

# bantay kinaiyahan

**Every December 3  
is commemorated  
around the world as**

**“NO  
PESTICIDE-USE  
DAY”**



**“On December 3, 1984, Union Carbide’s pesticide-manufacturing plant in Bhopal, India leaked 42 tons of the deadly gas methyl isocyanate into a sleeping, impoverished community -- killing more than 2,500 people in the first night of the disaster and injuring up to 200,000 others.**

**“According to some estimates, more than 16,000 people have died since that time as a result of medical problems related to their exposures; 50,000 people are still suffering significant long term health impacts and over 500,000 people have filed injury claims with the Bhopal Compensation Courts.**

**“Union Carbide has since abandoned its Bhopal plant and has refused to clean up the extensive pollution of water and soil it left behind.**

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### Is aerial spraying vital to the export-earning banana industry?

It has been argued that banning aerial spraying would result to the death of the export-earning banana industry. However, available alternatives may have yet been explored in favor of dependence on chemical sprays.

In November 2001, export-plantation province Bukidnonpassed Provincial Ordinance 2001-4R, banning the use of aerial spraying in all banana and other agricultural plantations in the province. Four years after the ordinance has been passed, banana plantations in Bukidnon continue to thrive, with alternative pest control methods presumably being maximized.

## Why should I be concerned?

The act of releasing toxic chemicals in the air through pesticide aerial spraying is undeniably compromising the safety of people and the environment, not only in the immediate vicinity where aerial spraying happens but also beyond.

In Davao City, pesticide-using plantations have been encroaching on vital upland watersheds. The recent Davao River Situational Report, in fact, recognizes pollution caused by pesticide run-off as one of key problems in the Davao River Watershed<sup>19</sup>. These contaminated waters may actually end up unknowingly in people’s drinking water as what happened in the US in the 1990s where one out of every 10 public drinking water wells contained pesticides<sup>20</sup>.

Communities around plantations where aerial spraying happen have nowhere to run to and are in fact situated there because of lack of economic choices. Aerial spraying is tantamount to dousing them and their limited livelihood sources with poison. In the process, this continuing lack of respect for peoples and the environment (which causes small and large shifts in functioning potential of people and natural resources) ultimately translates to adverse economic and social consequences.

## What can be done?

- While embarking on sustained campaigns for the eradication of synthetic chemical pesticide use, IDIS offers some pragmatic advocacies that you can adopt:
- Support the call to ban aerial spraying in Davao City. Write to our Mayor and City Councilors.
  - 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).

**Endnotes**

<sup>1</sup> “Group fears breakout of diseases in Tamayong” by Ben O. Tesiora. Sunstar Davao, 30 August 2005.

<sup>2</sup> Quijano, Dr. Romeo and Ilang-ilang Quijano, Kamukhaan: A Village Poisoned. Global Pesticide Campaigner (Volume 09, Number 3), December 1999.

<sup>3</sup> Ibid

<sup>4</sup> U.S. Congress Office of Technology Assessment 1990. www.seacc.org, accessed 20, May 2005;

<sup>5</sup> Estimates. EARTH College (Escuela de Agricultrude la Region Tropical Humeda) as cited in De Leon and Escobido. The Banana Export Industry and Agrarian Reform, 2004.

<sup>6</sup> U.S. Congress Office of Technology Assessment 1990.; G. Tyler Miller, 1996. Living in the Environment 9th Ed. Wadsworth Publishing Company: USA

<sup>7</sup> ohioline.osu.edu/b816/images/b816\_2.jpg

<sup>8</sup> www.envirohealthaction.org/upload\_files/fungicides.pdf

<sup>9</sup> Quijano, Dr. Romeo and Ilang-ilang Quijano, Kamukhaan: A Village Poisoned. Global Pesticide Campaigner (Volume 09, Number 3), December 1999.

<sup>10</sup> “Health Effects Of Pesticides On The Village Of Kamukhaan.” Report Of The Medical Team International Fact-Finding Mission To Kamukhaan, February 25, 2003. Digos, Davao Del Sur, Philippines by Rodney Hernandez, M.D., Gene Alzona Nisperos, M.D. And Pamela Claveria M.D.

<sup>11</sup> Controlling pests, FAO. <<http://www.fao.org/docrep/u8480e/U8480E0j.htm>>

<sup>12</sup> Tabien, C. 2000. Local government response to the potential environmental impacts of commercial farms on the water resources of Lantapan, Bukidnon. Master of Management (Development Management) field study report. University of the Philippines Los Baños, College, Laguna.

<sup>13</sup> Steingraber, 1997 as cited by Jill Gay in Feminism, Environmental Justice, Toxic Dumps and Pesticides. www.cwpe.org/issues/environment\_html/gay.html May 20, 2005

<sup>14</sup> As cited in PAN UK briefing paper, October 2002.

