, Multiple Myeloma, Non-Hodgkin Lymphoma, Ovary, Pancreas, Kidney, Soft Tissue Sarcoma, Stomach, Testicle

Annex page 40



# Brain cancer มะเร็งสมอง





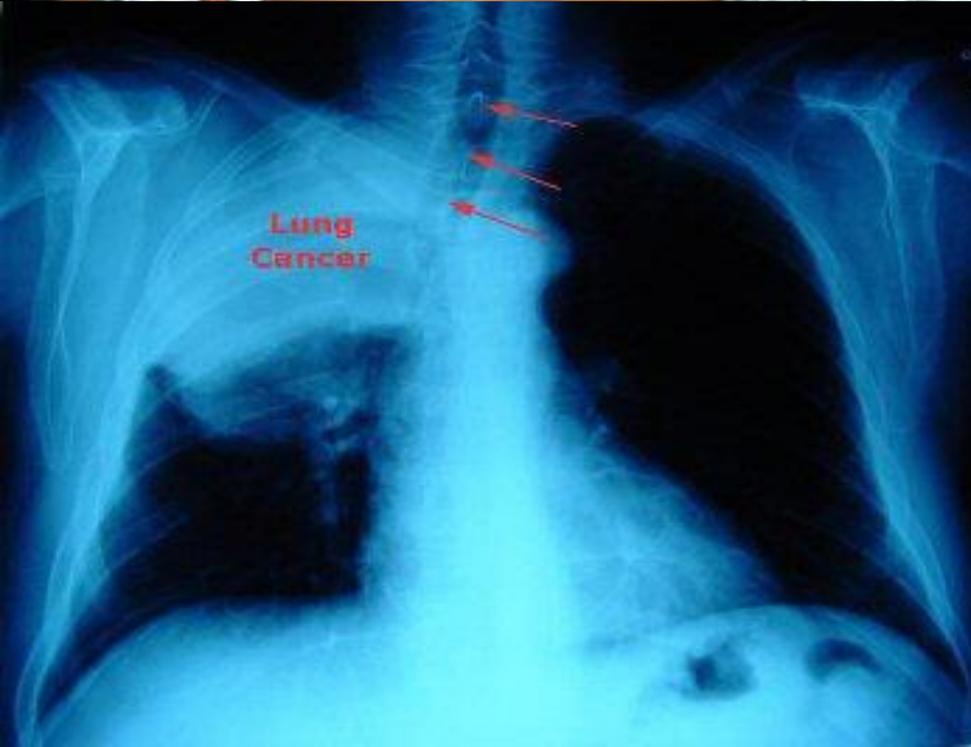
# มะเร็งต่อมน้ำเหลือง

Hodgkin & Non-Hodgkin  
Lymphoma



# Lung cancer

## มะเร็งปอด





# Breast Cancers

มะเร็งเต้านม





# Kidney cancer

มะเร็งไต



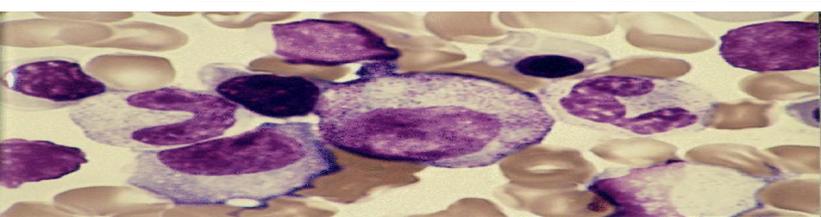
**มะเร็งเนื้อเยื่ออ่อน**

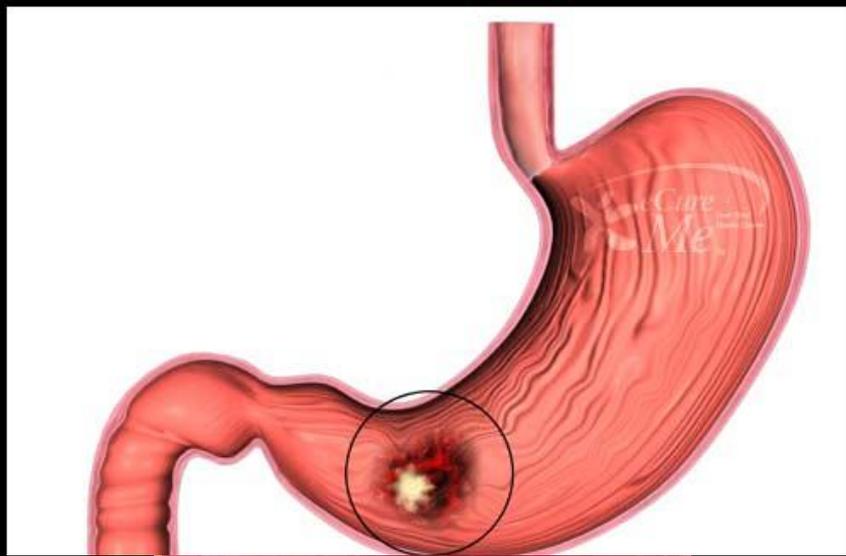
**Soft Tissue Sarcoma**





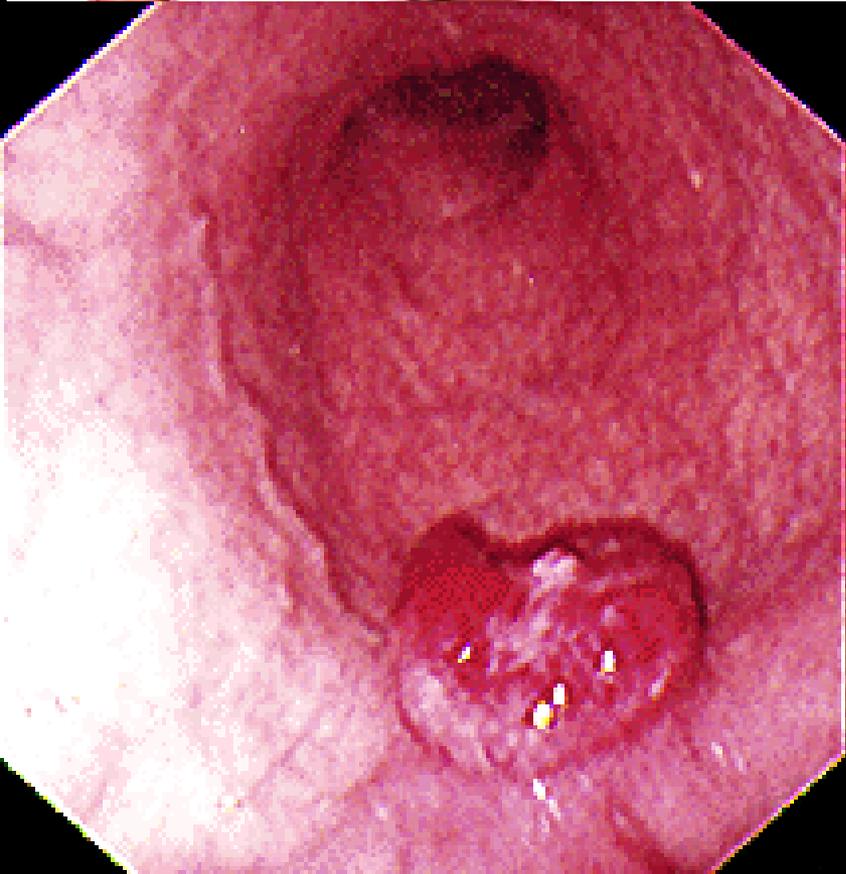
# มะเร็งเม็ดเลือดขาว Leukemia

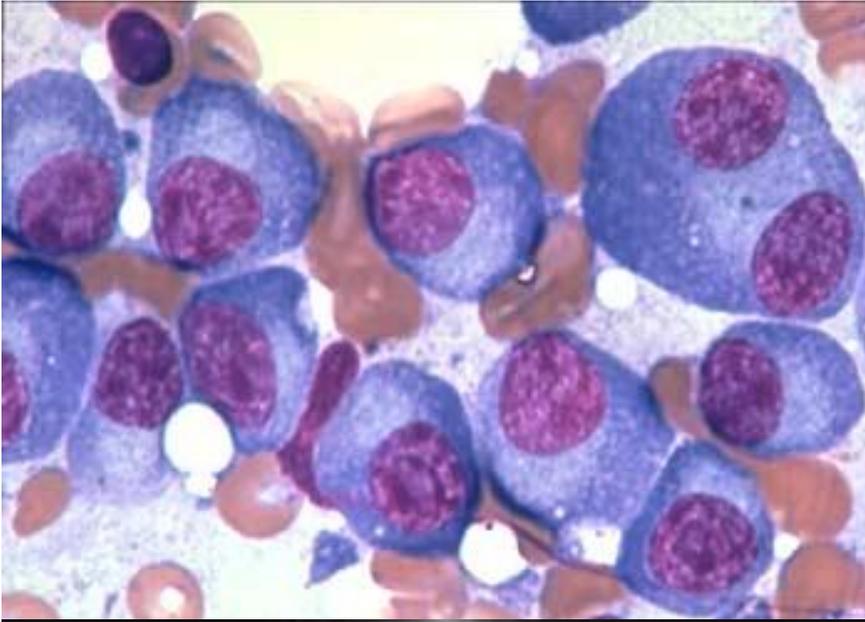




