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Foresight

Analysis

Trouble
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Strategy

Joint Fact Finding Study Group on Genetically Modified Crops and Pesticides on Kauai

Update #2

April 15, 2015

1. Recent Activities

As one starting point for its inquiry, the JFF group has gathered together a preliminary list of claims by both skeptics and defenders of pesticide use by GM companies. The list, a work in progress, can be found at Annex-1 of this update. Over the next several months, factual information will be sought to try and better understand the claims and counterclaims that have been made. Proposed additions to this list can be sent to padleraccord@gmail.com. Meanwhile:

- **March 6, 2015.** A meeting in Kekaha with interested members of the community was held to hear more specifically and first-hand the concerns about pesticides and possible health implication from local residents. Approximately 35 community members attended the meeting convened by Board of Agriculture Chairman Scott Enright along with JFF study group members Drs. Lee Evslin and Douglas Wilmore and Project Team member Dr. Bruce Anderson. Ph.D.
- **March 7, 2015.** The initial organizational meeting of the JFF Study Group was held. It began with a blessing by Sabra Kauka followed by appreciations from Mayor Bernard Carvalho and Board of Agriculture Chairman Scott Enright. Following further introductions by the nine members of the Study Group and the Project Team, the group refined its mission, goals and objectives; exchanged ideas on the issues under examination; and signed a Charter of Commitments which is posted at <http://www.accord3.com/pg1001.cfm>.

- **April 9, 2015.** Members of both the JFF Study Group and the Project Team participated in a field trip to Dow AgroSciences and DuPont Pioneer to better understand the pesticide storage, mixing, record keeping and applicators. Representatives of other seed companies were also present to discuss similarities and differences in their operations.
- **April 10, 2015.** The second meeting of the Study Group was held. This session was the first of a series of “Listen and Learn” meetings with invited local guests. In attendance to explore specific factual questions posed by the group were Milton Clark, a former EPA environmental scientist; Dr. Dileep Bal, Department of Health (DOH) District Health Officer; Gary Ueunten, DOH Environmental Health Specialist, Ann Kam, Kauai Enforcement Inspector for Hawaii Department of Agriculture; Jeri DiPetro, Founder of SEED; Carl Berg, Research Scientist for Surfrider Foundation; and Malia Nobrega-Olivera, Hawai‘inuiakea School of Hawaiian Knowledge.

2. Current and Planned Activities

Having completed its initial organizational work, the JFF is currently gathering studies and reports in three areas: Kauai’s agricultural and pesticide “footprint”; Kauai’s health status; and indicators of environmental problems that may have links to pesticide and herbicide use. Over the coming months, additional “Listen and Learn” sessions will be scheduled. Persons interested in having members of the JFF visit with their groups should contact:

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Annex-1

Assertions about GM Agricultural Pesticides on Kaua'i as Part of its General Fact-Finding Work

Background

The JFF Study Group continues to gather together assertions and claims made by both critics and defenders of GM agriculture on Kaua'i. Our overall mission is to address the following:

- a. Are there detectable and measurable human or environmental health impacts on Kaua'i associated with GM crop production?
- b. If we believe the answer to the above is a possible "yes", what are the documented health or environmental impacts on Kaua'i and how strong is the evidence?
- c. If the evidence suggests a possible "yes" to the above, what should be done?

Collaterally, and in conjunction with the above, we will examine whether management and oversight activities, including pesticide storage, mixing, and spraying is sufficiently monitored and enforced on Kaua'i and if regulatory controls are effective in protecting human and environmental health while still supporting agricultural production.

Skeptics and defenders have laid out a variety of public assertions. We have gathered and consolidated some, perhaps even many of them, though the table isn't complete. From the statements made about the pesticides used by GM operations, the JFF team is combing through a variety of empirical data sources, both reports and higher quality published studies, to understand the evidence that exists. The middle column on this table will provide points of information gathering, review, and deliberation. This draft remains a work in progress.

