# bantay kinaiyahan

## THE DAY THE ROOF FELL IN

Malaria once infected 9 out of 10 people in North Borneo (Brunei). In 1995 the WHO began spraying the island with dieldrin (a DDT relative) to kill malaria-carrying mosquitoes. It was so successful that the dreaded disease was virtually eliminated. Other unexpected things began to happen, however. The dieldrin also killed other insects, including flies and cockroaches living in the houses. At first the islanders applauded this turn of events, but then small lizards that also lived in the houses died after gorging themselves on the dieldrin-contaminated insects.

Next, cats began dying after feeding on the dead lizards. Then, in the absence of cats, rats flourished and overran the villages. Now that the people were threatened by plague carried by rat fleas, WHO parachuted healthy cats onto the island to help control the rats.

The villagers' roofs began to fall in. The dieldrin had killed wasps and other insects that fed on a type of caterpillar that either avoided or was not affected by the insecticide. With most of its predators eliminated, the caterpillar population exploded, munching its way through a favorite food: the leaves used in the thatched roofs. Ultimately, this episode ended happily: both the malaria and the unexpected effects of the spraying program were brought under control. Nevertheless, the chain of unforeseen events emphasizes the unpredicta - bility of interfering in an ecosystem.

*Source: G. Tyller Miller, Jr. 1996.*

**EVERY DECEMBER 3 IS INTERNATIONAL NO PESTICIDE USE DAY !**


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## Now, what should we do?


As individual citizens, we should be aware of the issues concerning synthetic (petroleum-based) pesticides and the hazardous effects they pose on our environment and us. With the appropriate knowledge about pesticides, we could become advocates for the proper control of pesticide production, usage, and the replacement of these agricultural inputs with natural ingredients.

Society as a whole should be united in waging a war against pesticides: a kind of war that would not kill, but save humanity and the rest of the environment. These are just some of the steps that we could take:

- Practice/promote diversified cropping (with natural pest-population check and balance system)
- Practice crop rotation, or planting of other crops after the harvest of a particular crop on the same area.
- Do not use internationally banned chemicals
- Support organically grown food and other products by patronizing them and sharing about their benefits to your friends.
- Urge/write the Department of Agriculture or FPA to ban all internationally banned chemicals especially paraquat and tridemorph; and to closely monitor the entry and use of other synthetic chemicals that are widely used in the country.
- Urge plantations to strictly implement buffer zones (from houses, roads, rivers and springs) to protect people and water resources from pesticide drifts.
- Urge plantations to strictly implement the use of personal protective equipment for all workers directly exposed to chemicals
- Report improper disposal of empty pesticide containers to your local government or you may write directly to the Fertilizer and Pesticide Authority (FPA, Department of Agriculture Building Bangoy St. Davao City).
- Support the call to ban aerial spraying in Davao City. Write to our Mayor and City Councilors.

## Pesticide Statistics

At least...
25 million people worldwide are poisoned by pesticides every year or 48 per minute.
14 million people in the US routinely drink water contaminated with carcinogenic herbicides.
806 pesticides were registered in the Philippines from 79 active ingredients
520 species of insects and mites have already developed genetic resistance to one or more pesticides
496 pesticides were identified as likely to leave residues in food but only 40% can be routinely detected by the regular tests of the Food and Drug Administration of the US.
400 pesticides on the market were registered before being tested if they caused cancer, birth defects or wildlife toxicity.
273 weed species have already developed genetic resistance to one or more pesticides.
150 plant diseases and 10 species of rodents, mostly rats have developed genetic resistance to one or more pesticides.
74 pesticides were documented in the US to be present in their ground waters.
17 species of insect pests that are resistant to all major class of insecticides (and several fungal plant diseases) are now immune to most of the widely used fungicides.

References: info@simplelife.com accessed 11/20/05
G. Tyler Miller, Jr. 1996



**Endnotes:**

1 *Fao.org/ag/AGP/AGPP/Pesticid/Events/n.htm*
*Organophosphate pesticides have replaced DDT as the leading pesticides because of their rapid breakdown into the environment. However, they have far more immediate toxicity than DDT and other related products. (www.krpc.com/proffed/op%5.Cop.cfm) accessed on 5/17/2005. Organophosphates affect the nervous system and would lead to over stimulating the nerves and muscles causing weakness or paralysis of muscles.*
2 *Dr. Marion Moses, Cancer in Children and Exposure to Pesticides, Summary of Selected Studies, Pesticide Education Center, San Francisco,*
3 *CA. May 1999, cited in Warning: Pesticides are Dangerous to your Health. PAN-AP. November 1999.*
4 *G. Tyler Miller, Jr. 1996. Living in the Environment 9th ed. Wadsworth Publishing Company. USA*
5 *Miller, 1996*
6 *There were 150 monitoring studies conducted by the US Environmental Protection Agency in 1988 to establish Groundwater Data Base*


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Watershed Issues In Brief

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# PESTICIDES and MONOCULTURE

## The Basics of Pesticides

### What are pesticides?

Pesticides are chemical mixtures or poisons primarily designed to kill, destroy, prevent, control and/or ward off pests. We usually mistake pesticides as chemicals only limited to kill insects but in fact, pesticides can also kill a wide range of living things - plants (herbicides), rats (rodenticides), fungus (fungicides), and nematodes or microscopic worms (nematocides).

