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Telephone (808) 241-4188
Fax (808) 241-6349
Email cokcouncil@kauai.gov

Council Services Division
4396 Rice Street, Suite 209
Līhu'e, Kaua'i, Hawai'i 96766

March 27, 2013

TESTIMONY OF GARY L. HOOSER
COUNCILMEMBER, KAUA'I COUNTY COUNCIL
ON
H.B. NO. 673, H.D. 2, SD1, RELATING TO PESTICIDES
Committee on Ways and Means
Thursday, March 28, 2013
9:05 a.m.
Conference Room 211

Dear Chair Ige and Committee Members:

Thank you for this opportunity to submit testimony for H.B. No. 673, H.D. 2, S.D. 1, Relating to Pesticides. My testimony is submitted in my capacity as an individual member of the Kaua'i County Council.

I am testifying in STRONG SUPPORT WITH AMENDMENTS.

People on Kaua'i are getting sick, and many believe their sickness is connected to the pesticide being sprayed daily by the large industrial agrochemical farming operations doing business on Kaua'i.

As an elected member of the Kaua'i County Council, I asked these companies directly and in writing on January 8th to please inform me as to what chemicals and what quantities they are spraying.

I assumed that it was reasonable to expect that the companies spraying the poison would know what poisons and how much of the poisons they were spraying.

To date, however, these companies have refused to provide me with this basic information, and instead have told me blithely to go elsewhere for the data. They suggest I get the data from the Department of Agriculture (DOA) and/or from the companies who sell these pesticides.

I have requested pesticide data from the DOA and have been told essentially that the data is not readily or easily available, that I will have to pay for the research needed, and that it will take some time to sort through the data appropriately.

The DOA has also informed me that these agrochemical companies have been issued "experimental pesticide permits," and that this data may not be available. If so, it may be heavily redacted.

The law requires them to keep records, yet they refuse to disclose those records.

Kaua'i is ground zero for the agrochemical industry. These industrial farming operations dominate the landscape of Kaua'i's West Side, utilizing approximately 12,000 acres of prime farmland, stretching from the base of the mountains down to within just feet of the pristine ocean waters.

12,000 acres of prime agricultural lands dedicated to experimental genetically modified crops, subject to spraying with toxic pesticides up to six (6) days a week, these companies refuse to provide the basic information, a simple list of the chemicals and the quantity being applied.

Over 200 residents of Waimea Valley have filed suit claiming negative impacts from pesticide laden dust blowing into their homes and onto their bodies. Biologists estimate over 50,000 sea urchins died last year in near shore West Side waters. People in all parts of Kaua'i County are growing increasingly concerned about the impacts that result from these companies spraying their fields with toxic and experimental chemicals that then flow into streams and near shore waters and cling to the dust which blows daily into neighborhoods and schools.

Three (3) of the four (4) companies on Kaua'i lease public lands from the State, but refuse to disclose to the public what they are spraying on these public lands.

Using experimental pesticides and spraying a wide array of restricted and non restricted pesticides on a mass scale have impacts on our island, our health and our environment. There are direct impacts, secondary impacts and cumulative impacts but we don't know what those impacts are because they have never been properly evaluated. The companies in question won't even give us the information needed to make a proper assessment.

SUGGESTED AMENDMENTS

I urge this committee to amend H.B. No. 673, H.D. 2, S.D. 1 to include in the disclosure posting the following requirements:

- Name of chemical/pesticide;
- Quantity of chemical/pesticide used;
- Entity/Company who is purchasing and applying the chemical/pesticide;

- Geographical location of the pesticide application site;
- Right of adjacent land owners and residents to request same disclosure information and receive response within forty-eight (48) hours of any pesticide application.

Please, pass into law this year something that is meaningful. The industry will tell you more time is needed to study the issue. The DOA will tell you they don't have the staff and resources to implement a new law. The people on Kaua'i and around the State will tell you, enough already. This Legislature has been talking about the pesticide issue for years now. People are getting sick.

For the reasons stated above I respectfully request your support for this measure as amended. Again, thank you for this opportunity to submit testimony.

Sincerely,

GARY L. HOOSER
Councilmember, Kaua'i County Council

AB:cy

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March 27, 2013

TESTIMONY OF TIM BYNUM
COUNCILMEMBER, KAUA'I COUNTY COUNCIL
ON
H.B. 673, H.D. 2, S.D. 1, RELATING TO PESTICIDES
Committee on Ways and Means
Thursday, March 28, 2013
9:05 a.m.
Conference room 211

Dear Chair Ige and Committee Members:

Thank you for this opportunity to submit testimony in strong support with amendments of H.B. No. 673, H.D. 2, S.D. 1, Relating to Pesticides. My testimony is submitted in my capacity as an individual member of the Kaua'i County Council.

Citizens on Kaua'i, especially on the Westside, have expressed great concerns regarding the pesticide activities conducted by seed companies who are using a large portion of the former sugar lands on our island. Many claim that the pesticides exposure is affecting the health and wellness of community members in these areas. In 2011, Kaua'i Representative Dee Morikawa and then Kaua'i Representative Mina Morita introduced a very similarly bill (H.B. No. 1387), which did not receive serious consideration.

I am extremely disappointed that the amendment made to the original bill stripped the bill of virtually all of its meaning provisions. Please reinstate provisions that will provide information to identify the different trends of pesticide use, and may bring clarity to community concerns regarding potential health and safety issues caused by pesticide exposure. Our Community deserves the transparency that they original bill proposed.

For the reasons stated above respectfully request your support for this measure. Again, thank you for this opportunity to submit testimony in support of H.B. No. 673, H.D. 2, S.D. 1.

Sincerely,

TIM BYNUM
Councilmember, Kaua'i County Council

From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: konachama@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:01:07 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Chama Cascade	Hawai'i Oasis	Support	No

Comments:

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: legechair@gmail.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 11:31:22 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Simon Russell	Hawaii Farmer's Union United	Support	No

Comments: Aloha Kakou Honorable Senators, Hawaii Farmer's Union United strongly supports the DOA having an publicly accessible online database of where the chemicals in Hawaii are being sprayed.

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HAWAII PEST CONTROL ASSOCIATION

Century Square – 1188 Bishop St., Ste. 1003*Honolulu, HI 96813-3304
Telephone (808) 533-6404 • Fax (808) 533-2739

March 28, 2013

Comments To: Senate Committee on Ways and Means
Senator David Y. Ige, Chair

Presented By: Tim Lyons, CAE
Executive Director

Subject: H.B. 673, HD 2, SD 1 - Relating to Pesticides.

Chair Ige and Members of the Committee:

I am Tim Lyons, Executive Director of the Hawaii Pest Control Association and we can support this bill.

We understand the need for the right to know policies and although we are not certain it belongs in the statutes, we have no problem with the manner in which this is accomplished through the passage of this bill.

Based on the above, we have no objections.

Thank you.

From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: ofstone@aol.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 10:18:38 AM
Attachments: gfk.hector.2013.update.PesticidesKauaiHV12.pdf

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Jeri Di Pietro	Hawai`i SEED and GMO Free Kaua`i	Support	No

Comments: Aloha Ways and Means Committee members, Please support the creation of a pesticide registry system. The open air field testing of genetically engineered crops have been going on for over ten years without any disclosure and no right to know the location or true nature of the experiments. We do know that the crops are being altered to included herbicide resistance genes and their own insecticde production. Communities and citizens deserve this information so that they can take appropriate precaution, especially if they have young children, are expectant moms or have compromised immune systems or breathing difficulties. Even the first responders do not know what chemicals are present at the mixing sites. The lack of transparency is alarming and should make residents and visitors concerned. For the protection of our environment, economy and future generations, please begin the process of disclosure. We deserve the right to know what is blowing in the wind. Much mahalo and aloha `aina, Jeri Di Pietro 808 651 1332

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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Environmental and Health Risks of Synthetic Chemicals used by the Biotechnology Seed Industry in Hawaii

Héctor Valenzuela
University of Hawaii at Manoa
College of Tropical Agriculture and Human Resources
Dept. of Plant Environmental and Protection Sciences
contact: hector@hawaii.edu

DRAFT 2.0: February 24, 2012

Note: Feedback, comments, and notes from additional research on the particular chemical products listed on Section 5.0. would be appreciated. Please send comments or references to: hector@hawaii.edu

A pdf version of this document can be downloaded from:
http://dl.dropbox.com/u/33544971/PesticidesKauaiHV12.pdf

this doc can also be accessed from google docs at:
https://docs.google.com/document/d/1FrgfwqSlAmxhUbz-2JvhWZwSwOZSOM7RKpxnY3NSgI0/edit

GMO fields in Kauai, fallow fields exposed to erosion (l), and pristine and sensitive aquatic habitats (r), down slope and in close-proximity to the annual planting of GM Seed crops in Kauai. GM seed crops are sprayed with pesticides almost 7 out of every10 days.

Environmental and Health Risks of Synthetic Chemicals used by the Biotechnology Seed Industry in Hawaii

Index

1.0. Introduction

The recent lawsuit filed by community members in Kauai against Pioneer/DuPont (Civil Complaint No. 11-1-0356, Dec. 13, 2011) claiming pollution of the Waimea community from their Genetically Modified (GM) seed crop experimental fields raised an issue that has not been widely discussed when talking about the potential environmental and human health risks from the planting of experimental genetically modified (GM) seed crops in Hawaii.

Nevertheless the use of synthetic pesticides and fertilizers and potential runoff from fallow fields is an integral part of the production of GM Seed Crops in Hawaii, and should be included as part of the overall risk assessment in terms of potential social, environmental, or human health risks.

It should be noted that official government reports that assess the value of the industry, do not take into account actual or potential costs of the GM seed industry, from environmental pollution. For instance, a 50 page industry report on the economic value of the GM seed industry in Hawaii does not account for any potential short- or long-term costs of environmental pollution, or human health effects (Loudat and Kasturi, 2009). These economic reports, sponsored by the GM Seed Industry, are apparently taken at face value by the government to report the economic value of the GM seed industry in Hawaii.

Below (Section 3.0.), is a brief description of the issues raised by the lawsuit against Pioneer Seed/Dupont in Kauai, followed by a list of scientific studies (Section 4.0.) that have documented some of the phenomena that may lead to pollution of non-target areas from wind erosion and from the use of pesticides in agriculture.

References from the scientific literature are provided to show that there is a scientific basis for some of the key complaints raised by the Waimea Community in Kauai, concerning possible pollution of rural communities by pesticides, dust, and Bt pollen from neighboring GM agricultural operations.

2.0. Previous Incidents of Pesticide Pollution in Agriculture

One doesn't have to look too far to find previous cases of pesticide pollution, chemical-trespassing and contamination. A few cases are listed below, to illustrate that an extensive track record exists of pesticide and chemical contamination of non-target areas from the use of synthetic chemicals in industrial or conventional agricultural systems:

- **Dow Chemical Company** (major GM seed company in Hawaii). April 1977, accidental spill, 495 gallons of the soil fumigant EDB containing 0.25 percent DBCP, occurred about 60 feet of the Kunia Well in Oahu. From 1946 to 1980 the well supplied water to 700 residents of Kunia Village and irrigation water to Del Monte plantations. "The spill resulted from the failure of a hose connector on a bulk transport container owned by Dow Chemical Company during transfer operations to an above ground storage tank."

By 2003, 26 years later, the EPA reports that “a substantial threat of release to groundwater still exists” (EPA, 2003).

- **Heptachlor, Hawaii**. The entire population of Oahu (approx. 800,000) was exposed to heptachlor contaminated milk during the early 1980s, after dairy cows were fed greenchop containing heptachlor residues. It was estimated that dairy products contained 15 times the acceptable levels of pesticides for adults; and children may have been exposed to greater levels than adults. Heptachlor was also detected in mother’s milk and in infant formula. According to an account from the University of California, “One of the more disturbing aspects of this episode is the evident hesitance of state authorities to disclose information before the public became aware of the possibility of contamination.” In addition, “The state's Senate Committee on Health criticized the Department of Health for delaying the release of information to consumers” (Foster and Just, 1984). Contaminated agricultural soils continued to show unhealthy levels of heptachlor and heptachlor epoxide, 15 years after its use had been discontinued (Frazar/EPA, 2000).
- **Dupont (parent of Pioneer Seed, major GM seed company in Hawaii) and Benlate**. During the 1990s hundreds of farmers and greenhouse operators from the United States, Hawaii, Asia, the Caribbean and Central America suffered substantial losses, and claimed several health side-effects, from the use and exposure to the fungicide Benlate (Benomyl), after it was apparently contaminated with a herbicide-like contaminant during the manufacturing process. According to a media account of the lawsuits, “During the course of the Benlate litigation, at least three judges took the company to task for withholding evidence from plaintiffs. One judge called the practice "willful, deliberate, conscious, purposeful, deceitful, and in bad faith," and DuPont was ordered to pay millions in court sanctions.”

  A separate court proceedings stated that “In addition, because the circuit court found that DuPont had engaged in serious discovery violations, it imposed sanctions of $1.5 million payable to the State of Hawai'i.” Furthermore, according to this document “the circuit court found, inter alia, that some of "DuPont's representations to this court . . . were false and misleading" and that "DuPont intentionally withheld . . . crucial information in an effort to prevent the disclosure to the [Kawamata Farms] plaintiffs and this [c]ourt of Benlate and soil contamination data [(i.e., the Alta test results)] disclosed in said documents which goes to the heart of this case." Moreover, the court amended several orders that it had previously entered because such orders "were based on misleading, incomplete, inaccurate and false information." The court then sanctioned DuPont by ordering it to pay for the Kawamata Farms plaintiffs' attorneys' fees and costs” (Matsura et al., 2007).

3.0. Environmental Issues raised by the lawsuit against DuPont/Pioneer Seed in Kauai

Note: This section (Section 3.0.) summarizes some of the complaints raised by the Waimea community against Pioneer Seed, as described in the 2011 lawsuit (Civil Complaint No. 11-1-0356, Dec. 13, 2011) . In the following section (Section 4.0.), scientific references are provided that document similar phenomena to those issues raised in the Kauai complaint, concerning dust or pesticide pollution, as documented from surveys conducted in other locations.

3.1. Erosion and fugitive dust

From the claim:

“Because of Waimea's persistent windy conditions and Pioneer's failure to control soil erosion, fugitive dust from Pioneer's GMO Test Fields routinely blows into the Waimea community and Waimea Residents' homes.”

3.2. Pesticides intensive use and escape

From the claim:

“"For example, Pioneer has applied pesticides individually and in combination to its GMO Test Fields roughly 67% of all days of the year for at least the past three years."

and:

"Pioneer's pesticides pose a recognized hazard to migrate into the adjacent Waimea community and environment by the widely recognized transport mechanisms of run-off, volatilization drift, and spray drift."