<sup>15</sup> Forastieri V. Safe Work, the ILO Programme on Occupational Safety and Health in Agriculture, ILO, Geneva, October 1999.

<sup>16</sup> U.S. EPA, Office of the Inspector General, Inert Ingredients Of Pesticides. September 27, 1991.

<sup>17</sup> Cox, Caroline. Inert Ingredients in Pesticides: Who’s Keeping Secrets. Journal of Pesticide Reform 1999, Volume 19, No. 3

<sup>18</sup> www.beyondpesticides.org

<sup>19</sup> Davao River Watershed Primer 3rd Edition, 2004. Davao River Conservation Coordinating Committee and Catholic Relief Services.

<sup>20</sup> Cited in The Bug Stops Here by Stephen L. Tvedten. <http://www.thebestcontrol.com>, accessed 10/8/05.

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# bantay kinaiyahan

Watershed Issues In Brief

Bantay Kinaiyahan is a regular publication of Interface Development Interventions, Inc. to provide the public with relevant and concise information on pressing watershed issues

## THE STORY OF TOXIC SHOWER

(Aerial Spraying of Pesticides)

The sound of low-flying planes, accompanied by a yellow mist, always send people scampering for cover.

“We really have to run to safety because we don’t want to be sprinkled with poison...if we do not hide then we will get the chemicals.”

“...the villagers cannot escape the fumes, not even in their homes. Their eyes sting and their skin itch. Many experience feelings of suffocation, weakness and nausea<sup>2</sup>.

“Children playing in the street come in, coughing and complaining that their eyes hurt,” says Alona, 31. “The airplanes pass over our streets, and even when it’s far away, the pesticide fumes still reach inside our houses<sup>3</sup>.”

The low-flying planes are crop dusters piloted by company-trained and government- certified pesticide applicators, spraying fungicides to hectares of banana plantations in Southern Mindanao. Aerial spraying ensures blemish-free, export-quality bananas, with maximum pest-control coverage at the least amount of time.

### What is aerial spraying?

Aerial spraying, also referred to as aerial application or crop dusting, is a type of pesticide application involving the spraying of crops from an agricultural aircraft, usually a small airplane or sometimes a helicopter.

Aerial spraying is differentiated from ground application, where pesticides are applied either directly on soil and/or crop manually or using various ground equipment such as motorized or hand-operated sprayers, backpack sprayers, boom sprayers and air-blast sprayers. Aerial spraying is used only in large farm areas and is preferred due to uniform and apparent efficient coverage in terms of area per unit of time, or in cases where ground spray equipment cannot operate because of farm layout or slope.

Pesticide application varies according to each type and formulation, as well as according to the pests they control. Herbicides control weeds and other unwanted plants; fungicides kill fungi including mildews, molds, mushrooms and plant rusts; rodenticides kill rodents; and insecticides kill and drive-away insects considered harmful to humans or crops.

### Are all pesticides allowed to be sprayed aerially?

Laws and regulations on aerial spraying differ across countries and localities.

In the Philippines, the Fertilizer and Pesticide Authority (FPA) allow only fungicides to be applied aerially. In Mindanao, aerial spraying is done in large tracts of export banana plantations primarily to control the Sigatoka disease, considered the most serious pest threat to banana production. The Sigatoka disease is caused by a fungus that makes banana leaves wither prematurely, thus affecting the development of the banana bunches.

In Davao City, aerial spraying happens in barangays Mandug, Tamayong, Manuel Guianga, Subasta and Dacudao



Are there safe or environment-friendly pesticides?

As far as synthetic chemical pesticides are concerned, it is difficult to say. Pesticides have a history of being phased out of use after several years on the market, confirming that pesticides are being sold without prior adequate testing for their potential impacts on health. Banned pesticides today were once declared safe for use.

And while new pesticides released in the market today may be less persistent in the environment, the shorter half-life\* becomes ineffective in the face of too frequent pesticide application, particularly in plantations.

“...even when pesticides are applied according to label directions by professional, well-trained applicators with proper oversight by authorities, these synthetic chemical products still carry out their mission. They are toxic. They do what toxins do. Synthetic chemical pesticides are designed to cause injury and death. That’s just what toxins do. (Pesticide Action Network)

\* Half-life is defined as the time (days, weeks or years) required for half of the pesticide present after an application to breakdown into degradation products. The rate of pesticide breakdown depends on temperature, soil acidity, micro-organisms in the soil, exposure to light, water and oxygen. Many of the breakdown products themselves are toxic and may have different half lives as well. (www.pesticideinfo.org/Docs/ref/waterair.html)

Is the practice of aerial spraying safe?