Pesticides can also be classified according to their toxicity or their inherent ability to cause harmful effects. In the Philippines, the Fertilizer and Pesticide Authority (FPA) classified pesticide toxicity as follows:

| Category | Color of Label | Lethal oral and liquid dose for 60kg/person |
|---|---|---|
| I Danger-Poison | Red | Less than 1 Tbsp* |
| II Warning | Yellow | 1 Tbsp to 120 ml** |
| III Caution | Blue | 120 ml to 180 ml*** |
| IV | Green | More than 180 ml |

** Highly–toxic. A taste to a teaspoonful taken by mouth could kill an averaged-sized adult. Printed in red and accompanied by the skull and crossbones symbol*
*** Moderately toxic. A teaspoonful to a tablespoonful by mouth could kill the average-sized adult*
**** Slightly toxic. An ounce to more than 1 pint taken orally could kill the average-sized adult*

### How did the use of pesticides evolve?

History of pesticide use traces its source way back before 500 BC when humans applied sulfur (the first known pesticide), arsenic, mercury, and lead to kill pests and consequently prevent crop damage. Since then, the endeavor to search and manufacture pesticides never ceased. In the 17th century for example, nicotine sulfate extracted from tobacco was used as insecticide. In the 19th century, rotenone from legume roots was used as natural pesticides.

World War II gave birth to dichloro-diphenyl-trichloroethane, popularly known as DDT, the first modern and most famous pesticide. Discovered by Paul Hermann Miller, it initially served to combat malaria-spreading mosquitoes and other disease-carrying insects.

However, in 1962, American activist Rachel Carson published a book "Silent Spring", which elaborated the link between the use of DDT and cancer and its harm on bird reproduction, among other risks. The book resulted in a strong public protest that DDT was banned for agricultural use in many countries. But while DDT was banned, pesticide-use dramatically increased over fifty times since the 1950.

Organophosphate pesticides (OPs)) were developed during the early 19th century, but their effects on insects, which are similar to their effects on humans, were discovered in 1932. Some were used in World War II as nerve agent. Examples of OPs are chlorpyrifos, diazinon, malathion and profenofos.

The new formulations of pesticides although not as persistent in the environment as the first generation pesticides, are still designed to kill, destroy or ward off pests and hence are by nature harmful. The repetitive application of these pesticides makes them stay in the soil, air and water because before they are totally dissipated, new quantity is being poured again.

There are now at least 70, 000 different chemicals available in the world market today, and around 1, 500 new ones are introduced every year[1]. Majority of these have not passed through a thorough study especially on their effects to humans and after they combined with the other chemicals on the ground. Most of the studies on the health effects were done inside laboratories using animals. But laboratory condition is so different from the real world – where a lot of chemicals are present that may react with the other pesticides and causes synergistic impact. A synergistic impact is the resulting impact of the combined pesticides that is totally different from and greater than the impact of individual pesticide combined.

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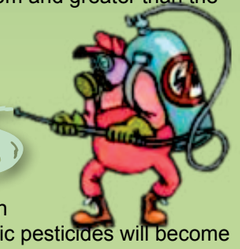
## What are the dangers of using pesticides?




### Pesticides benefit pests

http://www.powerlink.net/fen/images/herbicid.JPG

One of the major complications in pesticide use is the fact that pests or insects in general evolve and develop resistance to chemicals. Pests sprayed with synthetic pesticides will become susceptible or vary their genetic make-up, thus continue to survive and harm crops. Farmers usually react to this problem by increasing pesticide application, unaware of further complications.

Monoculture, a farming practice where only one kind of crop is grown, contributes much to the problems caused by pesticide use. Since there is only one kind of crop grown, pests of the same species naturally flourish in the farming area for access to food is abundant for such species. Greater pest population leads to better chances of evolution and resistance-development especially because almost always, monoculture farming requires the repeated use of few kinds of pesticide. The constant exposure of insects to the same pesticides over and over again makes them resistant to such chemicals that no matter how much will be poured on the field they will continue to survive and reproduce. The more people engage in monoculture and the larger the area devoted to just one crop, the need to use pesticides increases because the more pests flourish in this situation.