3.3. Use of restricted-use pesticides

From the claim:

"Restricted use pesticides are pesticides that may cause unreasonably adverse effects to human health and the environment even when used as directed by the product labeling."

3.4. Pesticide Drift from fugitive dust

From the claim:
“"Pioneer's fugitive dust exacerbates the risks associated with Pioneer's use of inherently dangerous pesticides because fugitive dust acts as a transport mechanism to carry pesticides into Waimea."

3.5. Failure to follow county and state pollution control laws

According to the complaint:
“Pioneer's failure to satisfy its obligations under Ordinance 808, failure to implement its 2002 Conservation Plan, and failure to undertake measures promised in response to the Waimea Petition in 2000 all demonstrate Pioneer's failure to follow generally accepted agricultural and management practices.”

And with regards to state law, according to the complaint:
“Pioneer's failure to satisfy its obligations under Kauai Ordinance 808, implement measures promised within its Conservation Plan, adequately respond to Waimea Residents' June 2000 petition, and otherwise prevent the ongoing creation and deposition of fugitive dust from its GMO operation for over a decade demonstrates Pioneer's failure to reasonably minimize fugitive dust and constitute violations of the Hawaii Air Pollution Control Act."

3.6. Hawaii Pesticide Law, Hawaii Revised Statute 149A-2

According to this complaint:
“Hawaii Revised Statute 149A-2 prohibits the use of pesticides in any manner that presents an unreasonable adverse effect on the environment, which includes any unreasonable risk to humans or the environment with consideration for the economic, social and environmental costs and benefits of the pesticide's use.”

And thus according to the complaint, per Hawaii law:
“Pioneer's intentional use of inherently dangerous pesticides without consideration of the risks to Waimea Residents violates HRS 149A-2 and constitutes negligence per se under Hawaii law.”

3.7. Fugitive dust and Hawaii Law

According to the complaint:
“"Under the Hawaii Air Pollution Control Act, fugitive dust is the "uncontrolled emission of solid airborne particulate matter from any source other than combustion.“

And, according to the complaint, in terms of prevention:
“"Reasonable precautions" under HAC § 11-60.1-33 for agricultural operations requires operations to be conducted "in such a manner as to reasonably minimize fugitive dust.”"

3.8. Trespass of chemicals and dust

According to the complaint,
"Pioneer is therefore liable for the trespass of its chemicals and fugitive dust into the Waimea community and onto Waimea Residents' property."

4.0. Scientific studies have documented phenomena that leads to environmental pollution from the use of pesticides in agriculture

4.1. Wind Erosion

- Wind erosion is a well established phenomenon in agriculture, and thus “agricultural activities that disturb the soil can greatly increase the frequency and amount of airborne dust” (Norstrom and Hott, 2004). Scientific reviews indicate that wind erosion and dust emissions may be created by farm operations such as “plowing, leveling beds, planting, weeding, seeding, fertilizing, mowing, cutting, baling, spreading compost or herbicides and burning fields” (Norstrom and Hott, 2004; Kasumba et al., 2011).

4.2. Mitigation of Wind Erosion or Fugitive Dust

- It is well established that farmers need to practice best management practices, such as the use of vegetative buffer strips, to minimize the potential of pesticides reaching sensitive non-target habitats. Some countries have established strict regulations, to meet these guidelines (Bereswilla et al., 2012).
- Management programs that may reduce the incidence of erosion include “planting windbreaks and special crops to alter wind flow; retaining plant residue after harvesting; tilling soil to bury erodible particles, create aggregates that resist entrainment, and increase surface roughness; improving farm equipment; and stabilizing soil surfaces using water or commercial products” (Norstrom and Hott, 2004; Anon, 2008).
- Once the sources of fugitive dust have been identified, “Control techniques and PM mitigation practices can then be devised to protect the people highly exposed to such emissions, especially personnel operating agricultural machinery and those living near the fields” (Kasumba, 2011).

4.3. Fugitive Dust

- According to a research paper on fugitive dust or particulate matter (PM) “A number of studies measuring agricultural PM emissions have reported considerable concentrations of PM due to agricultural operations”. In addition “PM emissions have been found to be a function of the type of crop grown” (Kasumba et al., 2011).
- Fugitive dust is an issue of concern for agricultural land grant institutions. For example at the University of California Division of Agriculture and Natural Resources, fugitive dust issues and exposure to the public have been a part of its three to five-year midterm planning program priorities. Part of the actions plans for the U.C. system in a 2001 planning document included to “Develop extension education on best available practices to prevent the emission of fugitive dust from agricultural operations, construction, land use decisions, and transportation issues such as traffic on unpaved roads.” The U.C. planners clearly understood that “Residential development in or adjacent to agricultural areas creates concerns about air quality within these homes and the impact on the health of residents” (Univ. California, 2001).

4.4. Health Risks from Fugitive Dust

Dust escapes from agricultural operations are understood to be an important cause of fugitive dust, with potential health consequences (Kasumba et al., 2011):

- Exposure to particulate matter (PM) has been linked to premature deaths among the elderly (Comis, 2000), and to an increased incidence of heart attacks (Mustafic et al., 2012), and mortality (Mokdad et al., 2004). According to a review on wind erosion "Health risks associated with elevated levels of dust include skin irritations and diseases, eye irritations, shortness of breath, respiratory disorders such as chronic obstructive airways disease, occupational asthma, interstitial lung disease, lung fibrosis, lung emphysema, hyper-responsiveness, hypersensitivity, and increased risk of lung and skin cancer" (Norstrom and Hott, 2004; Clausnitzer and Singer, 2000).

- It is well established that wind erosion may result in the "transport of herbicides on sediments" (Norstrom and Hott, 2004), with pesticides impregnated in the fugitive dust. Pesticides that have been found in fugitive dust include: DDT, DDD, DDE, Fosfall, Chlorpyrifos (Dursban), Prowl (Pendimethalin), Etoxinol, Trifluralin, Dieldrin, and PCBs (Rogge et al., 2007).

- Dust from grains ('grain dust') is a potential health hazard to field workers, and/or to those exposed to grain dust. Respiratory problems from grain dust has been reported worldwide for grain storage workers. Acute reactions include grain fever syndrome, allergies, and asthma, while reported chronic effects include hypersensitivity pneumonitis and chronic bronchitis (Olenchock et al., 1986). Grain dusts may contain contaminants such as bacteria, fungi, mites, fumigants, pesticides (Olenchock et al., 1986), and Bacillus thuringiensis (Meadows et al., 1992; Hagstrum et al., 2010). Inhalation of these substances has potentially "profound biological consequences" (Olenchock et al., 1986).

- Note that pesticides such as Chloropyrifos, Pendimethalin, and Bacillus, listed above, are used by the GM seed industry in Hawaii (see Section 5.0.).

4.5. Pesticide Drift to non-target areas

Pesticide drift is a well established phenomenon "recognized as a major cause of pesticide exposure affecting people as well as wildlife and the environment" (Shulze, 2004; Tuduri et al., 2006; Lee et al., 2011). According to Tuduri et al (2006) "It is now accepted that following application pesticides can enter the atmospheric compartment and travel many kilometers," and "For example, dacthal, chlorothalonil, chlorpyrifos, metolachlor, terbufos and trifluralin have been detected in Arctic environmental samples (air, fog, water, snow)."

Roundup may drift to non-target areas following spray applications, as frequently discussed in the research literature (Singh and Shaner, 1998), possibly affecting non-target species (Kurtz and Street, 2003). Recent research has confirmed the drift and presence of Roundup herbicide in the atmophere (Chang et al., 2011). According to Chang and colleagues (2011) “Glyphosate and its degradate, AMPA, were frequently observed in air particles and rain at all three locations that were studied.” Furthermore “Glyphosate occurred at concentrations equal to or greater than the concentrations of other high-use herbicides previously studied in the midwest” (Chang et al., 2011). With respect to AMPA, the metabolite of Roundup, the authors stated that “The presence of AMPA in air is due to wind erosion, because it is formed in the soil.” The authors concluded that ““The relatively elevated levels of glyphosate probably are due to its frequent use in these agricultural areas in conjunction with the genetically modified crops” (Chang et al., 2011).

Air sample surveys from agricultural communities in California detected residues of Lorsban (chlorpyrifos), which is another pesticide used by the GM Seed industry in Hawaii. According to a report from the survey conducted in Lindsay, California, “chlorpyrifos levels in Lindsay’s air exceeded levels of concern derived from U.S. Environmental Protection Agency (EPA) studies by up to 11 times. In 2006, 28% of the 116 air samples were above the “acceptable” exposure level for a one-year-old child based on EPA studies.” Because of the residues found on the air, the study also took blood samples of representative members of the community, and “The study found that 11 of the 12 people tested had above average levels of the primary chlorpyrifos breakdown product in their urine, and seven of the eight women had amounts above the “acceptable” level for pregnant and nursing women calculated from U.S. EPA data” (CPR, 2007).

Pesticides used by the GM Seed Industry, which have been documented to drift into non-target areas include atrazine, chlorpyrifos (Lorsban), cyfluthrin, Lambda-cyhalothrin (Warrior), dimethoate, metolachlor, and Roundup (Glyphosate) (Lee et al., 2011).

4.6. Pesticide residues in Aquatic Habitats

By the early 2000s, over 60 research papers had documented the presence of pesticides in aquatic habitats. Non-source pollution of surface waters may occur via runoff or via spray-drift contamination (Schulz, 2004; Bereswilla et al., 2012). Several of these studies reveal that some of the pesticides used by the GM Seed Industry, such as Lorsban, are frequently found in aquatic habitats at levels above those believed to cause environmental impact (Schulz, 2004). For instance, after the 1993 floods in the midwest U.S., according to a USGS hydrologist “the Mississippi River at Thebes (Illinois) was carrying more than 12,000 pounds of atrazine per day” (Panups, 1993).

Roundup has been detected in surface waters located in relative proximity to fields where Roundup is applied as a herbicide (Battaglin et al., 2005). Surveys have detected Roundup and its metabolite AMPA in streams and aquatic habitats of several U.S. mid-western states (Battaglin et al., 2005; Coupe et al., 2012).

With respect to Roundup “Although some conventional drinking water treatments such as activated carbon filtration, chlorine, and ozone seem to eliminate glyphosate, other treatments more common in primary sewage treatments such as settling and filtration may not. Glyphosate was detected twice as frequently in urban streams downstream from wastewater treatment plants than upstream of those plants” (Battaglin et al., 2005).

In Canada, Roundup and other herbicides were found to have drifted into wetlands. This research, published in 2011 was “the first field study to compare the masses of pesticides entering wetlands by atmospheric deposition” (Messing et al., 2011). Other herbicides, which are used by the GM Seed industry in Hawaii, and which were found to have drifted into wetlands of Canada included dicamba (Banvel), metolachlor (Dual), and bromoxynil (Buctril) (see Section 5.0.). With respect to Roundup, according to this study “Concentrations of glyphosate in wetlands may be due to atmospheric deposition” (Messing et al., 2011).

With respect to Kauai, the question remains whether pesticide drift or contaminated runoff from agricultural fields has reached the nearby Waimea stream or the ocean. In May 2011 the Kauai Garden Isle Newspaper reported that the County of Kauai issued notices of violation against both Pioneer and Dow Chemical for “grubbing area exceeding one acre, permit requirement and lack of minimum best practices.” According to the Kauai Garden Isle, “A source speaking on condition of anonymity said area residents witnessed mud slides along coastal agricultural fields following the heavy rains of last December, and that the subsequent muddy runoff ended up in the ocean and impacted commercial fishing.”

Furthermore, while Kauai County Engineer Larry Dill indicated that “The county has not conducted any underwater inspections” a caption of an underwater picture indicated that “Diver Terry Lilley captured images below the ocean on Jan. 29 near Dow fields in Waimea where non-permitted grubbing took place. He said he did seven dives over three days in an area within 100 yards of shore and found the coral ‘in bad shape’ and progressively deteriorating. He said the sediment was thick in the water and on the reef and visibility in the plume was from four to 10 feet in the areas where fish and young and old growth corals had previously created a healthy reef” (Vanessa Van Voorhis. County takes legal action against seed companies. The Garden Island, Kauai. May 4, 2011).

Some of the pesticides used by the GM seed industry in Hawaii (see Section 5.0.), which have been found in surface water surveys include: alachlor (Lasso), atrazine, bromoxynil (Buctril), carbaryl, dimethoate, dicamba (Banvel), Lorsban (chlorpyrifos), metolachlor (Dual), methyl parathion (Penncap-M), nicosulfuron (Accent), Permethrin, Glyphosate (Roundup), and Simazine (Princep) (Battaglin et al., 2005; Shulze, 2004, Frank et al., 1990).

4.7. Atrazine herbicide Health effects

While the complaint raised against Pioneer/DuPont in Kauai does not raise the issue of health from potential exposure of the community to pesticides, below are a few references with respect to potential health effects from exposure to some of the pesticides used by the GM seed industry in Hawaii.

Atrazine herbicide is manufactured by Syngenta, a Swizz agro-chemical company that is among the five GM Seed growers in Hawaii. Both Syngenta and academic product defense specialists continue to vouch for the safety of Atrazine. Dr. Stephanie Whalen, head of the former Hawaii Sugar Planters Association (now called HARC, Hawaii Agricultural Research Center), is a key supporter of the GM Seed and Pesticide industry in Hawaii. According to Dr. Stephanie Whale, from HARC, "*Atrazine is the most studied of all pesticides and comes up clean in each new study but the enviros/trial lawyers are after it*." Dr. Whalen cautioned that "*If atrazine goes down it will be the end of pesticide use as we know it*" and further cautions that if Atrazine is taken off the market: "*Hmm: no pesticides; no engineered crops; no food?*" (Stephanie Whalen, email Feb. 28, 2011).

In reply to the tone of Dr. Whalen's email a Senior UH Professor and Entomologist replied in an email to Dr. Whalen, that "Before you start impugning people because they have a different viewpoint, be honest and recognize the numerous studies that raise reasonable questions about the safety of atrazine (see links below). You can't have an open, honest, intellectually rigorous scientific discussion about risks and benefits if you start off by politically smearing people that disagree with you" (email Feb. 28, 2011).