# Stomach cancer

มะเร็งกระเพาะอาหาร



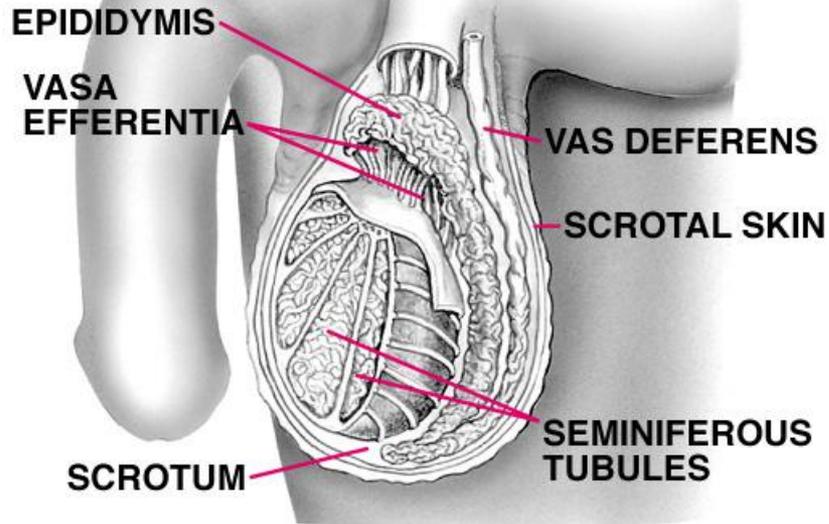


มะเร็งไขกระดูก

Multiple Myeloma

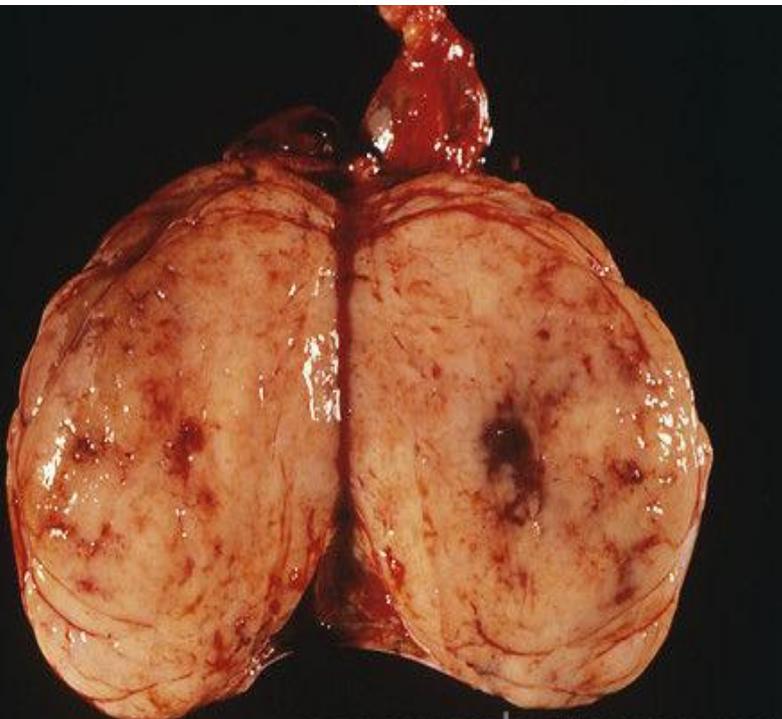


# Testes



## Testicular cancer

มะเร็งลูกอัณฑะ





โรคผิวหนังแข็ง

**Scleroderma**

# สมองเสื่อม Alzheimer's

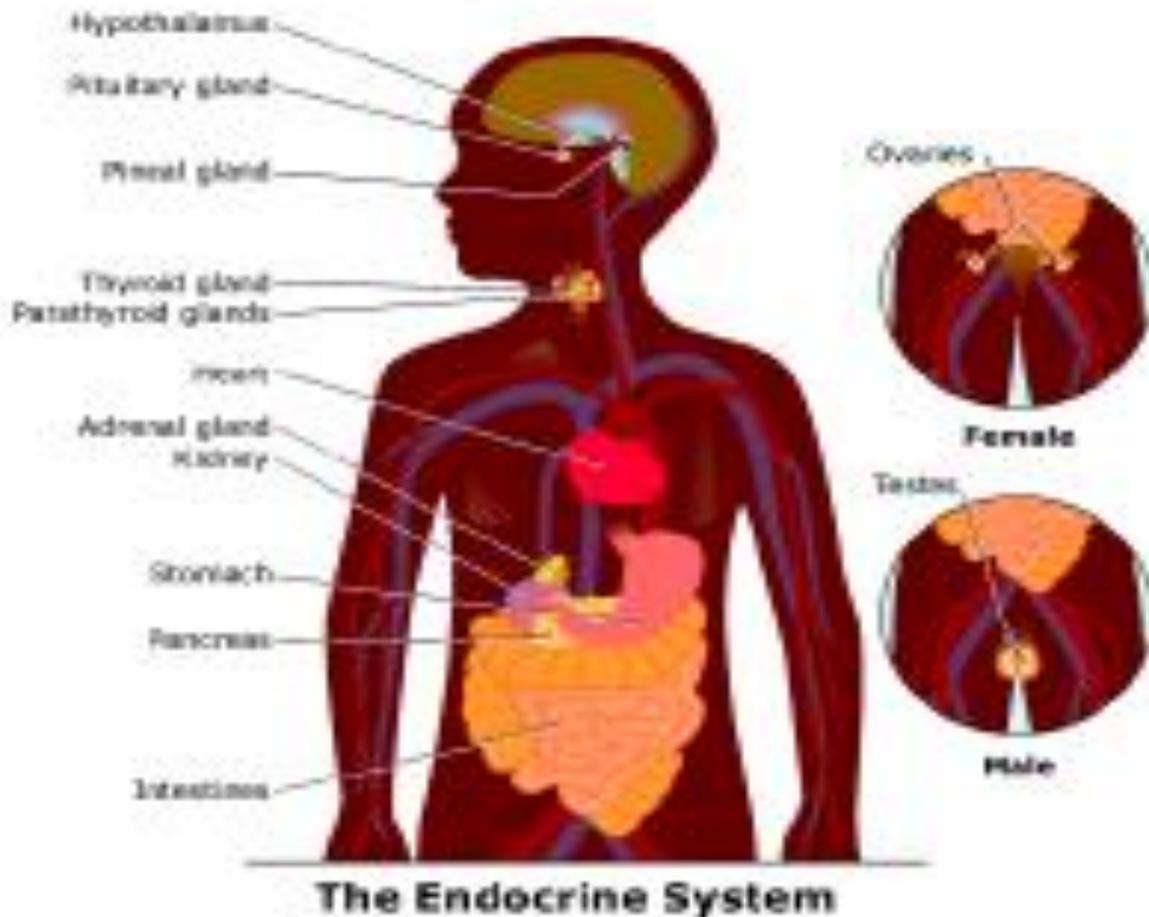


# หอบหืด Asthma



# โรคระบบต่อมไร้ท่อ

## Endocrine diseases

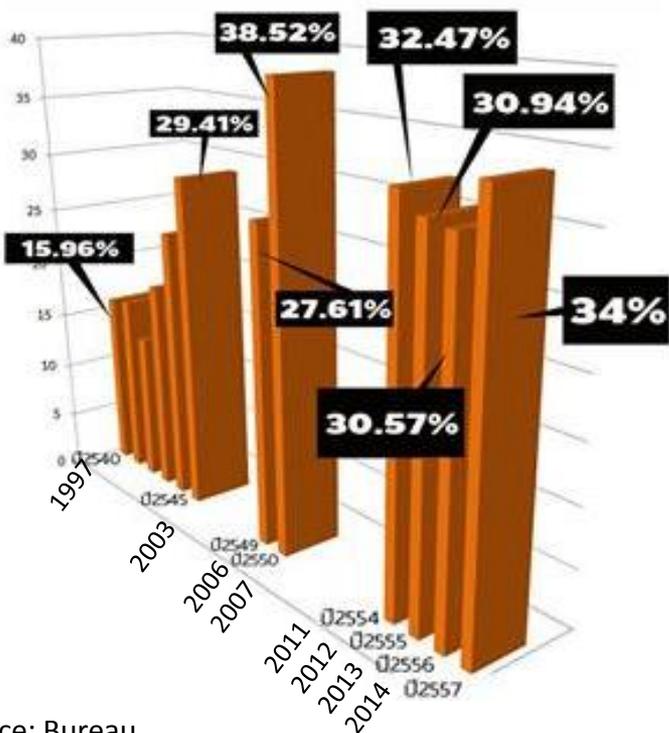




# Diabetes

# เบาหวาน

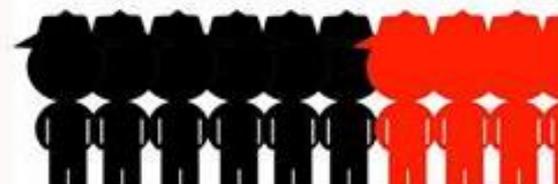
Data from the pesticide screening of farmers for toxins in their blood - “at risk” and “not safe” 1997-2014