It depends on whose point of view is taken.

Banana plantation companies maintain that the pesticides they use are legally procured and that government sanctions its safe use in agriculture. Fungicides being sprayed aerially are handled only by certified pesticide applicators who have undergone corresponding training. Company manuals detail safety protocols and measures. Government and industry regulating bodies abide by their mandate.

Even chemical pesticide manufacturers and distributors, while acknowledging potential hazards of their products, provide safety information and precautionary measures in application and handling as a guarantee to safe use.

However, various studies and anecdotal evidence culled from actual experiences on the field point to the contrary.

Dangerous Drift

Pesticides sprayed do not stay put. Pesticides in the air can drift up to 3 kilometers or more from the treatment site<sup>4</sup>, contaminating soil, open bodies of water, and other animal and human environs in the process.

Studies in banana producing countries show that of the fungicides applied through air, about 40 times during each cultivation cycle, 15 % is lost to wind drift and falls outside of the plantation, 40% ends up on the soil rather than on the plants, and about 35% is washed off by rain, totaling to a 90% loss<sup>5</sup>.

In the US, estimate for pesticides in general is even lower at 1-2% of sprayed chemicals actually reaching the target pests. Aerial drift is also estimated at 5% under optimal low wind condition to 60% under more typical winds<sup>6</sup>.

Aside from the airborne drift associated with the physical movement of the droplets of pesticides sprayed, drift may also occur even days after spraying is done. Referred to as Vapor drift, it is commonly associated with the volatilization of pesticides, or the physical change of liquid pesticides into vapor or gas<sup>7</sup>.

Second-hand Poison

Environmental exposures to fungicides usually involve relatively low concentrations that may occur over long periods of time. While the human health effects associated with chronic (long-term), low-level pesticide exposures are not yet well understood, a growing body of scientific evidence suggests that environmental pesticide exposures are associated with neurological and reproductive damage, effects on growth and development, birth defects, endocrine disruption, cancer, and other adverse effects<sup>8</sup>.

In 1999, toxicologist Dr. Romeo Quijano and daughter Ilang-ilang published a study (Kamukhaan: A Village Poisoned<sup>9</sup>) documenting the effects of 19 years of regular ground and aerial spraying on a small community near a banana plantation in Kamukhaan, Davao del Sur. The initial study and consequent international fact finding missions confirmed significant health impact to both children and adults, as well as to farm animals. Contaminated soil and water were also attributed to the spraying of chemicals.

While the major causes of diseases were communicable and typical in poor, rural Filipino communities, some atypical patterns were also reported<sup>10</sup> which were consistent with independent studies documenting health impacts from pesticide exposure.

- An unusually significant number of adult males showed signs and symptoms of anemia and possible blood dyscrasias;
- A significant number of males and females exhibited signs and symptoms of tremors and palpitations suggestive of endocrine disruption;
- A considerable number of children showed developmental delays including stunting, wasting, delays in the development of secondary sexual characteristics, and mental deficiencies.

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List of Fungicides used by Banana Plantation Companies in Mindanao/a

Active Ingredient	Product/Brand Name	Documented Health Effects/b
Azoxystrobin	Bankit 250 EC	Highly toxic to fish and aquatic invertebrates; not allowed for use in Canada
Biterthanol	Baycor 300 EC	Possible source of birth defects; not allowed for use in US farms
Propiconazole	Bumper 250 EC	Possibly carcinogenic/ cancer-causing; contains reproductive toxins
Tridemorph	Calixin 750 EC	Causes birth defects; not allowed for use in Canada
Chlorotalonil /c	Daconil 720 F	Carcinogenic; highly toxic to fish and aquatic invertebrates; it builds up in fish
Mancozeb (commonly used in aerial spraying)	Dithane 448 F	Carcinogenic; contains reproductive toxins; may cause birth defects; suspected to disrupt endocrine functions
Maneb	Maneb 80 WP	Causes birth defects; probable source of carcinogens; potential source of reproductive toxins
Diteconazole	Sico 250 EC	Possibly carcinogenic; contains reproductive toxins
Propiconazole	Tilt 250 EC	
Mancozeb	Vondozeb Plus 80 WP	Potential cause of birth defects
Thiophanate Methyl	Topsin M 70 WP	Very highly toxic to catfish; toxic to earthworms; causes damage to the thyroid gland, producing hyperthyroidism