Internal documents indicate that Syngenta has been involved in a PR campaign to discredit research showing potential adverse effects from exposure to Atrazine (Hodai and Graves, 2012; Jervin, 2012). U.C. Berkeley Professor Tyron Hayes, in a review on the potential adverse effects from Atrazine came to similar conclusions:

> "In summary, seven studies have been published to date that show effects of atrazine on amphibian sexual development. Although conducted under different experimental conditions, these studies support the conclusion that atrazine is a potent endocrine disruptor that both chemically castrates and feminizes male amphibians. The confusion generated by Syngenta's press releases and statements to the popular press has not been substantiated by peer-reviewed science. Furthermore, as described here, the studies made available to the EPA (Steeger et al. 2003a, 2003b, 2003c, 2003d, 2003e) and recent publications (Coady et al. 2004, Hecker et al. 2004) have not supported Syngenta's claims. Unfortunately, financial incentives and industry involvement in the research on this issue have generated

> confusion in the scientific community and the public sector, marking it more difficult to understand the science involved" (Hayes, 2004).

According to the Natural Resources Defense Council, "Banned in the European Union and clearly linked to harm to wildlife and potentially to humans, the pesticide atrazine provides little benefit to offset its risks." Also according to the NRDC "The most recent data confirms that atrazine continues to contaminate watersheds and drinking water. Atrazine was found in 80 percent of drinking water samples taken in 153 public water systems. All twenty watersheds sampled in 2007 and 2008 had detectable levels of atrazine, and sixteen had average concentrations above the level that has been shown to harm plants and wildlife" (source: http://www.nrdc.org/health/atrazine/).

Atrazine researcher Tyrone Hayes commented that ""We use 80 million pounds [of atrazine] annually in the United States. It's the number-one pesticide contaminant of ground water, surface water, and drinking water. It's used in more than 80 countries but it's now outlawed in all of Europe or, as the company likes to say, has been denied regulatory approval. The main point here is that here's a compound that we use 80 million pounds of, and it's illegal in the home country of the company that makes it" (LaSalle and Kripke, 2010).

Below is a brief sample of studies showing potential health risks from exposure to Atrazine:

Endocrine & Immune System Disruption
For general reference to research studies see, Hayes, 2004; Hayes et al., 2002; and Brodkin et al., 2007. In reference to Atrazine, a recent research report indicates that "Studies have suggested that exposure to environmental pollutants may modulate or disrupt the endocrine system of humans and wild-living animals in ways that are detrimental to the reproductive system and may cause cancer. According to the authors exposure to endocrine disruptors "is associated with the development of various diseases, including breast cancer" with Atrazine being "of particular concern" (Quignot et al., 2012).

Reproductive System Impacts
(Swan et al., 2003; Arbuckle et al., 2001)

Cancer
(Kettles et al., 1997; MacLennan et al., 2002; Sass and Brandt-Rauf, 2003)

4.8. Lorsban (Chlorpyrifos) Health Effects

Note: High bee toxicity
Note on text below: LOC= Level of Concern

Lorsban insecticide is produced by Dow Chemical, a major GM seed grower in Hawaii.

A resent study determined that Lorsban may interfere with gene expression and cell development with the human placenta as a possible “target organ.” The authors thus call for further studies on pregnant women exposed to Lorsban (Ridano et al., 2012). Health effects of Lorsban and other organosphosphate insecticides include delayed neurotoxicity, interference with brain development, possible adverse effects on fetal growth, increased risk of preterm delivery and spontanous abortions, impairment in neurodevelopment and psychomotor indices, plus an inverse relationship between weight at birth versus level of exposure to Lorsban residues in umilical cord plasma (Ridano et al., 2012).

Lorsban affects the nervous system, the brain and it is especially harmful to children (PANNA, 2004). A study found that fetal exposure resulted in “lower birth weight and length at age 3, delayed movement and mental and attention deficits” (Ruah et al., 2006).

Lorsban is also a “cholinesterase inhibitor, suspected endocrine disruptor and PAN Bad Actor pesticide” (PANNA, 2004). In addition, based on recently published studies "Scientists now estimate that as many as 1/4 of all U.S. children may have lower IQs due to eating foods sprayed with pesticides like chlorpyrifos" (PANNA, 2011). Also, “The vast majority of us - including children - carry breakdown products of the chemical in our bodies" (PANNA, 2011).

Lorsban residues were found in Latino families of Lindsay in the San Joaquin Valley of Central California. In 2005 Panups conducted surveys in Lindsay. From the 108 samples collected from drift catchers in 2005, Panups found that “Eighty percent contained chlorpyrifos, and the LOC [Level of Concern] was exceeded 23% of the time. In 2006, 28% of the 116 samples collected from six sites contained chlorpyrifos in levels that exceeded the LOC. That year, urine samples were also collected from 12 residents and tested for a metabolite of chlorpyrifos. The metabolite was found in everyone’s urine; all but one had levels above the national average and above the level EPA says is ‘acceptable’ (Dinham, 2010).

Similarly surveys from drift catchers conducted in Parlier, California found Lorsban “in most samples—often in amounts exceeding LOCs” (Dinham, 2010).

4.9. Roundup (Glyphosate) Health Risks

For a list of several suspected health side effects, based on animal studies, go to: https://docs.google.com/document/d/1FpOjzD_5UoPM9-ozbY8IyxGAQQkBTM8LEFzx4KZijng/edit?hl=en_US

A pdf version of this report (Health Effects of Roundup) can be downloaded from: http://dl.dropbox.com/u/33544971/RoundupHealth%20HV-11.pdf and in: responsibletechnology.org/docs/RoundupHealth2011.pdf

Roundup (Glyphosate), Glufosinate herbicide, and Bt residues in Humans

Roundup residues have been found in blood samples of field workers or residents in rural communities that are in proximity to farms that apply herbicides. A recent survey from Germany found Roundup residues in the urine of community residents (Brändli and Reinacher, 2012). However, other than the abstract, I have been unable to review this paper because it is written in German, so for now the data needs to be treated with caution.

A recent study found that Roundup and Glufosinate herbicide residues, both used extensively to grow GM crops, were found in the body of non-pregnant women. The same study found residues of the Bt toxin in pregnant women, and in the fetus. The Bt toxin was found in 93% of pregnant women, and in 80% of fetal blood samples. The authors concluded that “Given the potential toxicity of these environmental pollutants and the fragility of the fetus, more studies are needed” (Aris and LeBland, 2011).

While Monsanto claimed that the low levels of Roundup found in non-pregnant women could be inconsequential, the authors of the study responded that “nothing excludes the possibility of disruptions caused by low doses of glyphosate in the long term. Thus, it is necessary to undertake large and long-term studies in humans” (Ariz, 2011b) .

4.10. Suspected or documented Health or Environmental Impacts for other Pesticides used by the GM Seed Industry in Hawaii

Dicamba

- Listed by the U.S. EPA as a developmental toxin.
- Negative reproductive effects;
- Cholinesterase inhibitor;
- Linked to non-Hodgkin's lymphoma;
- Surface and groundwater contaminant;
  (PPB, 2002).

Dimethoate

- Reproductive function in animals (Walsh et al., 2000).

Carbaryl

- Potential Endocrine disruptor
- Exposures may cause sterility or decreased fertility, impaired development, birth defects of the reproductive tract, and metabolic disorders
- Linked to spontaneous abortion
- Linked to non-Hodgkin's lymphoma
- Toxic to fish, bees and earthworms
  (PPB, 2002)

Glufosinate (herbicide used to grow GM glufosinate-resistant crops)
With respect to Glufosinate and its metabolites "it has been recognized that 3-MPPA is neurotoxic, as well as glufosinate, causing severe convulsions." Concerning its metabolites "data from Aventis indicates that NAG, formed in transgenic plants, can be reconverted into the active herbicidal form by micro-organisms in the digestive tract of warm-blooded animals, including humans. Thus, it is possible that 3-MPPA can undergo the same reconversion and acquire the toxic effects of glufosinate. One more reason, 3-MPPA has been found more persistent and more mobile than glufosinate (Aris, 2011a).

Bacillus thuringiensis (Bt), Environmental Risks. Bt is an EPA registered pesticide that is embedded in Bt crops, such as on Bt GM corn varieties. Bt crops represent about 40% of the total acreage planted to GM crops globally. Concerns have been raised about potential environmental impacts when Bt residues reach non-target organisms. A recent survey of 217 streams in the Midwest found that 86% were contaminated with Bt corn residues. According to the authors over 250,000 Km of streams in the U.S. Midwest are within close proximity of corn fields. Its presence in aquatic habitats is an environmental concern because Bt residues may persist for up to 6 months in the water (Tank et al., 2010). A separate study determined that indeed Bt residues were harmful to some aquatic organisms (Rosi-Marshall et al., 2007). Some aquatic insects that had fed Bt pollen had reduced growth rates and greater mortality compared to non-Bt treatments. A separate study also showed that the Bt toxin increased with trophic

levels within the food-chain (Harwood et al., 2005), indicating the potential for risk, if the Bt toxin proves to be harmful to non-target organisms.

Bacillus thuringiensis (Bt), Health Risks. Concerns have been raised about potential health effects on humans and on field workers and communities exposed to dust from Bt crop residues. Recent research concluded that Bt residues in plants are not “inert” in terms of physiological activity in the body. The research found that the Bt residues, alone or in combination with the herbicide Roundup (Glyphosate) were toxic to human cells. Also, when combined with Roundup, Bt residues were found to promote apoptosis, or cell suicide (Mesnage et al., 2012). This finding follows earlier research showing that the Bt toxin promoted apoptosis in insect larvae cells (Loeb et al., 2000; Loeb et al., 2001). At the time Professor Joe Cummings criticized regulators for failing to address the known issue of apoptosis, and cautioned that “such agents require care in evaluating their impact on non-target animals and plants” (Joe Cummins, Sanet, email Feb. 11, 2005).

Other research based on animal studies found that Bt crops caused adverse effects on the kidney and liver, as well as some effects on the heart, adrenal glands, spleen and blood (Vendemois et al., 2009).

5.0. Partial List of Pesticides used by the GM Seed Industry in Hawaii

Note: Pesticides listed in the complaint include Lorsban, Atrazine, Princep, Dual II Magnum, & Warrior. The list below provides only a partial list of the pesticides used by the GM seed industry in Hawaii. If you have additional information about pesticides used in Hawaii, or about potential health or environmental risks please send to: hector@hawaii.edu.

Note: The chemical active ingredient, and the manufacturer are listed below in parenthesis.

Note: Of the 28 pesticides listed below, used for the production of GM seed crops in Hawaii, 75% are manufactured and sold by the GM seed companies (Dupont/Pioneer, Monsanto, Syngenta, BASF, Bayer, and Dow).

Note: For a list of pesticides used by the GM seed industry in Hawaii, that have been been detected in surface waters, based on national surveys see Section 4.4.

Accent, (Nicosulfuron, produced by DuPont, parent of Pioneer Seed)
Aquamaster, open (Roundup, Glyphosate, produced by Monsanto)
Atrazine herbicide, Triazine family (Syngenta)
Asana XL rice, soybean (Esfenvalerate, produced by DuPont)
Banvel herbicide, (dicamba, dimethylamine salt of dicamba)
Basagran, nutsedge/broadleaf, corn (sodium salt of Bentazon, also produced by BASF)
Baythroid XL, Hoppers, earworm, corn (beta-cyfluthrin, restricted use pesticide, extremely toxic to fish and aquatic invertebrates, produced by Bayer)
Bicep II Magnum, herbicide, weeds, corn (Metolachlor & Atrazine, Syngenta)
Buctril, herbicide (bromoxinil, Bayer),
Callisto, herbicide, nutsedge, corn (Mesotrione, Syngenta)
Carbaryl, insecticide (Sevin)
Dimethoate, insecticide
Dual II Magnum, herbicide, corn (S-metolachlor, produced by Syngenta)
Ignite 280SL + AMS, herbicide, corn, open (Glufosinate-ammonium, Bayer)
Lasso (alachlor, produced by Monsanto)
Laudis, herbicide broadleaf, corn (tembotrione, Bayer)
Liberty herbicide (glufosinate-ammonium, Bayer)
Lorsban advanced, cutworm, thrips, worms, corn (chlorpyrifos, Dow Chemical)
Oberon 2SC, whiteflies, rice (Spiromesifen, Bayer)
Penncap-M, cutworms, corn (methyl parathion)
Permethrin, insecticide, leaf hoppers, corn (Pounce)
Phostoxin Pellets, insects, rice, soybean, corn (aluminum phosphide, restricted use pesticide)
Princep, triazine herbicide (Simazine, Syngenta)
Prowl herbicide (Pendimethalin, BASF)
Quadris fungicide, rice, soybean (azoxystrobin, Syngenta)
Roundup Powermax, screening, open, corn (Monsanto)
Tilt fungicide, blights, corn (Propiconazole, Syngenta)

Warrior II w Zeon, worms, leaf hoppers, corn, rice (Lambda-cyhalothrin, restricted use pesticide, Syngenta)

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Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Puanani Rogers	Ho`okipa Network - Kauai	Support	No

Comments: I testify in strong support with amendments to require notifications to residents and revise rules and regulated to such.

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HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Sandra Herndon	Kauai Rising	Support	No

Comments: I ask your support of bill HB673, WITH AMENDMENTS to require notification to residents and a revision of rules and regulations to address this issue. The people deserve to know what/how much/ and when Chemical companies are loosing into the soil and atmosphere. This policy of blatant disregard for public health and well-being in deference to the BioTech Industries' fiscal well being is despicable and immoral. IF all is as the Chemical companies & their lobbyists claim, why are they afraid to be open and cooperative? Why should the onus be on the public to prove the dangers instead of the transgressors. Clearly, the level of their Corporate profits have been utilized to influence the educational research projects to contradict or denigrate research done in other countries, less controlled by American Corporatacracy.

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To: WAM Testimony
Cc: 77coconuts@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 12:46:37 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Kahala Lei Azuma Maui	Kanaka Freedom	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: ray.foster@monsanto.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 7:15:46 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Raymond J Foster	Molokai Farm Bureau	Oppose	No

Comments: Please accept this testimony in OPPOSITION to HB673, on behalf of Molokai Farm Bureau participating membership. MFB is an association of Hawaii Farm Bureau Federation Molokai members. Relevant information regarding the application of all pesticides APPROVED by the State of Hawaii and the EPA is readily available to the public in the product labels and Material Safety Data Sheets. Volume and distribution of hazardous materials is currentl recorded in other commerce recording documents. HB673 is simply another hysterical attempt on the part of political extremists to persecute legitimate and legal agricultural businesses. Please kill HB673 and bring common sense and fact based decision making back to our legislative process. Respectfully submitted. Raymond Foter, President, Molokai Farm Bureau

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Cc: ab4@hawaii.edu
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 2:51:44 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Amie Buttke	Individual	Support	No

Comments:

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To: WAM Testimony
Cc: Suiteness@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 12:42:21 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Annie Suite	Individual	Support	No

Comments:

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To: WAM Testimony
Cc: bichphuong14225@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:42:20 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
bich phuong	Individual	Support	No

Comments:

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Cc: 4wdtiki@gmail.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 3:07:59 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Bill Collins	Individual	Support	No

Comments: I am a registered voter in the County of Kauai. I strongly support the passage HB 673.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: billliverman@aol.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:42:56 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
bill liverman	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: best_budz89@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:42:33 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Buddy Smith	Individual	Support	No

Comments:

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To: WAM Testimony
Cc: saws123@myway.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 5:41:56 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Carl York	Individual	Support	No

Comments: strong support with amendments to require notification to residents and revise rules and regulated to such

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From: mailinglist@capitol.hawaii.gov
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Cc: uhanepono@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:04:45 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
caroline avery	Individual	Support	No

Comments:

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Cc: csounding@gmail.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 8:57:42 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Carrie Rautmann	Individual	Support	No

Comments: strong support with amendments to require notification to residents and revise rules and regulated to such a degree to keep people safe.