Source: Bureau of Occupational and Environmental Diseases, Thailand

Results of pesticide screening 2014

**34%**



Of farmers have toxins in their blood levels that indicate they are “at risk” and “not safe”. This has been an increasing trend since 1997

# Insecticides found in *consumer's blood!*

25-28 มิ. ย. 58

จำนวนคนสำรวจ 1261 คน

ปกติ 4.44%

ปลอดภัย 17.13%

มีความเสี่ยง 59.32%

ไม่ปลอดภัย 19.11%



# A painful truth

## Pesticide residues in fruit and vegetables 2016, by source

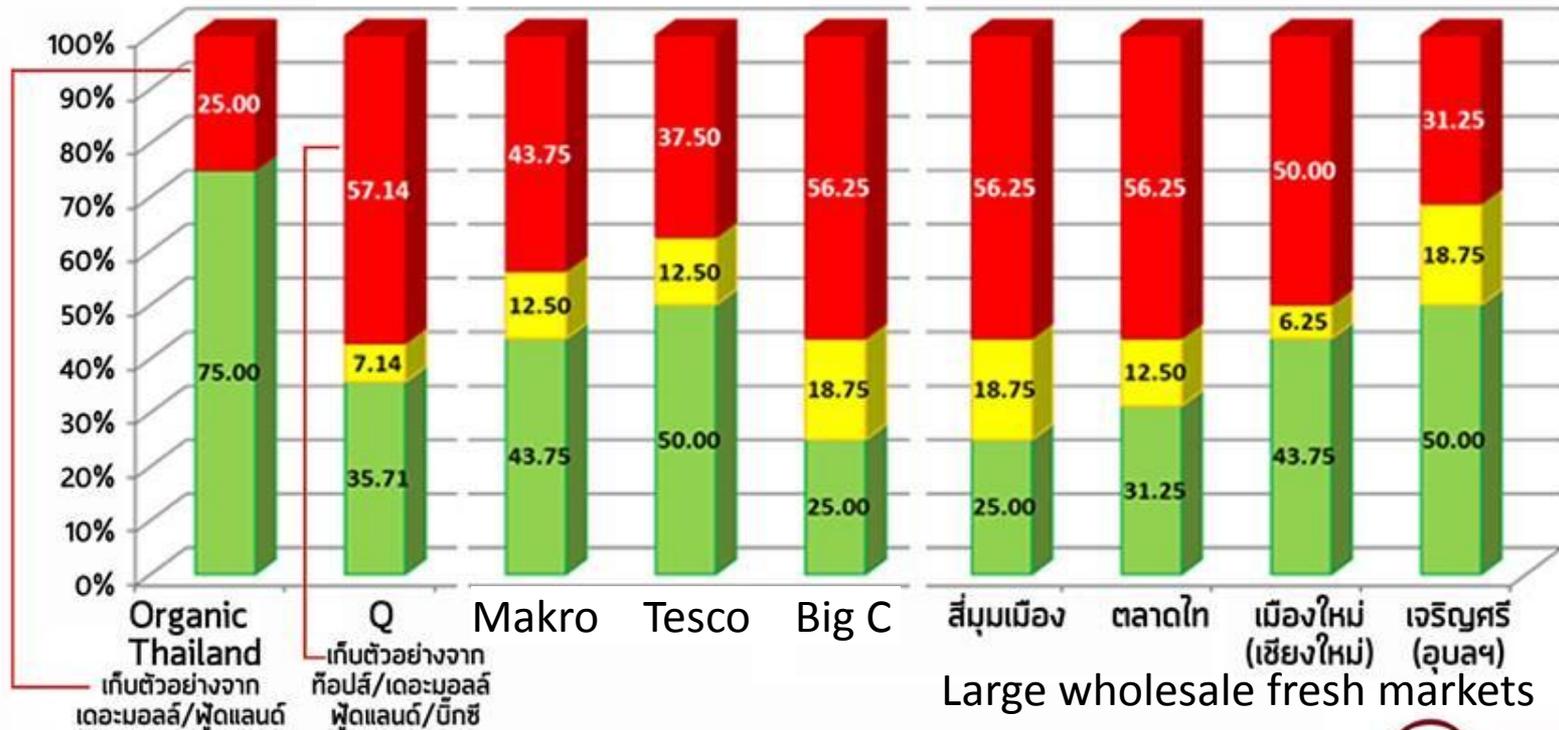
**25%**

Of organic vegetables, certified by various state agencies, found to have excess pesticide residues