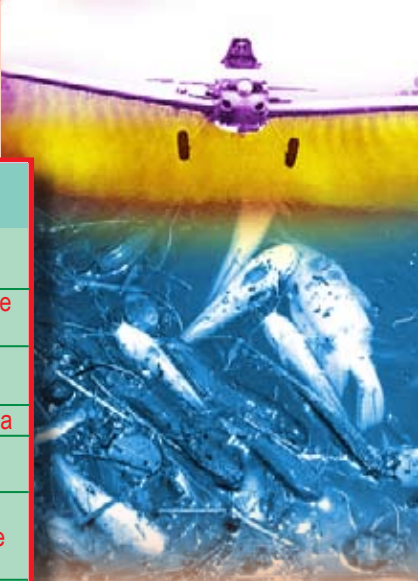
/a Taken from a Position Paper prepared by the Pilipino Banan Growers and Exporters Association, Inc. (PBGEA) and Davao Agricultural Ventures Corporation (DAVCO), submitted to the Joint Committees of Environment and Agriculture. Davao City Council. February 4, 2004.

/b Culled from the United States Environmental Protection Agency; the Advisory Committee on Pesticides in UK; www.pesticideinfo.org; Pesticides News No. 48 June 2000; extoxnet.orst.edu/pips/maneb.htm; Gallagher & McWhirter, Chiquita Secrets Revealed, Cincinnati Enquirer 3 May 1998; http://infoventures.com/e-hlth/pesticide

/c Chlorothalonil contains hexachlorobenzene and pentachlorobenzonitrile as manufacturing impurities; Hexachlorobenzene has been classified as a carcinogen, a mutagen and a reproductive hazard. http://infoventures.com/e-hlth/pesticide/chloroth.html

What are the issues against the use of pesticides?

- With continuous application of pesticides, target pests are developing resistance to the chemicals, causing more often and greater amounts of pesticide application. FAO estimates that at least 520 species of insects and mites, 150 plant diseases, and 113 weeds have become resistant to pesticides meant to control them.<sup>11</sup>
- Soil damage from rampant chemical fertilizer and pesticide application, usually in monocrop farms, have also been observed. In Davao, for instance, soil analysts report that intensive land cultivation and overuse of chemicals have damaged lands planted to banana that companies are now on the lookout for expansion areas since existing plantations have been less productive over the years.<sup>12</sup>
- The cycle of dependence on synthetic chemical pesticides, as well as fertilizers, cause continued increase in input costs without necessarily increasing yield in corresponding amounts.
- Technically, chemical pesticides are designed to kill living things, it has life threatening impacts on people and the environment. According to the US National Research Council, only 10% of pesticides in common use have been adequately assessed for hazards.<sup>13</sup>
- Acute toxicity is measured by lethal concentrations in air, lethal dose from exposure either orally or through the skin, and effective concentration that produces sub-lethal responses such as immobilization and loss of equilibrium/balance.
- Chronic toxicity or delayed effects can occur months or years after exposure, and may even develop from low levels of exposure over a long period of time. Three major chronic effects associated with pesticides are cancer, neurological damage, and adverse effects on the reproductive system.
  - According to World Health Organization estimates, 20,000 unintentional deaths and 25 million poisonings happen every year due to pesticides.
  - Beyond the reported acute cases, there is increasing evidence over pesticides that mimic natural hormones (known as endocrine disruptors), possibly causing adverse effects on specific body organs and systems, including reduction in male sperm count and undescended testes as well as increasing incidences of breast cancer.<sup>14</sup>
  - In 2000, ILO studies suggest that pesticides cause 14% of occupational injuries in the agricultural sector and 10% of fatalities in many countries.<sup>15</sup>



What are pesticides made of?

A pesticide formulation is a mixture of active and other (also called inert) ingredients, as well as metabolites, contaminants and impurities.

Active ingredients are the biologically and chemically active substances – usually the only component identified in the pesticide labels - that prevent, kill or repel pests.

Contaminants and impurities are responsible for product hazards, which have not been purposely added but are a result of the production process. Metabolites are breakdown products that are often more hazardous than the parent pesticide. It is formed when the pesticide mixes with air, water, soil or living organisms.

Those referred to, as other ingredients are the substances added to aid in the application of the active ingredient or to facilitate its effectiveness. These are also misleadingly referred to as inert ingredients, which are often considered as manufacturer’s trade secrets and thus, unidentified.

There is a significant lack of toxicological information about inert ingredients. Of the 1,820 inerts currently in use, the toxicity of approximately 1,350 remains unknown<sup>16</sup>. However, the Journal of Pesticide Reform<sup>17</sup> reports that despite minimal testing, many so-called inerts are actually hazardous.

According to reports, 72% of pesticide products available to consumers contain over 95% inert ingredients and fewer than 10% of products list any inert ingredients on their labels. Moreover, more than 200 chemicals used as inerts are actually identified air and water pollutants, and some 400 inert chemicals are actually used as active ingredients in other pesticide products.<sup>18</sup>