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To: WAM Testimony
Cc: daisygirlnm@yahoo.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 6:00:56 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Charlotte Casey	Individual	Support	No

Comments: I strongly support this with amendments to require notification to residents and revise rules and regulated to such. We live in Waimea Valley. Our homes and schools are covered on all sides by spraying. Our children mostly ALL have nebulizers and asthma inhalers in our homes. I got got prescribed Albuterol on Friday, for a lung condition. I have NEVER had an Asthma problem my whole life, until now. Coincidence? We don't think so. Please help our Ohanas. Aloha..

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: christidemuth@yahoo.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 9:08:17 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Christi Demuth	Individual	Support	No

Comments: This is very important bill. I support it completely.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: claudiarice25@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 10:02:50 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
claudia rice	Individual	Support	No

Comments:

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To: WAM Testimony
Cc: earlewave@hawaiiantel.net
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 6:32:06 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
danitza galvan	Individual	Support	No

Comments: strong support with amendments to require notification to residents and revise rules and regulated to such.

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To: WAM Testimony
Cc: Kumukahi77@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 9:18:09 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Dea Rackley	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: drtran_montreal@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:40:31 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Dick Tran	Individual	Support	No

Comments:

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To: WAM Testimony
Cc: dcwww@yahoo.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 8:52:37 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Donna Worden	Individual	Support	No

Comments: Please amend this to require that affected, or potentially affected, residents be notified. I understand that pesticide use on Kaua‘i and Moloka‘i has caused health problems for people. Until Monsanto is kicked out of Hawai‘i forever, at least help our residents stay as healthy as possible. Mahalo.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: donovanmaui@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:40:10 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
donovan kelsy	Individual	Support	No

Comments:

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To: WAM Testimony
Cc: inunybus@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 9:54:14 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Elaine D.	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: ford3@mail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:40:51 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Faye Ford	Individual	Support	No

Comments:

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Aloha,

I am in strong support of HB 673, relating to pesticides, and strongly urge the committee to pass this bill with an amendment requiring mandatory public disclosure regarding pesticide use. This amendment should include the mandatory disclosure of precisely what pesticides are being used, in what quantity and in what locations.

Regular disclosure reports should be made available to the public and properties or public areas that have the potential to be exposed to drift should be notified. Companies, individuals and departments utilizing various pesticides should be responsible for covering the costs involved in their disclosure and penalties should be applied in cases where no, or false, disclosure is made.

The threat of pesticide drift into communities, schools and other sensitive areas is currently under investigation throughout the state to ensure the safety of our community members; however accurate data on pesticide use is unavailable. The provision of accurate data is crucial in determining the threat of pesticide drift on these key areas.

Maximum use thresholds should be set for commonly used pesticides in order to avoid impacts to small businesses and individuals using low amounts of un-regulated pesticides. However, use of all regulated-use pesticides, experimental or controversial pesticides should be disclosed in full.

The passing of HB 673 is a crucial part of ensuring the safety of our community members, agricultural lands and environment. The ability to clearly determine the impacts of exposure, to anything, requires accurate and thorough data collection.

Please pass HB 673 with suggested amendments and give our elected officials, the government and the people of Hawai'i the right to know what pesticides are used in their communities.

Mahalo Nui

Fern Rosenstiel BSc
Environmental Scientist & Ecologist

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Cc: fivestarrugrats@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:41:06 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Frank Williams	Individual	Support	No

Comments:

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Cc: gysiemee@hotmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:41:43 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Geiselle Meek	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: jemray@hawaii.rr.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 8:04:48 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Janet Murray	Individual	Support	No

Comments: Support HB673

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To: WAM Testimony
Cc: gypse_rose@hotmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:42:03 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Gypsie Lewis	Individual	Support	No

Comments:

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Cc: palmtree7@earthlink.net
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 10:22:43 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
janice palma-glenie	Individual	Support	No

Comments: I support this legislation, that is one small step in educating pesticide users. the following words should be added, however, to make it a stronger bill: ""amend to require notification to residents." i'm a horticuluralist and landscape designer in Kona and have been for over 25 years. we have a coffee farm amidst others in Kona. the use and abuse of potentially harmful pesticides and herbicides goes unbridled around us, making us fear for the health of everyone, including children and pets who are exposed to those chemicals. People in our industry, not to mention homeowners, boast of increasing rates of use for chemicals despite warnings on labels. they dispose of them irresponsibly, often because safe alternatives to disposal don't exist on our island except twice a year. there are many substitutes to dangerous chemicals IPM approach to farming far preferable to lack of regulation. please support this bill to begin to better address the many problems of over use of toxic agricultural and residential pesticide use. mahalo for supporting this baby step legislation.

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To: WAM Testimony
Cc: mendezj@hawaii.edu
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 3:24:28 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Javier Mendez-Alvarez	Individual	Support	No

Comments:

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Cc: jeannine@hawaii.rr.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 9:42:02 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Jeannine Johnson	Individual	Comments Only	No

Comments: I support HB673 HD2 SD1 and reducing the negative impacts of pesticides on public health and the environment through an accurate and detailed collection of pesticide use data that will allow for adequate and scientific assessments of potential health problems related to pesticide exposure. In 1981, got married and became pregnant with my oldest son who was born in April of 1982. I lived in fear until his birth because Del Monte's spraying of the highly toxic pesticide heptachlor on its pineapple fields and feeding the pineapple tops to dairy cows contaminated Hawai'i's milk supply at that time. Can you imagine being told to "drink more milk" for your unborn baby and then worrying that the milk that you drank was poisoning him? Heptachlor is a carcinogen and the effects of this contamination were wide-spread. I had breast cancer in 2005 and, to this day, I still fear that my son will come down with cancer related to the milk that I drank when he was a fetus. One of the biggest users of pesticides, corporate conglomerate Monsanto, is also one of the highest bidders for farmland in Hawai'i, with statewide acreage increasing at an average rate of over 300 acres per year. In the U.S., the genetically engineered crops like those grown on Monsanto's farmlands increased overall pesticide use by 318.4 million pounds over their first 13 years on the marketplace (1996–2008) according to a study derived from U.S. Dept. of Agriculture data. The Fish and Wildlife Service estimates that 72 million birds are killed by pesticides in the United States each year. Pesticide surface runoff into rivers and streams can be highly lethal to aquatic life, and reproductive and nonreproductive effects in aquatic reptiles and amphibians have been reported. When pesticides are sprayed onto food, especially fruits and vegetables, they secrete and persist into soils and leach into groundwater, and pesticide spray can drift and pollute the air. Pesticides can enter the human body through inhalation of aerosols, dust and vapor that contain pesticides; through oral exposure by consuming food and water; and through dermal exposure by direct contact of pesticides with skin. The effects of pesticides on human health are more harmful based on the toxicity of the chemical and the length and magnitude of exposure. Farm workers and their families experience the greatest exposure to agricultural pesticides through direct contact with the chemicals. But every human contains a percentage of pesticides found in fat samples in their body. Children are more susceptible and sensitive to pesticides because they are still developing and have a weaker immune system than do adults.

Exposure to pesticides can range from mild skin and eye irritation to birth defects, tumors, genetic changes, blood and nerve disorders, endocrine disruption, and even coma or death. Chronic exposure has been linked to developmental disorders and autoimmune deficiencies. Recent increases in childhood cancers in throughout North America, such as leukemia, may be a result of genotoxic and nongenotoxic pesticides due to somatic cell mutations. Increased concentration of chemicals in air, water, and soil in the communities surrounding genetically engineered fields is a legitimate public health concern. Please don't sentence our families to live in fear that their children are being poisoned by Monsanto just so they can make money. We deserve to live in a healthy environment and environmental justice demands that you pass HB673 HD2 SD1. Mahalo.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: jroslie@mac.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 12:17:06 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Jeeyon Roslie	Individual	Support	No

Comments: I am in full agreement with Fern Rosenstiel's testimony: "I am in strong support of HB 673, relating to pesticides, and strongly urge the committee to pass this bill with an amendment requiring mandatory public disclosure regarding pesticide use. This amendment should include the mandatory disclosure of precisely what pesticides are being used, in what quantity and in what locations. Regular disclosure reports should be made available to the public and properties or public areas that have the potential to be exposed to drift should be notified. Companies, individuals and departments utilizing various pesticides should be responsible for covering the costs involved in their disclosure and penalties should be applied in cases where no, or false, disclosure is made. The threat of pesticide drift into communities, schools and other sensitive areas is currently under investigation throughout the state to ensure the safety of our community members; however accurate data on pesticide use is unavailable. The provision of accurate data is crucial in determining the threat of pesticide drift on these key areas. Maximum use thresholds should be set for commonly used pesticides in order to avoid impacts to small businesses and individuals using low amounts of un-regulated pesticides. However, use of all regulated-use pesticides, experimental or controversial pesticides should be disclosed in full. The passing of HB 673 is a crucial part of ensuring the safety of our community members, agricultural lands and environment. The ability to clearly determine the impacts of exposure, to anything, requires accurate and thorough data collection. Please pass HB 673 with suggested amendments and give our elected officials, the government and the people of Hawai'i the right to know what pesticides are used in their communities. Mahalo for your time and the consideration of my testimony, Fern Rosenstiel BSc Environmental Scientist"

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: landloper@mac.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 6:39:47 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Jeff Vesci	Individual	Comments Only	No

Comments: The time is now to stand up for future generations and stop the poisoning of our land, our water and our air for the corporations to make a fast buck.

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov

Aloha Representatives,

Thank You for considering my testimony today in support of HB673. I am a very concerned mother. These pesticides we are talking about are lethal to pollinators as well as aquatic life. They are poisoning the air air and drinking water. This concerns me deeply. Having some sort of way to monitor, regulate and minimize use should be a top priority.

Science has been relatively clear in predicting how few are the years between when the bees die and when the humans follow them. It appears now that the honey bees are pretty well on their way to extinction- in the majority of the globe.

Up till now it was considered something of a mystery as to who killed them.

New scientific evidence is now emerging to explain very clearly the sequence of steps - between Monsanto's marketing of GMO corn - and the death of the bees. Here below, please find the paper - with abundant references.

The global bee die off did not reach Brazil for example until just after they let in Monsanto's GMO corn. Now it is Australia's turn. That is one of the few places in the world which still has healthy bees. The test is whether they will follow the foolish lead of Brazil in letting in GMO corn.

Here is the deadly sequence of steps which created our global funeral for the bees:

1. 1. Monsanto decides- that since the bacteria Bacillus thuringiensis - kills a corn parasite- to insert the DNA sequence from that bacteria IN to their GMO corn.
2. The BT in the corn pollen causes an immune system response (rather like triggering a sneeze) in the bees- similar to if they had eaten the BT directly - also causes holes and porosity in the gut.
3. During the summer- the bees have enough protein to tolerate the immune 'sneeze' response- and still learn navigation ... BUT during the winter when protein (pollen) is in rather short supply in the hive- bees had evolved a survival response. IF a bee's immune system was threatened in Winter - then the hive was best served if it was eliminated. The way this works - is that the protein normally invested in learning and remembering complex navigation requirements- has gone into immune reaction- and so - those bees - immune challenged - get lost trying to get back to the hive. (Rather like the older people of the Eskimo's who simply don't show up at the next igloo in the march - during Winter).
4. This accounts for the facts:
    a. CCD - Colony Collapse Disorder was originally called: Fall Dwindle Disease - because the bee disappearance almost always is worst just as Winter sets in.
    b. It also explains why the few dead bees who are found- have the same blackened & porous guts- like bees responding directly to the BT.
    c. It also explains why the global bee die-off generally followed the spread of GMO crops.

COLONY COLLAPSE DISORDER AND GENETICALLY MODIFIED CROPS

by **Peter Olson** BA. Dip Ed.
Original version published in The Northern Star
NSW, Australia

- Genetically modified (GM) crops often contain a bacterium called Bacillus Thuringiensis (Bt)
- Most of the research on Bt has looked at the directly lethal

affects of Bt and little research has looked for indirectly lethal affects the Bt

- Some insects have been shown to survive the Bt poison by having a strong immune response to the Bt poison. (Ref R)
- Insects generally and Bees specifically, have been shown to experience learning impairment and memory disorder, if they have an immune response. (Ref A1, B, D, E)
- A learning impairment or memory disorder would mean that Bees could not navigate back to their beehive
- Thus, a learning impairment or memory disorder is lethal to a foraging Bee
- Colony Collapse Disorder (CCD) of Bees, was originally called Fall Dwindle Disease, meaning the disease occurred in the cold months of the year
- Bees use protein to construct a memory and their protein comes from pollen, but in winter there is no pollen
- Bees also use protein to achieve an immune response, so an immune response in winter, means all protein reserves are rapidly used up and none are left for memory formation. (Ref D)

Have you ever noticed that when you are sick, that you can't think quickly and clearly? It's a bee gets sick and can't think probably, it will not be able to return to its beehive.

Studies listed below show that learning in bumblebees is impaired, if the bumblebee has an immune response (Ref A1,B,D,E).

The insecticide Bt is incorporated into many genetically modified crops and Bt causes an immune response to a wide range of creatures in nature, even if it does not kill those creatures. (Ref Q,R,S)

It is a virtual certainty that the bumblebee does have an immune response to the Bt present in the pollen of genetically modified plants.

Bees only carry enough honey with them to fly directly to the target flowers and straight back to the beehive. The navigation to and from those flowers is extremely complex and so requires the bee to have a very good memory. Since learning and memory are impaired in bees that have an immune response, bees with an immune response get lost, run out of honey fuel, fall to the ground and are then are carried away by ants. Thus, if a bee gets lost, for even a few minutes, it is dead.

The *Encyclopedia Britannica* states of CCD that,

> "it appears that the disorder affects the adult bees' ability to navigate". (Ref Y)

Thus suggesting that worker bees fly out from the high hive to collect food, but get lost and never return.