**57%**

Of fruit and vegetables with the state certified Q label, found to have excess pesticide residues, in more cases than any other source

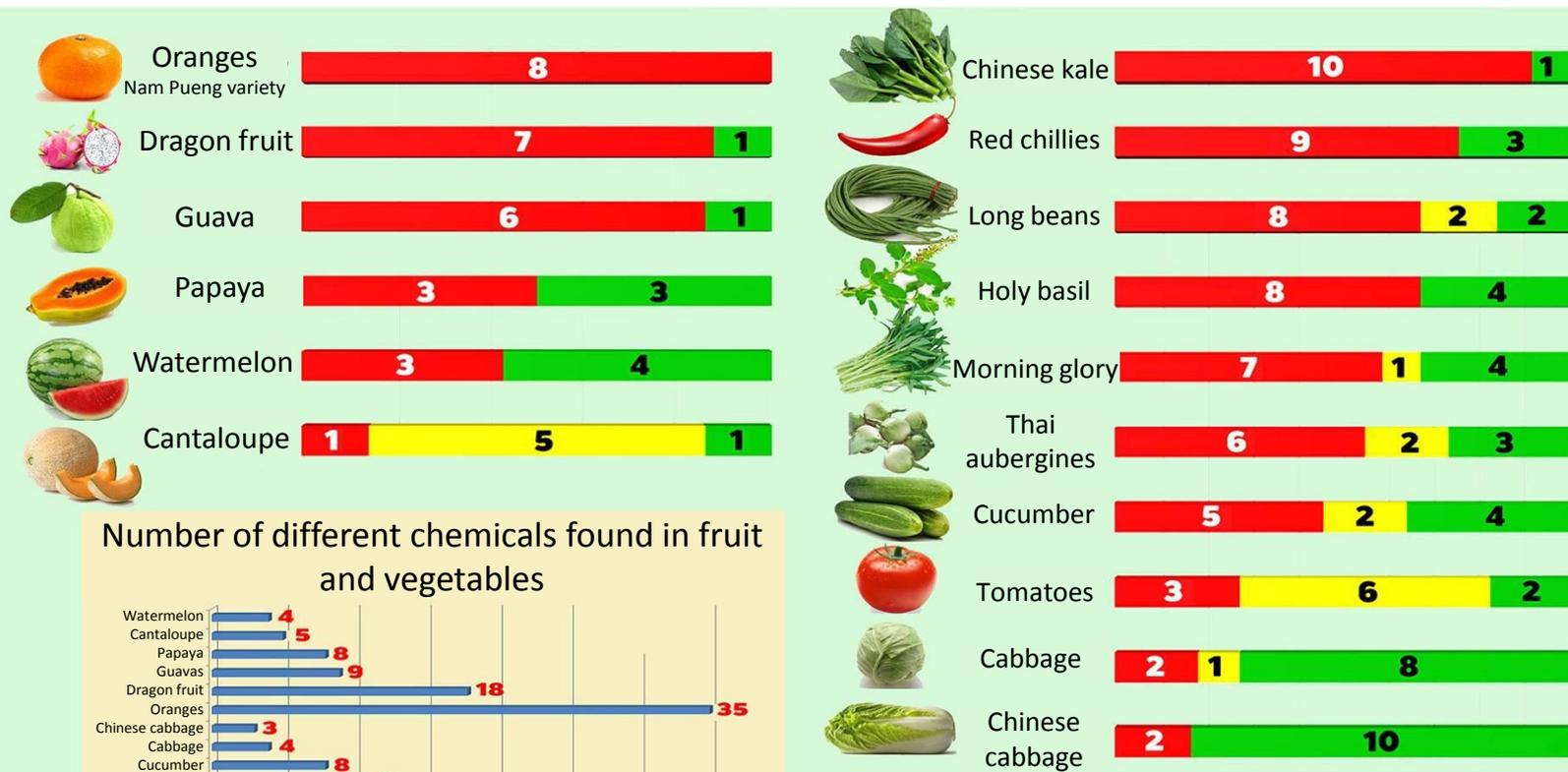
Results show that fruit and vegetables from modern trade outlets were comparable with those from wholesale fresh markets, **just more expensive**



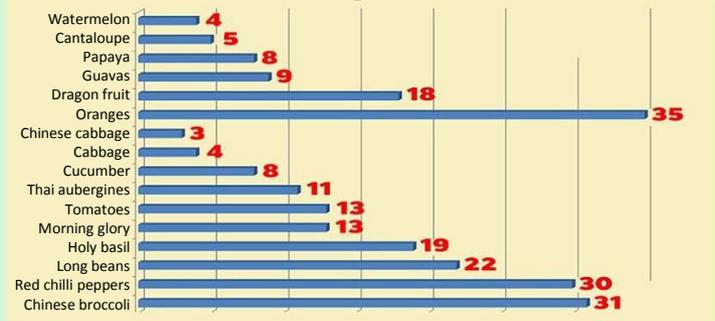
■ Residue free
 ■ Residues within max limits (MRL)
 ■ Excessive residues

# Over half of fruit and vegetable samples found not

Comparison of fruit and vegetables with residues above maximum limit (MRL)