In contrast, diversified farming or the production of variety of crops is more ecologically friendly. It is more ecologically and economically stable than monoculture practice because if pests destroy one crop, the farmers won't end up with nothing. Growing a variety of crops hinders particular species of insects to dominate in the area. Different kinds of plants attract different kinds of insects, thus diversified farming facilitates an atmosphere where a certain degree of balance is achieved with regards to the population of insects.

### Pesticides harm humans instead

http://www.powerlink.net/fen/images/herbicid.JPG

Food crops exposed to too much pesticide contain pesticide residues that are harmful to humans. Recently, Philippine mangoes exported to Japan were sent back due to the presence of pesticide residue - chlorpyrifos (an organophosphate pesticide[2]). Not only does pesticide enter the human body through digestion (oral intake), there are three other main routes where pesticides penetrate the human body, namely; skin, eyes, or through inhalation. Penetration of pesticides to the body could lead to mild or severe poisoning or even death. Many people get exposed to pesticides without knowing it and don't recognize the symptoms of toxic exposure because usually they resemble flu-like symptoms such as cough, headache, fatigue, dizziness, and nausea. Pesticides also have delayed (chronic) effects, some of which are cancer, neurological damage and adverse effects on the reproductive health like sterility. Studies done in the US, Canada, and China show that children whose parents are occupationally exposed to pesticides have a two to eleven fold increased risk for leukemia[3].

**Seed extract from the neem tree plant can repel or stop more than 100 insect species from feeding on the treated plants without causing harm to pets and humans.**
**Neem tree's oil can disrupt 200 insect species by preventing them from reproducing.**


*Photo by Romy Quijano*

### Pesticides: a major threat to the environment and biodiversity

http://www.powerlink.net/fen/images/herbicid.JPG

Pesticides are not selective with their target. Given their inherent toxicity, pesticides are highly capable of harming the environment and all the organisms living in it. There are countless documented cases linking pesticide use with extinction or reduction of certain animal and plant population. Pesticides wiped out some 20% of US honeybee colonies and another 15% are damaged every year that resulted to reduced productivity of certain crops due to reduced pollination[4]. Likewise, pesticides do not simply stay in their area of application. Pesticide drifts--the movement of pesticides/pesticide residues from the target to non-target area-- have continually threatened living organisms.

Imagine a farm so heavily dependent on toxic pesticides- after application of pesticides, natural agents like air, soil and water will bring the pesticide down contaminating everything it will come in contact with. Pesticide running off from croplands is a leading cause of fishkills worldwide[5]. Pesticides can contaminate also our precious groundwater because some are soluble enough to move in the soil and percolate down to the aquifer. At least 68 kinds of pesticides were found in the drinking wells of California since 1982, affecting 957 wells. In 1988, 46 different pesticides were found in 26 States due to agricultural activities[6]. One of the conclusions of the US monitoring program is that at least 1 pesticide is present in 10,000 public community wells and in 446,000 private wells. The same trend may have happened in other parts of the world but because of the absence of monitoring program will remain unreported.

## What is the role of government regarding pesticide use?

The law requires that all materials for sale and use as pesticides be registered with the Fertilizer and Pesticide Authority (FPA). However, manufacturers are not required to name all the ingredients of a particular pesticide. These unnamed contents are labeled "inert ingredients" as part of the pesticide-makers' trade secrets. With this practice, there is no way for the government to accurately classify pesticides and their toxicity levels. As an attached agency to the Department of Agriculture, the FPA is mandated, among others, to protect the public from the risks inherent in the use of pesticides, educate the agricultural sector in the use of these inputs, establish and impose appropriate penalties on handlers of these products for violations of any rules and regulations, and restrict or ban the use of formulation of any pesticide.

The government should strictly enforce the laws that they have enacted on pesticides and promulgate new ones that will allow them to properly check the harmful components of the pesticides under the guise of "inert or other ingredients". But the FPA lacks the personnel to effectively perform all the tasks expected of them. In fact, there are only three (3) personnel in Davao despite the fact that pesticide dependent-plantations proliferate in the City.

The continuous introduction of many new chemicals every year poses a major challenge to many governments that must monitor and manage these dangerous substances. Many pesticides that have been banned or whose use has been severely restricted in industrialized countries are still marketed and used in developing countries where regulatory controls are less stringent and weakly enforced.

**The Pesticide Action Network (PAN) International's List of "Dirty Dozen" pesticides now includes 18 highly toxic chemicals, they are as follows:**
***aldicarb (Temik), aldrin, chlordane, chlordimeform, dieldrin, heptachlor, camphechlor (Toxaphene), DBCP, DDT, endrin, EDB, HCH/BHC, lindane, paraquat, parathion, methyl parathion, pentachlorophenol, 2,4,5-T.***