In the case of the viruses and pathogens that have been suggested as causes of CCD, those viruses and pathogens result in large numbers of dead bees either inside or outside of the beehive. Dead bees are found outside the hive, because worker bees carry dead bees outside.
In CCD, the symptoms are that no dead bees are found inside or outside the beehive, rather all the,

> "worker bees from a beehive or European honey bee colony abruptly disappear" (Ref V).

One of the most common traits inserted into man-made genetically modified crops is

resistance to caterpillars, which is given by inserting a gene for a naturally occurring insecticidal bacterium called Bacillus thuringiensis (Bt).
In crops that are genetically modified to contain this Bt gene, the Bt will be present not only in the plants leaves and fruit but also in the pollen of the flowers. Thus Bees that take pollen from genetically modified crops are ingesting significant quantities of Bt insecticide. Many scientists have assured the public that Bt is safe, because Bt is not directly lethal to Bees.
However alcohol is also not directly lethal to a car driver, yet many car drivers have died from alcohol, even though alcohol is not directly lethal to a car driver. Scientists looking for a cause for CCD have generally looked for a direct cause, something such as virus or parasite, that is directly killing the bees. Discovering an indirect cause of mortality in bees, would be much more difficult and would only occur after scientists had first exhausted examining the most probable direct causes of mortality in bees.
A review of the literature shows that at the time of writing, according to **Cox Foster** et al 2009,

> "no single culprit has been identified" as the cause of CCD (Ref Z3).

German research (Ref C), showed that bees who were fed Bt were not killed by the Bt, but that they became greatly more susceptible to a subsequent disease challenge.
The Jenna University study showed that mortality in Bees exposed to a parasite, was far greater in Bees that had previously been fed BT, compared to Bees that were not previously fed BT (Ref C). Meaning that BT increased the susceptibility of Bees to the pathogen and thus Bt multiplied the mortality caused by the pathogen.
In regard to that increased mortality from a pathogen combined with Bt ingestion, the authors concluded,

> "the significant differences indicate an interaction of toxin and pathogen on the epithelial cells of the honeybee intestine. The underlying mechanism which causes this effect is unknown" (Ref C).

This is a highly significant finding because when GM crops containing BT were being approved, the universal assumption was, that GM crops containing Bt would be totally safe, because Bt has no effect on bees. Thus government scientists who approved GM Bt crops, would clearly have objected to those crops, if they thought that GM crops containing Bt would adversely affect bees.

In the USA, Cox Foster et. al. state of the CCD bee colonies that they studied,

> "we hypothesized that something had compromised the bees' immune system, making them susceptible to any number of infections that healthy colonies would normally fend off" (Ref Z3).

This sounds quite similar to the Jenna University findings above. Furthermore, Cox Foster et. al. note that their Bee autopsies found symptoms never observed before, such as scar tissue in the internal organs (Ref Z3).

Bt is a living bacterium, that forms crystals of *proteinaceous insecticidal endotoxins*, whose mode of action is to form a pore or hole in the insect's gut cell membranes (Ref Z2).
Since the mode of action of BT is to damage the gut lining and since Cox Foster et al. found scar tissue in the internal organs of Bees, the question must be asked, was the damage to the internal organs of Bees that Cox Foster et. al. found, caused by the Bt in the pollen of GM crops, that the bees ate?
Cox Foster et al. 2006 noted during the autopsies,

> "when wet mounts were examined they appeared to have crystalline arrays" and that "Crystal-like formations were observed in the thorax" (Ref Z4).

Bt toxins are crystalline.

Cox Foster et al. 2009, did consider the possibility that bees with CCD may have been poisoned by pollen from genetically modified crops. However the authors refer to earlier research, showing that the Bt toxin is only activated in certain insects and they note that the Bt toxin does not work in the digestive tracts of honeybees (Ref Z3).
Thus because of prior research showing that bees are not killed by Bt, and that BT cannot possibly effect bees, many bee scientists have avoided testing Bt on Bees, believing such testing has already taken place and have thus ruled out GM Bt as possible cause of CCD of Bees. The online encyclopedia Wikipedia takes a very different view however and does list GM crops as a possible cause of CCD (Ref V).

Testing for subtle, sub-lethal effects or synergistic affects of Bt with other organisms, where Bt is a cofactor, rather than a singular causative agent, has only been done recently. Where such testing has been done, the finding of sub-lethal effects or cofactor effects, was often by chance, rather than planned.
It was only by chance that the bees in the above mentioned Jena University study became infected with a parasite and thus only by chance that the scientists observed the synergistic effect, of combining a pathogen and Bt. The results of a growing number of studies, now show clear and substantial, non-lethal effects and cofactor affects, of Bt on Bees; a dramatic change from the previous scientific view, that Bt has no effect on Bees.

Even so, the non-lethal effects and cofactor affects of Bt on Bees still remain scantily studied and more research on these subtle kinds of affects is urgently required.

Ramirez et. al. 2008, tested Bt toxin on honeybees and discovered substantial non-lethal affects on the bees, including "disturbed learning performances".
Ramirez et al. concluded:

> "Our results show that transgenic crops expressing (Bt) Cry1Ab protein at 5,000ppb may affect food consumption or learning processes" in Bees (Ref B).

The honeybee depends upon an unusual array of complex learning processes, in order to successfully find its food and navigate back to the beehive.
Unlike a car driver who may not remember exactly where the car is parked, in a large parking lot and who can afford to take some time to find the car, the honeybee cannot afford to forget, even for a short time, exactly where the beehive is located, even if the hive is several miles away. Memory impairment is not lethal to humans, but memory impairment and learning impairment is indeed lethal to honeybees. Thus in addition to causing increased disease susceptibility, BT is also shown to produce cognitive impairment in Bees.

It is important to note that BT is not the only insecticidal that has been shown to cause cognitive impairment in Bees.
Cox Foster et al. mentioned in 2006, that Neonicotinoid insecticides can produce sub-lethal effects, such as learning impairment and that as a result of a such learning impairment, Bees "may not be able to learn the location of the hive" (Ref Z4) and may thus may be unable to navigate back to the hive.
So one can now see, a proven trend, of learning impairment in Bees, caused by insecticide exposure at a sub-lethal dose. Cox Foster et al. 2006 clearly state what happens when Bees eat pollen contaminated with sub-lethal doses of neonicotinoid insecticides.

> "If bees are eating fresh or stored pollen contaminated with these chemicals at low levels, they may not cause mortality but may impact the bee's ability to learn or make memories" (Ref Z4).

That sounds very similar to the above reference from Ramirez et al. 2008 who found "disturbed learning performances" in Bees after consumption of GM Bt pollen (Ref B).

So the learning impairment in Bees, induced by consumption of insecticidal GM Bt pollen, can be seen as part of a larger trend for sub-lethal doses of certain insecticides, to produce learning impairment in Bees.

The difference between a neonicotinoid insecticide spray and the Bt insecticide in a genetically modified crop, is that the former is very easy to restrict or recall, whereas the latter may prove impossible to recall. With genetic materials, the quantity of GM material in existence gets bigger as time passes. If a problem develops with a GM crop, then that problem will likely increase as time passes.

The fact that CCD can be transmitted by beehive equipment could be to do the presence of the Bt bacterium in that beehive equipment and and the fact that Cox Foster et. al. were able to break the cycle of CCD by irradiating the beehive equipment (Ref Z) and restocking with a new supply of Bees, could be due to the fact that the Bt bacterium was killed by the irradiation.

In order to understand CCD, or the disappearance of bees, one needs to understand something about the specialized lifestyle of the bee. In order to save weight and increase performance, bees only carry enough fuel (honey) to fly directly to the target flowers and then straight back to the beehive. If a bee gets lost, or encounters unexpected head-winds, it will not have enough fuel reserves to make it back to the beehive. Instead it will fall to the ground and die.
Ants will then carry the dead bee down into the ant nest.

Memory is also crucial to bees because a bee has to learn from other bees in the beehive, where the target flowers are located. The Bee must memorize the directions from the hive to the target flower and back again, so a perfect memory is essential for the survival of bees. Other insects like mosquitoes are less reliant on a good memory, and simply "follow their nose" to the food - whereas bees rely on memorizing complex navigation tasks and memorizing specific aromas (Ref F), to find specific food and then to find their way back to the beehive.
If one was to impair the learning or memorizing ability of bees, that would cause indirect mortality in bees, since they would not be able to find their way back to the hive.

GM Bt pollen is widely known not to kill bees directly, but was not tested prior to the release of GM Bt crops, for the ability of GM Bt pollen to kill bees indirectly, through impairing the memory of Bees.

There is scientific agreement that many different things can be lethal to Bees - such as disease, chemical sprays and even certain seed coatings.

In the Flour Moth Ephestia kuehniella, a non lethal response to Bt and "tolerance (of Bt) correlates with an elevated immune response" to the Bt. (Ref R). For 99.99 percent of creatures, such a non-lethal immune response to Bt is of no practical significance and because of this, Bt is referred to as "soft" and is used widely in organic agriculture.
There is however one particular species that is very unusual, in that it has a life threatening response, to sub-lethal immune stimulation (Refs B, D, E) and that species is the Bee. Immune response in Bees, can lead to memory loss and learning impairment (Ref B,D,E) and as previously stated, loss of memory would cause bees to forget where the beehive is located.
Bees are insects and an,

> "immune response inhibits associative learning in insects" (Ref E).

Bees are now eating GM Bt pollen and Bt is toxin known to cause a non-lethal immune response in a wide variety of creatures (Ref Q,R,S).

Bees use up protein in memory formation and they also use up protein if they have an immune response (Ref D). Bees only protein source is pollen and if pollen is in short supply and bees have an immune response, they will use all available protein for the immune response, leaving none available for memory formation (Ref D).
Pollen for bees is in short supply during Autumn and Winter, so if bees have an immune response when pollen is in short supply, they will lose their memory (Ref D). CCD was originally called *Fall Dwindle Disease*, meaning loss of bees in the Autumn, when pollen from flowers is in short supply. If bees loose their memory, they lose their navigational skills, they fail to find their way back to the beehive, they fall to the ground, die and get carried away by ants and are never seen again.
As mentioned above, the loss of memory due to an immune response, is not confined to Bees, but occurs in insects generally.

> "The cost of an immune response (in insects) therefore not only affects survival of the host…. but also everyday behaviour and memory formation" (Ref E).

This learning impairment was only discovered recently (Ref E), long after GM crops had already been planted, however the effects of the GM Bt crops will go on for millions of years, since, like other introduced foreign species, GM crops can not be recalled.

During discussions with various Bee scientists, the writer was unable to find any scientist who had ever heard that insects and Bees loose their memory if they have an immune response. Perhaps the reason they did not know, is because the discovery of an immune - memory relationship in insects is very recent.
There is no evidence of direct mortality in bees from exposure to GM Bt crops, yet there is substantial evidence of sub-lethal effects in Bees from such exposure, that can result in high indirect mortality of Bees. If every air plane pilot had a sudden, non-lethal lapse of memory, there would be chaos which could cause in high mortality. Similar chaos occurs for Bees if they have a sudden lapse in memory, caused by an immune response and coincident pollen protein deprivation (Ref D).

When speaking to a PhD at a Gene Regulator's office, that PhD scientist described some of the information herein as "new" and not previously known by that Gene Regulator. Scientists that wish to defend GM Bt crops, need to counter the proven scientific evidence of indirect mortality in Bees that is provided herein, rather than simply stating that GM Bt pollen is not directly lethal to Bees.

Bt toxins produce sub-lethal effects in Bees and those sub-lethal effects result in changes in the Bee's "feeding behavior", "learning processes" and "foraging efficiency" (Ref B). Behavior change is evidence of learning impairment, and learning impairment can lead to lethal situations for Bees in the field - navigation problems and reduced flower finding abilities (Ref F), which are dependent on a perfect memory.

The different kinds of toxic GM Bt crystalline proteins are designated with different letters; Cry1A, Cry2A, Cry3A, etc.
Scientists in Mexico discovered that,

> "the Bt toxin Cry1Ab caused reduced foraging activity in bees after they were fed with syrup containing the toxin" (Refs A, A1).

Something new is being put into the Bee's environment; something which is herein shown to impair the Bees functions and to increase their mortality from diseases such as parasites (Ref C).
Bees do not simply go out and look for any flower. They learn and memorize the aroma and location of a specific flower while in the hive, then they fly directly to that specific flower's location (Ref F). Memory impairment would thus prevent Bees from finding a specific flower's location and similarly prevent Bees successful return to the hive.

It is crucial to understand that with CCD, dead Bees are seldom found in or near the hive.
When Bees are attacked by the lethal Bee mite,

> "thousands of dead bees will pile in front of the hive" (Ref U), as a result of infestation.

In the case of CCD however, few if any dead Bees are ever found in or around the hive. Hence although Varroa mite is a serious disease of Bees, its symptoms do not match the symptoms of CCD. Also, the timing of Varroa mite infestation does not match the timing of CCD appearance. Varroa first entered Japan in 1960's, Brazil in 1971, France in 1982 and the USA in 1987 (Ref T), but CCD was first noticed in USA around 2004, and in Europe about 2006, many, many years after Varroa arrived, but only shortly after GM crops were widely planted.
The writer does not wish to rule out other possible causes for CCD, because the intent is to simply demonstrate that GM Bt crops may harm Bees, regardless of whether they are the sole cause CCD or not.
It took decades to show that cigarette smoking was harmful and it could take just as long to gain consensus over the cause of CCD. It is simpler to suggest GM Bt pollen causes Bee memory loss (Ref D, E). That memory loss occurs when Bees have an immune response and are deprived of pollen (Ref D).

The *German Speigel article* states that the bacterial toxin in the genetically modified corn may have "altered the surface of the bee's intestines, sufficiently weakening the bees to allow the parasites to gain entry" (Ref C).
Wikipedia says that the mode of action of Bt through making pores or holes in the gut lining (Ref T) and such holes caused by Bt, would obviously allow the parasites a new and easy pathway into the Bee. Is it not logical, that Bt exposure in the wild, would cause a similar, significant increase in mortality from parasites, like Microsporidia, just as it did in the trials (Refs A2, C)?

Bees are a key species for human food supply and bio-diversity and several lethal risks to Bees from GM Bt pollen are demonstrated here.

Britain's chief scientist Sir **David King**, once *proudly* stated that Genetically Modified (GM) crops "could solve third world hunger". Later he admitted that his claim was wrong (Ref M) and in fact the real outcome would appear to have been the exact opposite of his prediction. Now that GM crops have been widely planted and hence can not be recalled, we learn that GM crops actually produce significantly lower yields than natural varieties do.
A large American study showed that,

> "modified soya produces 10 per cent less food than its conventional equivalent" (Ref O).