Number of different chemicals found in fruit and vegetables



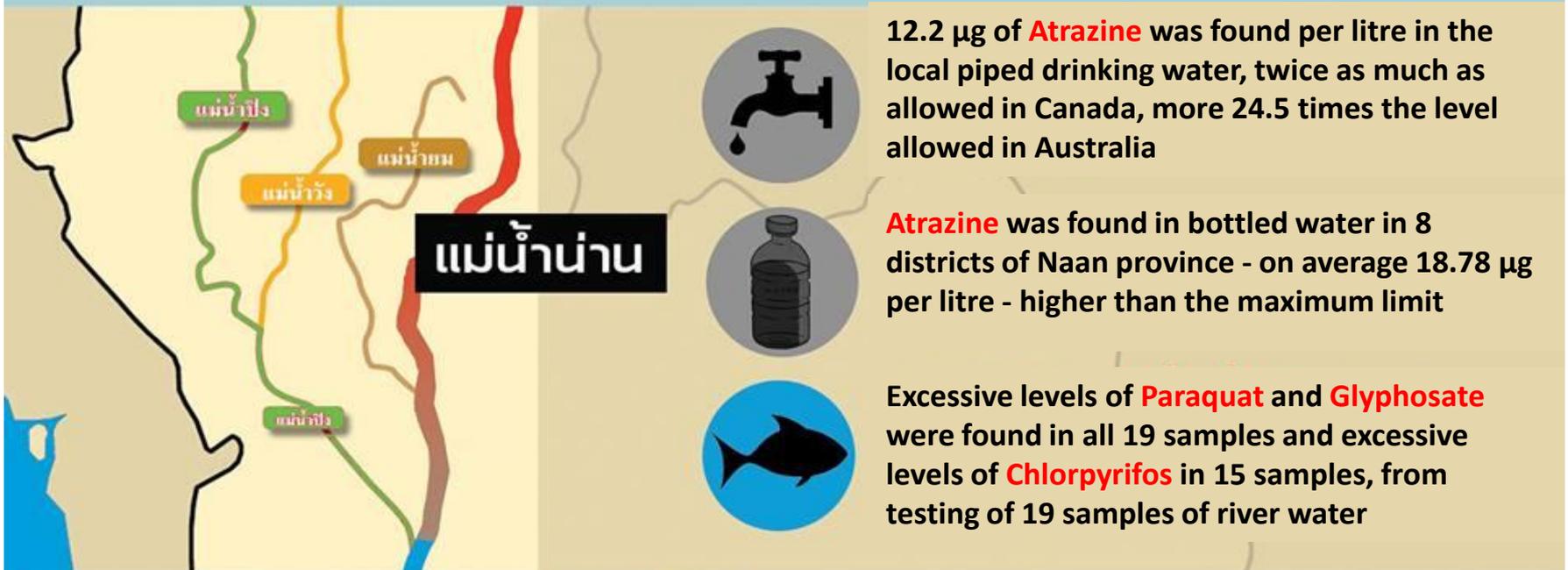
■ Residues above MRL  
■ Residues found but below MRL  
■ No residues found



158 samples were collected on 23-29 August 2016, sent to laboratory certified to ISO/IEC 17025:2005 standard, tested for over 450 different chemicals

# Poisoned rivers?

## From the Naan to the Chao Phraya



**40%**

**แม่น้ำเจ้าพระยา**

Of the water volume of the Chao Phraya comes from the Naan River

**ได้จากแม่น้ำน่าน**

ข้อมูลจาก :

การวิจัยเชิงบูรณาการเพื่อสร้างเสริมศักยภาพ  
หน่วยงานท้องถิ่นในการจัดการและป้องกันการปนเปื้อนสารพิษ  
พื้นที่ต้นน้ำน่าน, คณะวิศวกรรมศาสตร์ ม.นเรศวร เผยแพร่ผ่านรายการ



# Glyphosate timeline

From advertising it's safer than salt... to news that it is carcinogenic

1974

Monsanto finds Glyphosate can be used as a herbicide. Sold under the brand name "Round Up"

1996

First crop of GMOs resistant to herbicides

Attorney General of New York State sues Monsanto after advertising that Glyphosate is safer than table salt

2008

Glyphosate becomes the no 1 most used pesticide in the world

2013

Chulabhorn Research Institute finds that Glyphosate stimulates growth of breast cancer cells

15 fold increase in use of Glyphosate use in US from 1996-2015. Worldwide concern. Glyphosate found in atmosphere, water, everyday foods, esp in US

2015

International Cancer Institute - WHO - announces that Glyphosate is a "probable" carcinogen Type 2A

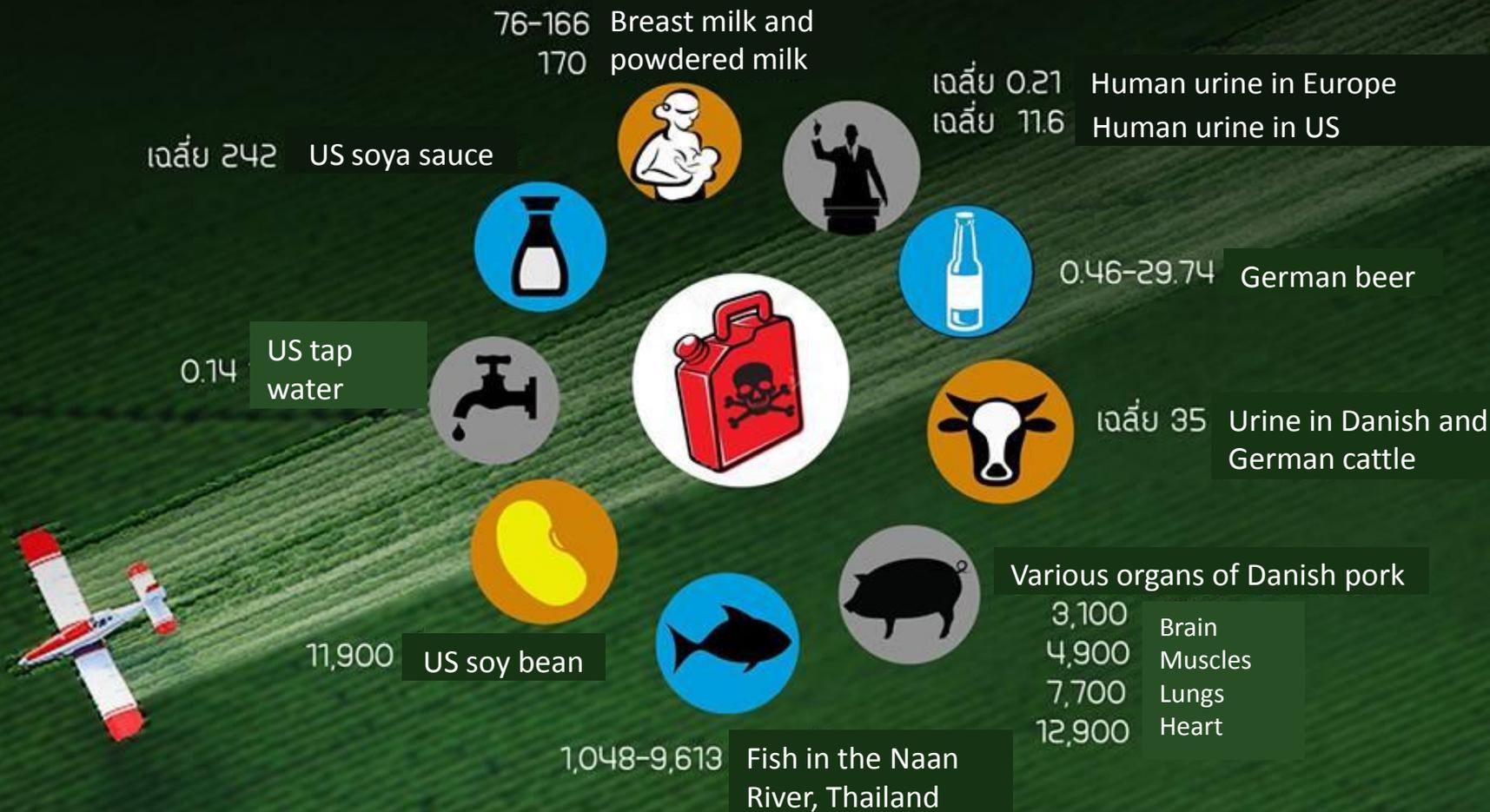
2016

Countries start banning. Many impose strict controls. EU reviews registration – issues temporary permit until 2017

Thailand imports as much as 58 million kgs. Naresuan University team finds 1,048-9,613 µg/kg of Glyphosate in upstream Naan River. The max limit is 50 µg/kg.