Item	Claims from GM Skeptics	Potential “Fact” Questions for JFF	Claims from GM Defenders
1. VOLUME OF PESTICIDE USE			
1-1	<p>VOLUME. GM companies on Kaua‘i are using massive amounts of Restricted Use Pesticides (RUPs) on GE crops. (As much as 18 tons per year). GM companies apply pesticides more frequently per acre per year than other forms of agriculture on Kauai and elsewhere.</p>	<p>How does the amount of pesticide used by GM companies compare to other agricultural, commercial, industrial, and residential use on Kaua‘i?</p>	<p>VOLUME. GM companies use less pesticide (RUPs) than other sources including the county, fumigators, hotels, golf courses, and home users. Companies use the minimum amount needed to control the particular pests involved. The EPA also limits the quantities of many RUPs that may be used on a per acre, per crop, or per season basis. Farming practices and environmental conditions are very different in Hawaii vs mainland areas, resulting in different types of pesticides being used. California growers actually use significantly higher amounts of RUPs on their high-value crops.</p>
1-2	<p>INBRED VARIETIES. GM seed corn requires more pesticides because it is less vigorous and more vulnerable to stress and pests than hybrid corn is.</p>		
1-3	<p>INTENSITY: Dupont–Pioneer sprays pesticides on 2 of every 3 days for the year and makes on average 8.3 – 16 applications per application day (Jervis and Smith 2013). This intensive spraying far exceeds anything found on the mainland.</p>		<p>Farming practices and environmental conditions are very different in Hawaii vs. mainland areas, resulting in different types of pesticides being used. California growers actually use significantly higher amounts of RUPs on their high-value crops.</p>

2. ENVIRONMENTAL IMPACTS

- 2-1 **PESTICIDE BINDING.** Pesticides from GM crops bind to particles in Kaua'i's soils and waters.
- 2-2 **GLYPHOSATES LONGER LIFE.** Glyphosate binds to clay, dust and organic matter and persists longer than advertised.
- 2-3 **BEE IMPACTS.** Neonicotinoid-coated GMO seeds produced on Kaua'i are killing bees on Kaua'i. These have been banned in Europe. Some RUP labels indicate that they can be harmful to bees and should not be sprayed under certain conditions. Pesticides can accumulate in bee colony wax and combs creating a constant supply of A.I.s to be ingested.

Compared to earlier types of herbicides used in agriculture, glyphosate is much less toxic, is applied in lesser quantities, and has a shorter half-life.

Bee colony collapse causes are not entirely conclusive, and several factors are likely involved. The Varroa mite is a known predator for bees, and some colonies on the mainland have suffered from overworking on different agricultural crops. Australia uses neonicotinoids in their agricultural sector and has not suffered bee colony collapse. Australia also does not have the Varroa mite.

2-4 **PESTICIDE USE CREATES NEW BUGS AND WEEDS.** The pesticides in use on Kaua'i are causing the creation of unstoppable superbugs and super-weeds that are evolving to withstand chemical spraying. In turn, these require new and greater amounts of herbicides and pesticides.

2-5 **NEAR SHORE WATER CONTAMINATION**
Shoreline waters and corals may be affected by pesticide runoff.

2-6 **SEA URCHINS.** Kaua'i's near shore sea urchins are dying as result of GMO pesticide use.

Herbicide tolerant weeds are not new. They are controlled by either another herbicide with a different mode of action or by tillage. Glyphosate is in sixth place among herbicide groups in terms of the number of resistant biotypes, behind chlorsulfuron, atrazine, diclofop-methyl, 2, 4-D and paraquat. Herbicide resistant weeds are not unique to farming with GE crops, having arisen in the late 1950s, some 40 years before GE crops. Minimizing their occurrence and economic impact is important and a part of good agricultural management. The major organic pesticide in common use by GE and organic operations is Bt. To date, the incidence of Bt resistance remains low with emphasis on abundant refuges and multiple-trait Bt crops.

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3. PESTICIDE DRIFT

3-1 **PESTICIDE DRIFT.** GM companies on Kaua'i aren't taking sufficient precautions to prevent pesticide migration.