REFERENCES

NB: References with a PMID number can be found at the US National Library of Medicine website below, by simply typing the PMID number in the search box and hitting the enter key.
http://www.ncbi.nlm.nih.gov/sites/entrez?db=pubmed&TabCmd=Limits

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  ISIS Press Release 26/04/07
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  http://www.i-sis.org.uk/MysteryOfDisappearingHoneybees.php
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  Ramirez-Romero R, Chaufaux J and Pham-Delègue M.
  Effects of Cry1Ab protoxin, deltamethrin and imidacloprid on the foraging activity and the learning performances of the honeybee Apis mellifera, a comparative approach Apidologie 2005, 36, 601-11.
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  http://www.gmo-safety.eu/en/safety_science/68.docu.html
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  Does Cry1Ab protein affect learning performances of the honey bee Apis mellifera L. (Hymenoptera, Apidae)?
  Ramirez-Romero R, Desneux N, Decourtye A, Chaffiol A, Pham-Delègue MH.
  Instituto de Ecologia A.C., Km. 2.5 Carretera Antigua a Coatepec No. 351 El Haya, 91070 Xalapa, Veracruz, Mexico.
  The tested concentrations of Cry1Ab protein did not cause lethal effects on honey bees. However, honey bee feeding behavior was affected when exposed to the highest concentration of Cry1Ab protein, with honey bees taking longer to imbibe the contaminated syrup. Moreover, honey bees exposed to 5000ppb of Cry1Ab had disturbed learning performances. Our results show that transgenic crops expressing Cry1Ab protein at 5000ppb may affect food consumption or learning processes and thereby may impact honey bee foraging efficiency.
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  Spiegel Online International: March 22, 2007
  - COLLAPSING COLONIES
    Are GM Crops Killing Bees?
    By Gunther Latsch
    quote: "when, by sheer chance, the bees used in the experiments were infested with a parasite... a "significantly stronger decline in the number of bees" occurred among the insects that had been fed a highly concentrated Bt poison feed."
    According to Hans-Hinrich Kaatz, a professor at the University of Halle in eastern Germany and the director of the study, the bacterial toxin in the genetically modified corn may have "altered the surface of the bee's intestines, sufficiently weakening the bees to allow the parasites to gain entry -..."
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  Riddell CE, Mallon EB.
  Department of Biology, University of Leicester, UK.
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Ecology and Evolution, ETH Zürich, ETH-Zentrum NW, CH-8092 Zürich, Switzerland.
Here, we present behavioural evidence indicating a link between the immune system and the nervous system in insects. The cost of an immune response therefore not only affects survival of the host, as previously shown, but also everyday behaviour and memory formation.
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Related Links
Insect psychoneuroimmunology: immune response reduces learning in protein starved bumblebees (Bombus terrestris).
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  Quote: The Mexican government has confirmed earlier reports that transgenic maize is growing within the country's borders and has apparently contaminated wild varieties, despite a national ban on the cultivation of genetically modified (GM) crops. A government-commissioned study has shown that as many as 95 per cent of maize fields in the Mexican states of Oaxaca and Pueblo contain evidence of GM 'contamination'.
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  Toxins in transgenic crop byproducts may affect headwater stream ecosystems.
  Rosi-Marshall EJ, Tank JL, Royer TV, Whiles MR, Evans-White M, Chambers C,
  Griffiths NA, Pokelsek J, Stephen ML.
  Department of Biology, Loyola University Chicago, Chicago, IL 60626, USA. erosi@luc.edu

  We show that corn byproducts, such as pollen and detritus, enter headwater streams and are subject to storage, consumption, and transport to downstream

water bodies Laboratory feeding trials showed that consumption of Bt corn byproducts reduced growth and increased mortality of nontarget stream insects. Stream insects are important prey for aquatic and riparian predators, and widespread planting of Bt crops has unexpected ecosystem-scale consequences.

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  Quote: We present evidence that tolerance to a Bt formulation in a laboratory colony of the flour moth /Ephestia kuehniella/ can be induced ….. and that the tolerance correlates with an elevated immune response.
- Ref S
  http://www.ehponline.org/members/1999/107p575-582bernstein/bernstein-full.html
  Environmental Health Perspectives Volume 107, Number 7, July 1999
  Immune Responses in Farm Workers after Exposure to Bacillus Thuringiensis Pesticides
  Leonard Bernstein, Jonathan A. Bernstein, Maureen Miller, Sylva Tierzieva,1 David I. Bernstein, Division of Immunology, Department of Internal Medicine, University of Cincinnati, USA. Quote: Exposure to Bt sprays may lead to allergic skin sensitization and induction of IgE and IgG antibodies
- Ref T
  http://en.wikipedia.org/wiki/Bacillus_thuringiensis
- Ref U
  http://beelab.osu.edu/factsheets/sheets/varroa_mites.htm
  Dr. James E. Tew, Associate Professor of Entomology, Beekeeping Consultant
  quote: Colonies can die so fast from high Varroa infestations that thousands of dead bees will pile in front of the hive.
- Ref V
  http://en.wikipedia.org/wiki/Colony_Collapse_Disorder

- Ref W
  http://cat.inist.fr/?aModele=afficheN&cpsidt=17736738
- Ref X
  http://www.i-sis.org.uk/agrobacteriumAndMorgellons.ph
- Ref Y
  http://www.britannica.com/EBchecked/topic/1348211/colony-collapse-disorder
- Ref Z
  Science 12 October 2007:Vol. 318. no. 5848, pp. 283 - 287
  A Metagenomic Survey of Microbes in Honey Bee Colony Collapse Disorder
  Diana L. Cox-Foster Et Al
- Ref Z2
  http://en.wikipedia.org/wiki/Bacillus_thuringiensis
- Ref Z3
  Solving the Mystery of the Vanishing Bees
  Scientific American Magazine - March 31, 2009
  Cox-Foster D. and vanEngelsdorp D.
- Ref Z4
  Fall Dwindle Disease: A preliminary report
  December 15, 2006 Dennis vanEngelsdorp, Diana Cox Foster, Maryann Frazier, Nancy Ostiguy, Jerry Hayes,
  CCD Working Group, The Pennsylvania State University

Return to Dan Winter
Return to Genetically Engineered Foods
Return to 'Who' or 'What' is Killing The Bees?
Return to Monsanto - A Multinational Factory of Death

Here is another example of pesticides and the direct killing of our pollinators>> Please Do Not ignore what is obvious to do . Monitor & minimize use of these toxic chemicals.

Reported 1,500 Colonies of Honeybees Die in Campeche

By Jesse Herman On February 10, 2013 · Add Comment

According to The Yucatan Times

1,500 colonies of honeybees, from a community in Hopelchen, Campeche, died this February 6 from the fumigation of Monsanto's GMO's in a nearby area.

This has directly impacted more than 50 impoverished families, who recently suffered a poor corn crop due to drought. The community was relying on their sale of organic honey to compensate for the lack of maize. The current honey left by the bees is also lost due to the contamination of pesticides and transgenic pollen.

Alvaro Mena, a mayan farmer from Hopelchen and member of the Network in Defense of Maize, estimated losses at nearly 10 million pesos and is the equivalent of one year's worth of corn and honey production for the community.

Fumigation has intensified where GM crops have been planted in Mexico. GMO's are known to be resistant to pesticides and are planted in large monocultures, applying huge amounts of Roundup. It is no accident says Mena: it is the toxic onslaught that comes with GM crops and the threat of allowing millions of acres of GM Maize to be planted.

Mena attended the debate at which officials failed to attend and began with his witness of GMO's. Thousands showed up to participate in the debate on GM maize on Thursday, February 7, in a packed auditorium of the Faculty of Science, organized by several networks, including #YoSoy132 Environmental Via Campesina Popular Urban Movement, and the Network in Defense of Maize.

The officials were called to discuss the authorities of Agriculture, Environment and the Interministerial Commission on Biosafety and Genetically Modified Organisms (Cibiogem), but did not attend the meeting of social organizations and visiting scientists. The two secretariats claimed that they had no position on the issue. Currently, there are thousands of hectares of experimental and pilot fields in Mexico contaminating transgenic maize fields. Cibiogem, is reported to have had a busy schedule and could not attend.

Semarnat's response, sent the day of the debate, stated that the "reports that are pending will not go away because of a think tank debate." The debate was composed of academics from UNAM, CINVESTAV, Colpi, Conacyt UAAAN and was meant to determine a "public policy on GM corn."

Several opinions are not in favor of GMOs, and many scientific recommendations have been given to the recently elected Mexico Government from the first day they took office. They have received a solid flow of documents signed by researchers from the above mentioned institutions and others (over 3,000 scientists and experts, who have a high number of national and international awards) calling to cancel transgenic maize crops in centers of origin for the risks involved, and to establish "an immediate review of the environmental and social aspects that would be impacted by planting transgenic maize in Mexico, based on rigorous science and broad

public participation (…) for the consideration of the best technological options to address food production in our country. ”

In favor of GMO’s, Dr. Antonio Turrent, president of the Union of Scientists Committed to Society (www.uccs.mx) showed that transgenic maize is necessary to increase maize production in Mexico, and that the country has land conditions, water, seeds and diversity of public resources and technologies to meet all of Mexico’s current and future needs without jeopardizing economic independence, diversity, health or the environment, as implied by the GM. Dr. Turrent who recently published a study detailing these options.

On the other hand, Peter Rosset, biologist and researcher, presented a list of papers published in refereed scientific journals, particularly a compilation of studies conducted in 2009 by scientists and Ioannis S. Dona Artemis Arvanitoyannis, indicating that GM crops are associated with toxic effects, hepatic, pancreatic, renal, reproductive and immune and blood disorders and cancer effects. He said the study by Dr. Séralini in France (2012), where it studied the Monsanto GM maize planted in 700,000 hectares in Mexico, caused cancer in rats. In this regard, Rosset said that since Mexico is a country that consumes more corn than any other country, and because of the risks that have been observed in several studies for years, recommended that Mexico does not expose the public to GM Maize. He said the risk is greater for children who will be most affected. He considers it urgent to apply the precautionary principle, and cancel the transgenic, for future generations.

At the debate, the convening organizations, including urban, rural and students expressed their critical views on GMOs from their perspectives. They manifested their intent to stop the planting of GM maize and will continue through all struggles and will do all that they can to not allow the government to impose, against the interests of the vast majority of the population, GM Maize for the benefit of Government and a few multinationals. They agreed to promote further discussions, forums and activities, and strengthen the links between the organizations to avoid GM foods and crops. Also they will promote the widest possible participation in the pre-hearings on Corn and Food Sovereignty of the Permanent Peoples Tribunal, which among other topics will hold a pre-hearing of scientific evidence on GM and failures and corruption of the biosecurity system in the country.

Alvaro Mena called to the public to support the growth of 2013 becoming the “Year of resistance to transgenic corn and native corn in defense of life and independence of the peoples of the Maize.”

Glyphosate Toxic to Mouth Cells & Damages DNA, Roundup Much Worse

Further evidence of genotoxic and cytotoxic effects – a prelude to cancer, birth defects and reproductive problems Dr Eva Sirinathsinghji

A fully referenced version of this articles is posted on ISIS members website and is otherwise available for download here

New research finds that glyphosate causes cell and DNA damage to epithelial cells derived from the inside of the mouth and throat [1]. It raises concerns over the safety of inhaling glyphosate, one of the most common ways in which people are exposed to the herbicide.

Siegfried Knasmueller and his colleagues the Medical University of Vienna, Austria, found that Monsanto's formulated version of glyphosate called Roundup Ultra Max caused cellular damage and DNA damage including chromosomal abnormalities and ultimately killed the cells at higher concentrations. Importantly, DNA damage occurred at concentrations below those required to induce cell damage, suggesting that the DNA damage was caused directly by glyphosate instead of being an indirect result of cell toxicity.

These are not the first findings of glyphosate-based herbicides' cytotoxic and genotoxic effects. Numerous independent research teams have been documenting the hazards of glyphosate exposure over the last few years with *in vivo*, *in vitro* and clinical studies.

DNA damage was observed in blood samples from exposed residents in Argentina and Ecuador [2, 3]. Lab mice were found to harbour chromosomal and DNA damage in bone marrow, liver and kidney cells as well as lymphoid cells [4]. Similar effects were found in non-mammalian species, including sea urchins [5], goldfish [6, 7], eels [8], tilapia fish [9] as well as the fruitfly [10]. These experiments show that glyphosate herbicides are dangerous for humans and many other animals. Glyphosate is highly soluble in water, so impacts on aquatic wildlife may be of particular concern, especially following the recent report on the presence of glyphosate in rain water, groundwater, rivers and air [11, 12]. Its extreme toxic effects on amphibians such as frogs has already been shown (see [13] Roundup Kills Frogs, *SiS* 26). Cell damage has been documented in many cell types including those derived from the rat testis (see [14] Glyphosate Kills Rat Testes Cells, *Si*S 54), human placenta, umbilical cord, and embryo (see [15] Death by Multiple Poisoning, Glyphosate and Roundup, *SiS* 42), rat and carp neurones [16, 17], and liver [18, 19].

Multiple tests all show cellular damage in response to Roundup

To reflect occupational exposure, human buccal epithelial cells were exposed to glyphosate and Roundup for 20 minutes only at concentrations from 10 mg/L to 200 mg/L. The Roundup formulation used for the experiments contains 450 g/L of glyphosate and should be diluted according to the manufacturer's instructions to 1–3 % before use (final concentration 4 500–13 500 mg/l). The researchers found some significant effects with 10-20 mg/l, equivalent to a 225–1 350-fold dilution of the spraying solution.

Cell damage was assessed by the release of the membrane-bound enzyme lactose dehydrogenase into the culture medium. The integrity and viability of cells was indicated by their staining with neutral red as only healthy cells retain the dye. Mitochondrial function was assessed by measuring the activity of the enzyme mitochondrial dehydrogenase with the substrate XXT that gives a yellow colour product. And cell proliferation was measured by the total protein content of the cell cultures.

The results showed that the cells were much more sensitive to the Roundup formulation than glyphosate. With Roundup, a significant effect was seen at a dose level of 40 mg/L with the XXT assay, while a clear increase of the lactose dehydrogenase levels was seen already with 10 mg/L. The cell proliferation and the neutral red assays were less responsive, with significant effects detected at 80 and 100 mg/L, respectively (still well below agricultural use levels). All effects were dose-dependent.

With glyphosate, no significant effects were seen in 3 of the 4 assays, with only lactose dehydrogenase showing significant effects at over 80 mg/l.