# After spraying, where does it end up?

Residues of Glyphosate end up in human food and our bodies\*



Unit of measurement

\* หน่วยที่ใช้วัด : Parts Per Billion (ppb)

ที่มา : MAA-USA, FoE-Europe, Kruger, Rubio, Umweltinstitut, คณะวิจัย ม.ออสเตรีย (2014-2016)

Breaking news!

ไกลโฟเฟอเลต Glyphosate

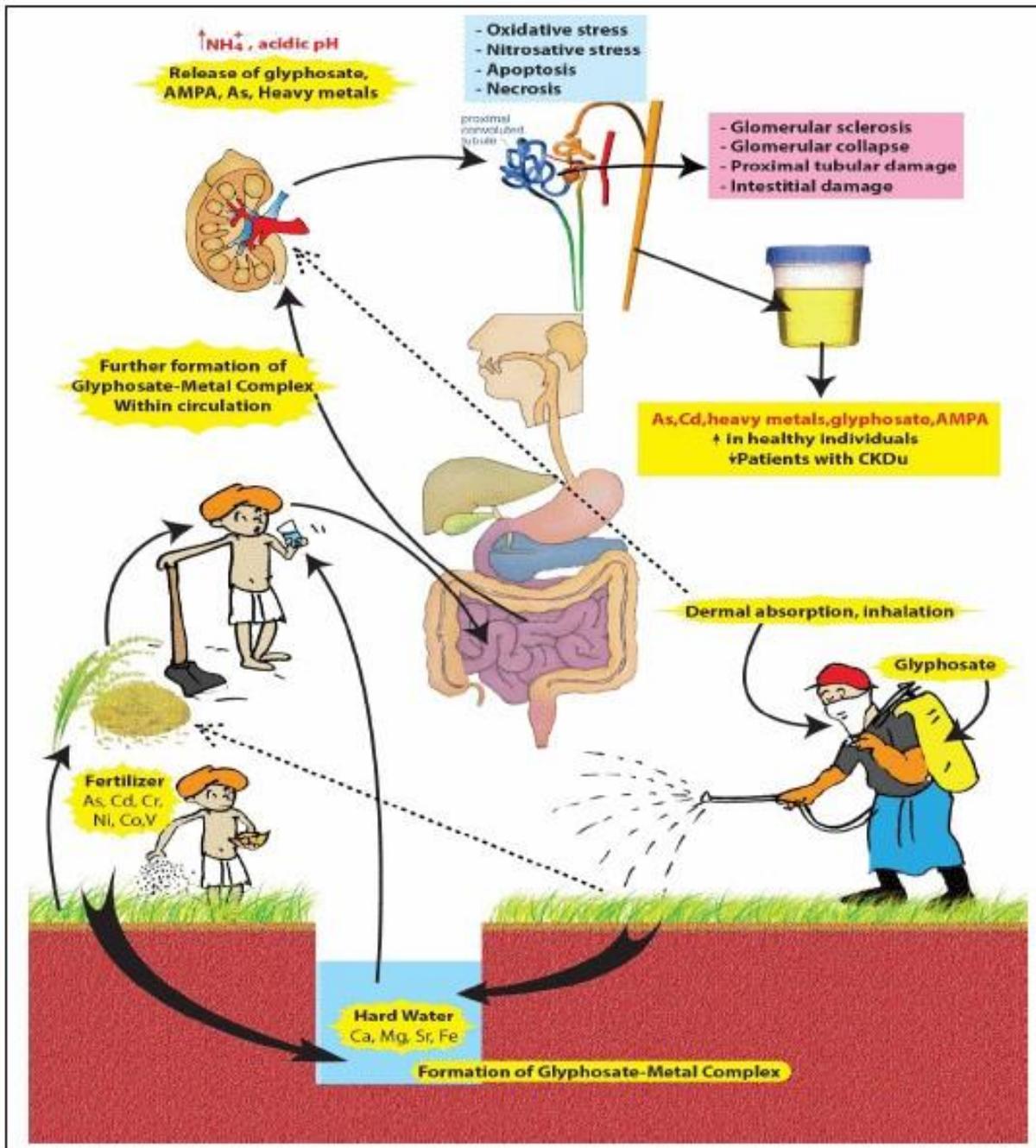
**Glyphosate** has been classified by the UN's International Agency for Research on Cancer as "probably" carcinogenic

มะเร็ง Cancer

The herbicide **Glyphosate** or "**Round Up**" is the most used pesticide in the world and in Thailand. It has been classified by the UN's IARC as Type 2 A (probably carcinogenic to humans)

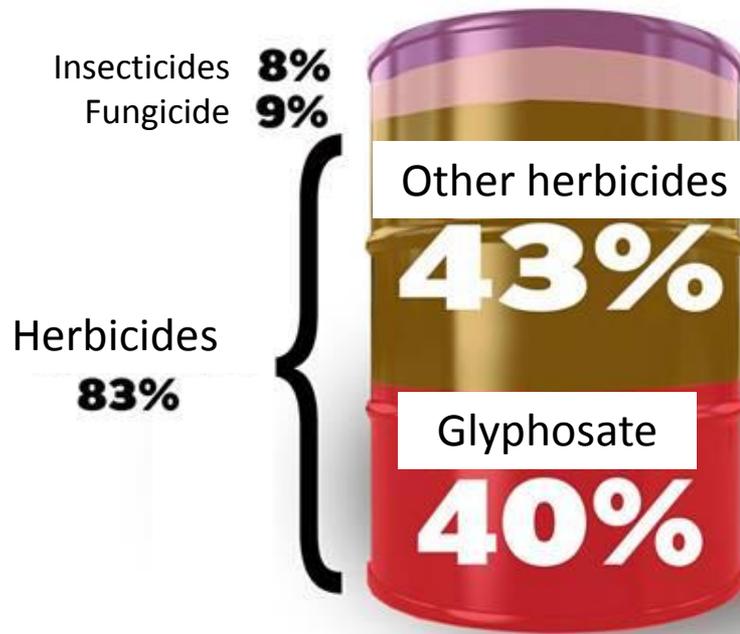
Glyphosate was developed by the multinational **Monsanto** corporation who owns the patent for "Round Up Ready". Monsanto GM crops

Monsanto has advertised that their Glyphosate is "**safer than table salt**". In 2014, Thailand imported as much as **63.3 million kgs** of Glyphosate.



# Sri Lanka, El Salvador, Netherlands, France **Ban Glyphosate!** **!**

Imports of pesticides 2014



In 2014, Thailand imported

# 63 million kg

The International Cancer Research Institute of the WHO announced that it was probably carcinogenic

Sri Lanka and El Salvador have banned its use and sale completely since it has impacts on the kidneys and can cause cancer.

France and Netherlands have banned its use in parks, homes and public areas.

Brazil Russia Mexico and many other countries are in the process of considering how to control.

# PARAQUAT

## A POTENT WEED KILLER IS KILLING PEOPLE

BY ANDREW C. REVKIN

A typical case: The girl is about 16, thin, weak and very sick. She is rushed down the hospital corridor, beneath the whirling ceiling fans that do nothing but push the hot, steamy Caribbean air around and around. She has been vomiting for hours, her hysterical mother says. The doctors search and probe and test. The father arrives and pulls out a bottle half full of a brown liquid that clings like syrup to the glass. Paraquat.