Multiple tests show Roundup causes DNA damage

DNA damage was analysed by two methods. The first is the Single Cell Gel Electrophoresis (SCGE) assay, which reveals single or double-stranded breaks in DNA. The second is a special comprehensive assay of chromosome instability that picks up many DNA aberrations including chromosome breakage, DNA misrepair, chromosome loss, as well as cell death by either necrosis (cell death that results from external stressors such as toxins), apoptosis (programmed cell-death) and cell growth. Different nuclear anomalies were measured including micronuclei, a biomarker of chromosomal damage, breakage or loss; nuclear buds, a biomarker of elimination of amplified DNA and/or DNA repair complexes; and nucleoplasmic bridges reflecting the formation of dicentric chromosomes (chromosomes with 2 instead of 1 centromere) , a marker of DNA misrepair and/or end-fusions of the chromosomes.

Significant effects on DNA integrity as assessed by the SCGE assay were seen at 20 mg/l of both Roundup and glyphosate, increasing in a dose-dependent manner.

Exposure of the cells for 20 minutes also led to a significant and dose-dependent increase of nuclear anomalies including increases in the total number of micronuclei beginning at 10 mg/L of Roundup, and 15 mg/L of glyphosate. The number of nuclear buds increased with exposure concentrations, starting at 10 mg/L with both glyphosate and Roundup. In the case of the nucleoplasmic bridges, the only significant effect was obtained with the highest dose of Roundup used (20 mg/L). Apoptotic

cells were observed following 20mg/L of Roundup but not glyphosate, while necrosis occurred in response to 20mg/L of both Roundup and glyphosate.

In summary, Roundup was cytotoxic at concentrations as low as 20 mg/L, while its active ingredient was not generally cytotoxic to buccal epithelial cells. Both glyphosate and Roundup elicited genotoxic effects at concentrations below the level required to induce cell damage. The different effects between the active ingredient and its commercial formulation is consistent with previous work, including experiments done on testicular, placental, embryonic and umbilical cord cells (see above). These results may explain some of the ailments observed in people who work with this herbicide and adds yet more weight to an outright ban of the herbicide [20] Ban Glyphosate Herbicides Now, *SiS* 43).

From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: naldajw@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 7:53:23 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
JW Nalda	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: kcdassis@gmail.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 7:40:54 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Katherine Dassis	Individual	Support	No

Comments: amend to require notification to residents.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: blujadegirl@yahoo.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 10:37:10 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Laura Michele	Individual	Support	No

Comments: Mahalo nui loa for the growing surge of support for a GMO Free Kaua`i!! We are so grateful that this issue is being highlighted by our entire island. Together we can create a healthy and happy future for Hawai`i. Aloha Committee members, Hawai`i SEED and GMO Free Kaua`i strongly support the creation of a Pesticide Registry for our state. We would be happy to help connect you with experts and models of how this has been accomplished in other states. On Kaua`i we have 5 of the Big 6 chemical companies. They are leasing over 12,000 acres for experimental crops in various attempts to create herbicide resistant grains like corn, soy, sunflower and rice. We have more test fields than anyother place on Earth. We currently have no disclosure of what is being sprayed, and where. We do observe signs that show they are using a very long list of highly toxic chemicals such as round up, atrazine, dicambra, chlorpyrifos and 2-4,d. The community has a growing concern about the ever increasing amounts of stronger and stronger chemicals, and more and more acres, but we have very little information. We need to set up a system of the spraying and chemical irrigation so that communities can protect themselves from exposure. Chemical Agriculture may look green and benign but unless you live near these fields you would never know the the true experience of undisclosed spraying. This is radically different than local food farming. Residents and students suffer from sore throats, headaches, shortness of breath and nausea. We need the right the know so that we can take precautionary steps to avoid repeated and prolonged exposure in our homes, schools and hotels. Pesticide drift can travel to non target areas. If we had more information we could avoid exposure for the children, the kapuna and pregnane women. Pesticides are especially harmful to babies in the womb. This is a very reasonable request and Kaua`i asks for your support of a pesticide registry. This is long overdue for a state with the distinction of being number 1 in gmo experimentation. We should all understand the unintended reality of these research practices by chemical companies. Mahalo nui loa for supporting disclosure for the residents from Polihale to Poipu, and Lihue. We need your help, too many people are at risk without adequate representation and without proper disclosure.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: laurenelaine721@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 8:46:33 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Lauren Ampolos	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: leslielarsen@earthlink.net
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 6:46:08 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Leslie Larsen	Individual	Support	No

Comments: I am in strong support with amendments to require notification to residents and revise rules and regulated to such - NOW not 2050 - that is absurd. I strongly support the Dept of Ag. doing their job of regulating use of poisons and protecting the people and 'aina. You can stop tourist from carrying fruit but you pave the path for poison sprayed without responsibility. I get sick from the heavy pesticide use - swelling eyes and burning lungs - imagine what it is doing to our keiki. Please don't allow these multinational chemical companies to continue poisoning us.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: ggexcavations@hotmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:41:24 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Lisa Kirbin	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: lorihiga@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 3:28:11 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Lori Nakamura-Higa	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: lynhowe1946@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Wednesday, March 27, 2013 8:38:56 AM

HB673
Submitted on: 3/27/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Lyn Howe	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: hokuokekai50@msn.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 8:37:16 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Mary Lacques	Individual	Support	No

Comments: Testimony in strong support of HB673 with amendments to require notification to residents and to revise the rules to be regulated as such because the more stringent and comprehensive the bill, the more beneficial it will be for all inhabitants of the islands. Hawaii needs to establish a baseline for understanding what types of pesticides are being applied to schools, public parks, and agricultural lands. I am also concerned that bee populations, including our thriving Queen Bee cultivation are being affected by the pesticides categorized as neonicotinoids, which are used for seed treatments in genetically engineered crops. I support the original comprehensive nature of this bill, in particular the analysis of the trends in pesticide usage and the summary and compilation of health complaints from the public.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: marybarter@me.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 6:24:05 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Mary M. Barter	Individual	Support	No

Comments: Although this bill has been so watered down as to protect almost no one, I have to strongly support it. Hopefully we can get some serious legislation next year to protect the health of our citizens likely to come in conatct with toxic ag. chemicals. This bill should provide advance notice to residents and neighbors and rules should account for drift. Also we should know what and how much and when and in what combinations they are spraying our aina, Why this should be a problem to pass something like this one can only wonder.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: michaelhawthorne1@me.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:43:05 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
michael hawthorne	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: missivonkouma1@live.fr
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:43:45 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
missy kouma	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: foodsovereigntynow@gmail.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 9:08:15 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Mitsuko Hayakawa	Individual	Support	No

Comments: As a mother of three children, I am extremely concerned about the use of pesticides, especially near homes and schools. I strongly support this bill WITH AMENDMENT to require notification to residents and revise rules and regulated to such. Thank you for hearing this bill.

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From: mailinglist@capitol.hawaii.gov
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Cc: mondiaux@msn.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:43:27 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Mondiau Simmons	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: pattio57@mac.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Wednesday, March 27, 2013 8:51:18 AM

HB673
Submitted on: 3/27/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Patricia Osborne	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: silverpenny10@hotmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:38:45 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
penny silva	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: ponosize@hotmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 8:44:16 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Pono Kealoha	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: amsray@heartofhawaii.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 7:07:20 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Ray Foster	Individual	Oppose	No

Comments: Please accept my testimony in OPPOSITION to HB673. Relevant information regarding the application of all pesticides APPROVED by the State of Hawaii and the EPA is readily available as public information in the product labels and Material Safety Data Sheets. HB673 is simply another hysterical attempt to prejudice legitimate and legal agricultural businesses. Please bring common sense and fact based decision making back to our legislative process. Kill HB673. Respectfully submitted. RJF

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: samanthacresanto@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:39:31 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
sam cresanto	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: sarahkauai@yahoo.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 9:56:27 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
sarah smith	Individual	Support	No

Comments: strong support with amendments to require notification to residents and revise rules and regulated to such I think we are already overloaded with chemicals on out fields here.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: shannonkona@gmail.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Wednesday, March 27, 2013 8:56:40 AM

HB673
Submitted on: 3/27/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Shannon Rudolph	Individual	Support	No

Comments: Strong support with amendments to require notification to residents and revise rules and regulated to such.

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: sherrianwitt@aol.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 7:50:37 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
sherrian witt	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: davidsher@juno.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Tuesday, March 26, 2013 10:33:29 AM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Sherry Pollack	Individual	Support	No

Comments: I would like to voice my support for a Hawaii pesticide registry HB673 that we might willfully track the effects of pesticides in Hawaii. HB 673 will help to establish a baseline understanding of how much and what types of pesticides are being used in our state. I also urge you to amend this bill to require notification to residents. Of particular concern, and one of many reasons why this pesticide registry is so important, is the effect pesticides are having on our bees. Beekeepers worldwide are concerned about the myriad of pesticides being used in so many places. Hawaii is the world's leading exporter of Queen bees, and the bees are unable to find their way back to the hives upon pesticide exposure, resulting in bee Colony Collapse Disorder. Without bees we have no food. It's that simple. We must do something to become better stewards of the land and ensure a future for our children. We are counting on you. Mahalo, Sherry Pollack Kahaluu

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: grumpyscosmos@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 9:25:13 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
steve scott	Individual	Support	No

Comments:

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Cc: suphamsaigon@yahoo.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:39:14 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
sue phalen	Individual	Support	No

Comments:

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Cc: suyng07@sbcglobal.net
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:39:54 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Suy Nathan	Individual	Support	No

Comments:

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Cc: alohalways@gmail.com
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Tuesday, March 26, 2013 11:11:21 PM

HB673
Submitted on: 3/26/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Tanja Miller	Individual	Support	No

Comments:

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: taterrocks@socket.net
Subject: *Submitted testimony for HB673 on Mar 28, 2013 09:05AM*
Date: Monday, March 25, 2013 10:44:07 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Tatiana Rocks	Individual	Support	No

Comments:

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HB673 Pesticide bill The committee(s) on WAM on 03-28-13 9:05AM in conference room 211.

Aloha Chair of the Ways and Means and Honorable Committee,

Thank you for the opportunity to testify.

This bill has been greatly morphed from its original purpose which is to reduce the negative impacts of pesticides on public health and the environment through an accurate and detailed collection of pesticide use data that will allow for adequate and scientific assessments of potential health problems related to pesticide exposure.

Amend this bill, please.

Regarding the freedom of Information act arguments:
The omission of this "notification right of the public" within the posting of forms in the current bill weights heavily on the side of industry given the balance measurement used in the Freedom of Information act 97- F with harms to the public.

Regarding biotech companies and pesticide companies claims of need to avoid harassment and need for biosecurity to protect confidentiality and privacy. Agricultural companies on our islands have had the ability to put up security cameras, electronic fences, sound devices, tall tree barriers, and only are required to give notification by sign for the protection of their workers. This does not account for pesticide drift to either adjoining neighbors or wider spread pesticide drift. and is not addressed in our law and regulations. Even if there are claims that farmer post a sign, most may not even see it. The chemicals being used whether restricted used pesticides, general use pesticides are still poisonous. Whether glyphosate, glyphosate derivatives or inerts such as POE, I understand still may be considered by the FDA "general use" even though they are being sprayed in "layers" with atrazine (once banned in the US, and reapproved for use), and definitely in some other countries still) and other products are sprayed over this but still are considered novel new pesticides that are stronger and more hazardous but not reclassified. Small Farmers can certainly be required to send letters to addresses obtained from property tax record website or obtain phone numbers of neighbors and give a required call or letter regarding spraying. Further pesticide companies can require before spraying that businesses and homeowners notify adjacent neighbors of spraying: time, date, location. Rather than it be a negative, they could put it out as "preventive measures" rather than a stigmatism.Small Farmers can certainly be required to send letters to addresses obtained from property tax record website or obtain phone numbers of neighbors and

give a required call or letter regarding spraying. Further pesticide companies can require before spraying that businesses and homeowners notify adjacent neighbors of spraying: time, date, location. Rather than it be a negative, they could put it out as "preventive measures" rather than a stigmatism.

Let's look at the other side of the information protectionism balance. What protection do we have as residents? NO written notification to residents, or public facilities, no requirement for companies to post registries on their sites to do robo calling, text message or email prior to pesticide spraying, or written notification, no registries to sign up on to request notification of pesticide spraying. What protection to children or other outdoor workers have? . HC and Sugar has provided this for cane burning voluntarily. However, this has NOT occurred with any pesticide spraying on agricultural land or pesticide use with any company I know of in Hawaii. We must be able to get out of harms way and know when to close windows, doors, turn on air purifiers, put on protective clothing when outdoors and protect our children and pets.

Article XI of the Hawaii Constitution under Environmental Rights, Section 9, says, "Each person has the right to a clean and healthful environment…"
Hawaii's lack of notification requirements to the public by the state of HI could be considered in violation of that act by omission given the outcry of the public and lack of response. Attempts by industry to remove health and life from county legal responsibility recently was deplorable.

I urge you to right this balance in the Freedom of Information Act. Pesticide use companies and growers who use poisons should accept the burden of precaution and notification. Health is extremely expensive to fix regarding the level of toxic burden at play and the public has no defense from it to get out of harms way without reasonable notification.

HB673 bill frankly currently looks more like a minimal house keeping bill that doesn't even meet the minimum standards for providing protection to its people. The HRS149A and AR-66 Pesticide Laws and Rules are greatly outdated, and do not provide sufficient disclosure and notification to residents to prevent harms. As confirmed by one of your education specialists, posting of signs is really for pesticide workers, not really geared toward neighbor protection. **There is NO notification requirements in our pesticide law and regulations to protect the public.** There is only protection for pesticide workers spraying and a sign for such unless noted on a pesticide label. Any sign posted on the edge of a property is not likely to be seen by neighbors at any rate which does not take into consideration unintended or even minimal drift to adjacent properties subject to direct and accumulative effects of harm. The toxic burdens on humans, bees, birds, and soils, is well known by both general use, restricted use, and unknown by test crop spraying of layered pesticides.

1. The state could save substantial funds by utilizing a requirement of notification procedure and buffer zone protocol to reduce harm, save the state having to investigate myriad complaints, and do expensive testing.

2. The burden should be on the pesticide use industry to provide required notification and meet requirements on buffer zones.

3. The state should meet reasonable requirements of other states already providing these notification and buffer zone requirements.Note State by State Summary of Comparison of Pesticide Notification to Residents and Buffer Zone Regulations, Rules and Laws as posted on http://www.beyondpesticides.org/infoservices/Regulations.php and enclosed.