The course of the girl's poisoning is textbook, says her doctor—just like the 150 he's seen before. For 40 more hours she vomits. Her yellowing eyes say her liver is failing. Her mouth and throat fill with lacerations and sores, and she can no longer swallow. The doctors hear rumbling in her chest. Her urine is brown.

Then, for a couple of days, things look better. She sits up in bed, eats and can talk. But the doctors aren't fooled by her progress, just frustrated. The next day, her breathing becomes labored, her chest heaves. The doctors stand by helpless, able only to kill the pain with morphine. She finally dies of suffocation—her lungs useless sacks of scar tissue.

Against his will, Dr. Rahid Rahaman, at San Fernando General Hospital on the fertile island of Trinidad, is becoming the world's expert on paraquat poisoning. He sees almost a case a week, and almost every patient dies.

There are many sides to paraquat. To most Americans, it is the controversial weed killer used to destroy marijuana fields—first in Mexico, then in Florida and soon, the State Department hopes, in South America.

Farmers know it as one of the most versatile tools in agriculture. Paraquat is used to control weeds and speed the harvest on more than 10 million acres of American crops—everything from soy-

beans to sunflowers, cotton, wheat and corn. But that is just the beginning.

Paraquat is replacing the plow—the centerpiece of agricultural technology since the Bronze Age—as the standard means of preparing a field for planting. By the turn of the century, paraquat, and what is called no-till farming, will have made the plow obsolete on more than half of America's farmland.

And more new uses are promoted every year by paraquat's British manufacturer, Imperial Chemical Industries, and its American partner, Chevron Chemical Company. In fact, an ICI spokesman confidently predicts that there is a use for paraquat "on every hectare of agricultural land in the world."

Paraquat is a paradox: "Paraquat is probably the most effective herbicide that exists right now on the Earth," says Dr. Edward Block, a University of Florida lung specialist who has treated five paraquat victims. But, he is quick to add, "it is also one of the world's worst poisons." Although the lethal doses have not been accurately determined, paraquat can kill if only small amounts are swallowed, inhaled or spilled on the skin.

When asked how many people have died from paraquat poisoning, most medical experts and industry spokesmen recite figures between 600 and 1,000. And about half of those are suicides. Considering the worldwide popularity of the herbicide and its 20-year history, the experts say that is a very small number.

But a review of the available medical literature and personal interviews with physicians and government scientists around the world indicate that the reported death rate is a drastic underestimate.

In Trinidad—with a population of 1.2 million—officials report two deaths a month from paraquat poisoning. (Given a

similar case would lo... But Dr. 1... ly of deat... nando, fi... mate. A... Pacific, t... was four... this popu... A farm... dressing, husband After sev... was no g... In Pa...

worker spraying paraquat slipped and fell. Some of the herbicide spilled out of his backpack canister, saturating his clothing. By afternoon his skin had begun to blister. After a week, he developed a cough. Thirteen days later, he died.

The owner of a citrus grove in Florida borrowed some paraquat from a friend because he was not licensed to buy it himself. He later sipped some from a container he thought held water. Although he told his doctor he had spit it out before swallowing any, he soon died.

The list goes on—victims of circumstance or ignorance, accidents or suicides. Moreover, the risk of acute poisonings has recently been overshadowed by evidence that paraquat may pose a hazard to the long-term health of farmworkers and others who are frequently exposed to it.

*Continued*

*A paraquat brochure promotes a deadly practice (inset). A page reprinted from an ICI leaflet shows a barefoot workman spraying paraquat on a rice paddy—and on his legs. Used correctly, paraquat may halt the ravages of erosion (background).*



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**“It’s terribly toxic. Once it is in your body, there is no antidote.”**

Mark Davis, senior officer for pesticide management at the Food and Agriculture Organization of the United Nations.

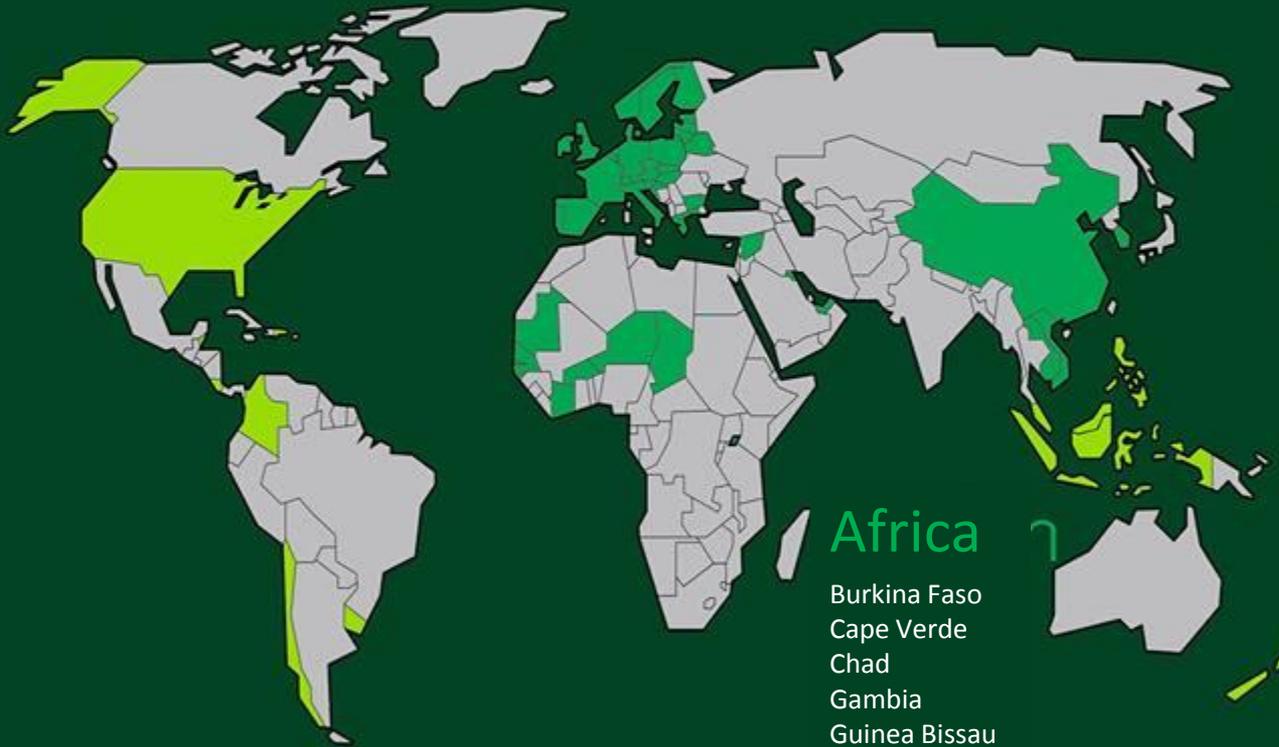


<http://www.reuters.com/investigates/special-report/brazil-pesticides/>

# 48

## Countries have banned Paraquat

รวมทั้งประเทศที่เป็นผู้พัฒนา ครอบคลุมตลาด และผู้ผลิตรายใหญ่



### Europe

- Hungary
- Iceland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovenia
- Slovakia
- Spain
- Sweden
- UK
- Belgium
- Cyprus
- Czech Rep
- Switzerland
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Austria
- Croatia
- Bulgaria
- Norway