4. **AMEND THE WORDING ON REPORTING TO INCLUDE**
In the list of forms required to be posted that the state of HI should make public would be a report form showing "notification disclosure requirements and notification protocol by pesticide users regarding intended time frame, date and location of pesticide spraying by growers, companies and neighbors to protect adjacent properties, other neighbors, and the public from both unintended and potential pesticide drift."

5. State" AG division to **review its outdated HRS Pesticide Laws and regulations HRS149A and AR- 66 and meet notification to residents and public facilities and buffer zone requirements that other states provide already**!. Note State by State Summary of Comparison of Pesticide Notification to Residents and Buffer Zone Regulations, Rules and Laws as posted on http://www.beyondpesticides.org/infoservices/Regulations.php and enclosed.

6. Post this on the website.

Many states:
1) requires specific notification requirements to residents and public facilities in alignment with states that already have existing notification requirements on lawn and turf spraying, test crops, aerial spraying, buffer zones, and pesticide sprayers.

2) to require notification registries on the state pesticide control sites for "self initiated registries" and "non-ag registries", which is easy and cost effective to do if you note California, Maine, Michigan, Wisconsin, New York Pesticide Control Program State Websites which I have already researched. Choose one and amend later. They are similar. Just note that in the last 5 years with public requesting response, there has been no movement on the pesticide revisions to meet their needs of protection.

"Notification Requirements for Pesticide Applications by State"

"Buffer Zone Requirements for Pesticide Applications by State"

Me ka pumehana,

Unmani Cynthia Groves
Health Care Practice Management Consultant to Professionals since 1985
Alliance of Maui Community Associations
Kihei Community Association Planning Committee
SW Maui Watershed Advisory
Halau Ke'alaokamaile

"Notification Requirements for Pesticide Applications by State"
"Buffer Zone Requirements for Pesticide Applications by State"

Regulations, Rules and Laws as posted on http://www.beyondpesticides.org/infoservices/Regulations.php

Notification Requirements for Pesticide Applications
A Beyond Pesticides Fact Sheet

State	*Application Type*	*Notification Type, Application Distance*	*Site*
Alaska	Not specified	Notification by phone, orally, email, or mail	Schools
Arizona	All applications	Notification of staff and parents	Schools
	Lawn application	Incident notification and pre-application notification	All property owners
Arkansas	Commercial agricultural application	Notification by letter five days in advance, or written permission by the grower	Susceptible crop growers
California	Aerial application, phenoxy herbicides, timber production	Post sign, 1 m.	All property owners
	Aerial application, phenoxy herbicides, timber production	Mail notice, 300 ft.	Residents requesting notice
	Methyl Bromide Fumigation	Signs in Spanish and English 25 ft. out	Agricultural areas
	Application for commercial or research production of agricultural commodities	Notification orally or in writing	Property operators
	Permitted operators	Prior notice	Adjacent property owners
	Bee-sensitive application	Opt-in notification	Bee-keepers
Colorado	Turf or ornamental application	Posted sign, and notification	Notification for those on the r sensitive individuals
Connecticut	Restricted use pesticide	Posted sign.	Neighboring property
	Aerial application	Written consent, 200 ft. (helicopter), 300 ft. (fixed wing)	Landowners and residents
	Landscape application	Written notification for registered individuals	Schools
DC	All applications	Posting requirements	All property owners
Florida	Turf and ornamental, non-agricultural application	Notification	Adjacent or contiguous prope physicians
Georgia	Landscape application	Posted signed	All property owners
Hawaii	Highly toxic pesticide applications	Posted signs	Treated areas
Illinois	Lawn application	Notification after spray	On site
	Landscape application	Written notification for registered individuals or notification to all individuals	Schools, day care centers
	Commercial pesticide application	Notification	Registered sensitive crops
Indiana	Lawn application	Notification	On site

	Commercial application	Notification	Registered sensitive crops
Iowa	Pesticide application	Notification Signs	Public highways, roads, stree recreational trails
	Bee-sensitive application	Prior notification	Registered bee-keepers and th
	Commercial or public pesticide application	Notification Signs	All urban areas
	Commercial or public pesticide application	Notice	Registered individuals on the hypersensitive list
	Lawn, park, playground and athletic field applications	Written notification for registered individuals	All urban areas
	Golf courses	Written notification	All urban areas
Kansas	Commercial application	Notification	Sensitive crops including co and nut trees
Kentucky	All applications	Written notification (not required if it is not in session)	Schools and health care facili
	All applications	Written notification	Registered neighbors
	Turf application	Posted signs 4*5 inches	Golfing areas, turf areas
Louisiana	All applications	Notifications	Registered individuals on the hypersensitive list
	Commercial or PCO	Notification	Adjacent neighbors or those v
Maine	All applications	Those within 500 ft. of a sensitive area may request to be notified, notification in any fashion	Residential buildings, scho athletic fields, comm worship, recreationa
	Ornamental or turf pesticide application	Notice	Registered pesticide sensiti
Maryland	All applications	Notice	Registered pesticide sensiti
	Lawn application	Notification	Adjacent or contiguous pro
Massachusetts	Aerial applications	Post sign, 500 ft.	Residential, commercial, schools, gathering p
	All applications	Notification	Registered pesticide sensiti
Michigan	Turf and ornamental, non-agricultural application	Written notification, personal contact, or advertisement through a newspaper	Property owners, agents, or
	All applications	Notice	Registered pesticide sensiti
Minnesota	All applications	Notice within 48 hours	Neighboring properties
	Commercial pesticide application	Notification	Registered sensitive crops
Missouri	All application	Notification	Sensitive crops
Montana	Commercial application	Notification	Sensitive crops including legumes, grapes and
Nebraska	Commercial pesticide application	Notification	Sensitive areas including b grapes, tomatoes, nu
New Hampshire	Aerial application of pesticides	Notification requirement	Residences within 200 ft. o
New Jersey	Aerial applications	Written consent, 100 ft.	Private residence
	Bee-sensitive pesticides	Notification	Registered beekeepers with target site
New York	Commercial lawn applications	Notification based on an opt-in strategy	Written notification for ow family dwellings
North Carolina	Pesticides applications	Notification	Registered beekeepers with the application site
Oklahoma	Commercial application	Notification	Registered sensitive crops
Oregon	Forest application	Notification	Forested areas
	Commercial and lawn applications	Posted signs	Residential areas
Pennsylvania	All applications	Registry, contiguous land	Residence
	Commercial application of non-agricultural site	Notification	Adjacent property owners
	Commercial or public pesticide application	Notification	Registered pesticide-sensiti ft. of target site
	Restricted use pesticides	Notification	Residents and neighboring
	All applications	Notification	Schools
Rhode Island	Commercial application	Posted signs	Residential areas
	Commercial application	Notification	Registered individuals
	All applications	Written notification	Registered individuals in
South Dakota	Commercial application	Notification	Registered sensitive crops a
Tennessee	Ground application	Notification	Registered bee keepers

Texas	Air blast and mist blowing applications	Request notification, 1/4 m	Daycare, schools, hospitals those with chemical work.
	Indoor application	Posting	Rental properties
Vermont	Pesticide application to flowering crops	Notification	Apiaries, who must then re them
	Turf grass and landscape pesticide application	Posted signs	All areas
Virginia	Commercial application	Posted signs	Residences with landlords associations
Washington	Landscape and right-of way applications	Public notice and individual notice for those on registry	Neighboring abutting prop
West Virginia	Commercial application	Notification (no specified means)	Not specified
	All applications	Notification for registered individuals	Schools
Wisconsin	Commercial application	Notification	Registered sensitive crops
	Turf and ornamental, non-agricultural	Notification	Neighbors on the same blo registered individua
Wyoming	Commercial application	Notice, posted signs	Schools

Buffer Zone Requirements for Pesticide Applications
A Beyond Pesticides Fact Sheet

State	*Application type*	*Dimensions for Buffer*	*Sites*
Alabama	Aerial application	400 ft.	Schools, hospitals, nursing
	Regulations prohibit drift only when there is damage	None specified	
Alaska	Aerial application	200 ft. (surface water drinking source); 35 ft. (other waters)	Forest management project
	Regulations prohibiting drift for off-site damage	None specified	
Arizona	Certain odiferous pesticides	1/4 m.	Schools, daycares, health care residences adjoining field
	Certain highly toxic pesticides or paraquat	400 ft.	Health care institutions
	Certain toxic liquid pesticides	100 ft. (aircraft) or 50 ft. (ground)	25+ residences adjoining field
	Aerial application, certain highly toxic pesticides	300 ft.	25+ residences adjoining field
	Certain highly toxic pesticides	1/4 m.	Schools, daycare centers.
Arkansas	Aerial application of restricted pesticides	1 m. to 4 m. depending on the wind speed and direction	All Arkansas
	Ground application of restricted pesticides	1 m. to 1/2 m. depending on wind speed and direction	All Arkansas
	Application of restricted use herbicides	Zoning requirements based on wind speed, crops, distance to canopy etc.	
California	Ground application	1/4 m.	Schools
	Methyl bromide fumigation	300 ft.	Schools, residences, hospitals onsite employee housing
	Aerial application of most pesticides	300 ft.	Salmon supporting waters
	Ground application of most pesticides	60 ft.	Salmon supporting waters
	Pesticide management zones	1 mile square	Areas sensitive to groundwat
	General prohibition against non target damage	None specified	
Connecticut	Dust pesticides	100 ft.	Public highway
	Aerial application	1/2 acre	Municipal or private owned p swimming areas.
Florida	Aerial application of organo auxin herbicides	Up to 2 m. downwind	Susceptible crops
	Ground application of organo auxin herbicide	Up to 1/2 m. downwind	Susceptible crops
	Restricted use applications	300 ft. or 1000 ft.	Wells used for human consun extended
Idaho	Ground application	None given	Around homes and gardens
	Highly volatile ester formulations	5 m.	Susceptible crops or hazard a
	Low volatile ester	1 m.	Susceptible crops or hazard a

	Aerial application of some restricted chemicals like parathion	1/2 m.	Hazard areas, canyon breaks a River drainage
Illinois	Ground application of fertilizers	3 ft.	Waterways
Iowa	Aerial or ground application	25 ft. to 30 ft.	Susceptible crops
	Atrazine application	100 ft.	Well, cistern, sinkhole, strean impoundment
Kansas	Judicial decision prohibits offsite damage from drift, no regulations	None specified	
Louisiana	Commercial aerial application	100 ft. or 1000 ft.	Inhabited structures or school hours
	Aerially and ground application of 17 pesticides	2 m. downwind to 5 ft. upwind	Inhabited residences and susc
Maine	Ground broadcast	25 ft.	Waters of the state
	Regulations prohibit unconsented, off-target direct discharge of pesticides	None specified	
Maryland	Regulations prohibit damage non-target areas or organisms	None specified	
Massachusetts	Aerial application	150 ft.	Protected areas such as homes recreation areas
	Aerial application	400 ft.	Public surface water supply
	Granular pesticide application	50 ft., or 250 ft.	Protected areas such as homes recreation areas. Or public su
	All pesticide application	50 ft.	Non-agricultural areas
	Herbicide application	50 ft., 100 ft.	Private drinking water supply area
Michigan	Requires off-site damage be minimized; buffer zones applied when off target drift anticipated	Not specified	
Minnesota	Prohibits off-site damage by statute	Not specified	
Mississippi	Aerial application of phenoxy-type chemicals	1/2 m.	Susceptible crops
	Drift not causing off-site damage is not defined as drift in Mississippi	Not specified	
New Hampshire	Non professional application	25 ft.	Surface waters
	Pesticide application	400 ft., or 250 ft.	Gravel packed wells used for other wells
New Jersey	Aerial application	100 ft. for general use pesticides with a warning label, otherwise 300 ft.	Occupied schools, hospitals, r religious worship, business or
	Gypsy moth application	2 m. or 2.5 m.	Grade schools or high schools
	Aerial application	Regulations prohibit application on less than 3 contiguous acres (rotary wing aircraft); less than 10 contiguous acres (fixed wing aircraft)	Non-agricultural areas
	Regulations prohibit all drift that is avoidable by reasonable precautions	None specified	
New York	Any application	100 ft.	Wetlands
	Any application	On site	Schools, daycare centers for p playing fields.
	Any application	50-100 ft.	Susceptible crops and waterw
	2,4 D and 2,4,5, T application	Variable by ruling	More than 10 grape growers t evidence of damage
North Carolina	Aerial application	300 ft.	Occupied schools, hospitals, r worship, business or social bu
	Aerial application	25 ft.	Public roads
	Aerial application	100 ft.	Residences
	Regulations prohibit drift from pesticides that result in adverse effects from aerial or ground application	None specified	
Ohio	Regulations provide that weather conditions may prevent the application due to drift	None specified	
Oklahoma	No regulations for drift, but there is a rule of strict liability for aerial	None specified	

	application		
Oregon	Aerial applications of 8 pesticides Ground applications of 8 pesticides All applications	300 ft. 60 ft. 60-100 ft.	Salmon supporting waters Salmon supporting waters Aquatic areas
Pennsylvania	Restricted-use pesticide applications	100 ft.	Designated protected areas, p designated
	Regulations prohibit applications when weather conditions causes drift off-site	None specified	
Rhode Island	All applications	400 ft. or 250 ft.	Gravel packed wells, public w wells
Utah	Regulations prohibit application causing run off or drift from the target area causing damage.	None specified	
Vermont	All applications	50 ft.	Private water wells
Washington	Aerial application of most pesticides Ground application of most pesticides Judicial decisions have prohibited off-site damage by applicators	300 ft. 60 ft. None specified	Salmon supporting waters Salmon supporting waters
West Virginia	Aerial application of picloram or Dicamba	100 ft.; 150 ft.; 150 ft.; 50 ft.	Public recreation areas; reside outside building; and roads
	Aerial application of other herbicides	150 ft.; 100 ft.; 150 ft.; 50 ft.	Public recreation areas; reside outside building; and roads
Wisconsin	Aerial application	1/4 m.	Residences that have requeste
	Aerial application	Post notice, 300 ft.	Residence, labor camp, schoo health care, commercial or in recreation area

From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: tehaloha@yahoo.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 9:25:54 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
tehemina bradfield	Individual	Comments Only	No

Comments: strong support with amendments to require notification to residents and revise rules and regulated to such

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From: mailinglist@capitol.hawaii.gov
To: WAM Testimony
Cc: valerie@isomedia.com
Subject: Submitted testimony for HB673 on Mar 28, 2013 09:05AM
Date: Monday, March 25, 2013 8:41:12 PM

HB673
Submitted on: 3/25/2013
Testimony for WAM on Mar 28, 2013 09:05AM in Conference Room 211

Submitted By	Organization	Testifier Position	Present at Hearing
Valerie Barnes	Individual	Support	No

Comments: Amend this to require notification of residents who will be exposed.

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