### Asia

- China\*
- South Korea
- Sri Lanka
- Vietnam
- Laos
- Cambodia
- Syria
- Kuwait
- UAE

### Africa

- Burkina Faso
- Cape Verde
- Chad
- Gambia
- Guinea Bissau
- Mauritania
- Niger
- Senegal
- Ivory Coast

-  Banned Paraquat
-  Strict Control

\*banned in liquid form

Major food and agriculture corporations

# Have banned Paraquat

When the world refuses to use toxic chemicals that affect their health

9

## Retail

Marks & Spencer  
Co-op - สหราชอาณาจักร  
Coop's - สวิตเซอร์แลนด์

## Fruit and veg

Dole Food มีกิจการใน 90 ประเทศ  
Chiquita มีกิจการใน 70 ประเทศ

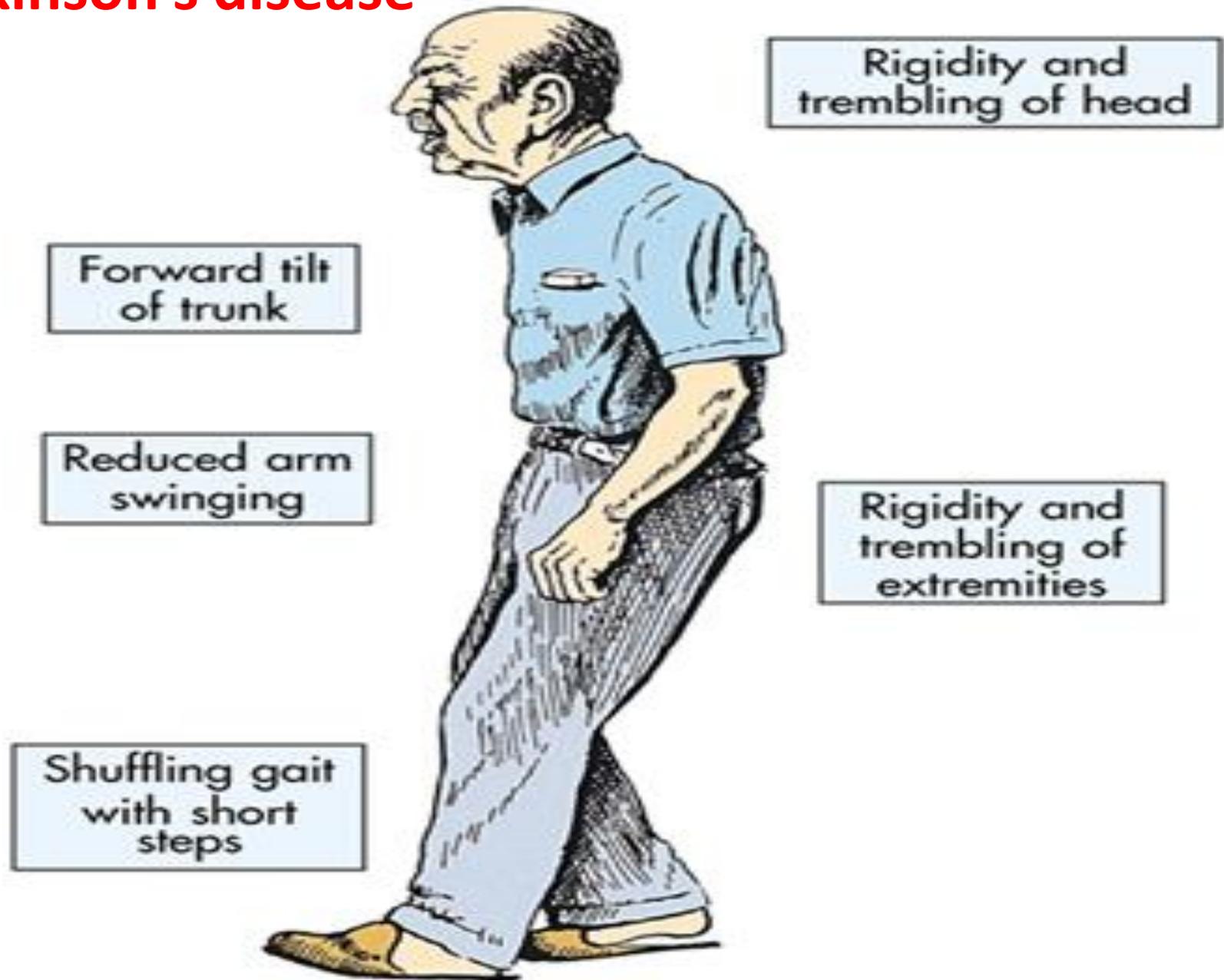
## 14.8 million rai of oil palm

Sime Darby Plantation	600,000	แฮกตารา
Golden Agri Resources	489,000	แฮกตารา
Felda Global Venture	427,000	แฮกตารา
IndoAgri	335,000	แฮกตารา
Wilmar	242,000	แฮกตารา
IOI Corporation	230,000	แฮกตารา
United Plantation	51,000	แฮกตารา

## Product standards

RSPO (Roundtable on Sustainable Palm Oil)  
Forest Stewardship Council  
The Common Code for the Coffee Community  
Rainforest Alliance  
Fairtrade Labelling Organizations  
Pro Terra

# Parkinson's disease



# Fatalities

Of patients poisoned with Paraquat

Levels of acute pesticide poisoning exceeding the levels allowed to be used

**51.9 %**  
Consumed orally

**10.2 %**  
Absorbed through skin

**14.5 %**  
Accidental exposure

**8.2 %**  
Occupational exposure



**49-54% of newborns & mothers found to have Glyphosate in their serum.**

**17-20% of newborns and mothers detected with Paraquat**



Tarnishing the country's reputation

# Our soil soaked in poison?



Ministry of Public Health lobbying the  
Agriculture Ministry to prohibit the use of  
highly dangerous chemicals



Ready to prohibit use in public areas, homes and watersheds  
FAO classifies this as a probable carcinogen

นำเข้า **61.8** Million kg imported



Ready to prohibit use

Highly acutely poisonous. Banned in over 40 countries,  
including China and Vietnam

นำเข้า **31.5** Million kg imported



Ready to prohibit use

Slows development of brain in children.  
Most common residue in fruit & veg

นำเข้า **2.1** Million kg imported



BIOTHAI  
22/3/2017

สถิติการนำเข้า : กรมวิชาการเกษตร 2559

# Oppose toxic corporations

We support the proposals of the Ministry of Public Health to ban

**Paraquat** ban Chlorpyrifos strictly control Glyphosate

To annul the registrations and take up the recommendations of the working groups of the 4 main Ministries as soon as possible

## Paraquat

● 17-20%

Of newborns and mothers detected with this

● 8-15% Of patients who have been treated with acute poisoning while spraying or by accident, sometimes fatally

● They are at risk of Parkinson's disease

● 48 Countries have not authorised its use

● Agricultural crops that have used Paraquat, eg Palm oil etc have faced opposition in other countries



## Chlorpyrifos

● 10% Of fruit and veg in Thailand have been found to be contaminated with these residues

● Affects brain development in infants over long term

## Glyphosate

● 49-54% Of newborns & mothers found to have this in their serum

● WHO considers this is probably carcinogenic

● Accumulated in soil minerals, causes kidney disease

● Sri Lanka has banned it, EU prohibits use in public areas



**Thai-PAN**  
Thailand Pesticide Alert Network