PESTICIDE DRIFT Companies on Kaua'i utilize appropriate technology to minimize drift (e.g., nozzles on spray to increase droplet density). Companies want to minimize drift as well, for health, environment, and economic reasons. Use of RUPs decreases the probability of drift and bystander exposure because applicators must be trained and supervised by certified, licensed professionals. Pesticides are formulated to maximize adherence to targets and minimize drift. Trace amounts of many chemicals, including pesticides, may be found in dust particles in the atmosphere, but there is no credible evidence to indicate these amounts pose a health hazard. Extensive air testing in California and Hawaii confirm that pesticides are not often found in the ambient air and, when they are, they are well below health hazard levels of concern.

- 3-2 **INAPPROPRIATE SPRAYING.** Sometimes the companies spray at night so the pesticides won't dry as quickly. Companies also spray when it is windier than allowed and there are pesticides being found off property.
- Have there been any reported incidents of pesticides being applied when wind speeds exceeded what the specific pesticide label allows?
- Sometimes a spraying schedule overlaps with nighttime hours when it must be done early in the morning or late in the afternoon. There is also often less wind at night, which decreases the potential for drift. Certified RUP applicators are trained licensed and must follow all label instructions, including those pertaining to maximum wind speeds. There have been no findings of pesticide concentrations in air or soil that exceed federal or state standards. The DOH 2013 Stream Study found traces of Atrazine and Metolachlor that slightly exceed EPA's aquatic life benchmarks, but are below regulatory standards.

4. PESTICIDE EXPERIMENTATION

- 4-1 **PESTICIDE "STACKING" AND MULTIPLIER EFFECTS.** Different pesticides are often used in combination with each other creating unknown interactions with each other and adding to the complexity of human and environmental exposures.
- New pesticide mixtures are tested before they are applied. Pesticides are designed to avoid off-site movement, and mixtures of different pesticides are not more likely to drift than single types of pesticide applications.
- 4-2 **EXPERIMENTAL PESTICIDES.** The companies on Kaua'i are using unknown and unregistered "experimental" pesticides.
- EXPERIMENTAL PESTICIDES** Companies have never used "experimental" non-EPA approved pesticides on their crops. The Experimental Use Permits request the use of already-approved pesticides to be used on crops they were not originally intended for (e.g., a pesticide approved for walnuts used on coffee plants). There are relatively few Experimental Use Permits needed each year.

4-3 HAWAII IS “GROUND ZERO” FOR OPEN AIR TESTING OF EXPERIMENTAL PESTICIDES.

Pesticides are sprayed any time the companies choose and there are no buffer zones. Seed companies take experiments with herbicide- and pesticide- resistant organisms straight from the lab to the fields for pesticide and herbicide testing.

4-4 QUANTITY OF GM TRIALS Since GE testing began, over 3,000 permits have been granted by USDA for field trials of GE crops in Hawaii, more than any other state in the nation

LABEL IS THE LAW Companies on Kaua’i follow all of the protocols set out by EPA for spraying pesticides. Growers must first apply for and receive an Experimental Use Permit (EUP) from the Hawaii DOA before testing any EPA approved Active Ingredients on new types of crops on plots over ¼ acre. The DOA approves an average of less than 5 EUPS in Hawaii each year. Companies plant vegetative barriers and “cover crops” around their crops. Companies are sensitive to their neighbors, including spotters when they are spraying, in-house weather tracking, and installing control technologies in their equipment.

QUANTITY OF GM TRIALS. Hawaii narrowly leads the nation in the number of field trials, with a total of 3,243 since 1987. The next closest locations are Puerto Rico with 3154, Illinois with 3049, and Iowa with 2768.

5. OVERSIGHT AND REPORTING

5-1 DISCLOSURE. The seed corn companies on Kaua’i won't disclose where and when they are using pesticides because (a) it gives away proprietary business information (“CBI”) and (b) it invites vandalism and sabotage from opponents.

DISCLOSURE. Kaua’i’s seed corn companies are voluntarily disclosing the amount of pesticide and herbicides used on the island through “Good Neighbor” Program. Kaua’i’s seed corn companies also disclose information to any regulatory bodies that request it (e.g., Department of Agriculture, during inspections). Posting signs before spraying is impractical because weather conditions can't be predicted with assurance that far in advance.

- 5-2 **OVERSIGHT.** Federal and state oversight of the pesticides being used by GM operations is less rigorous than for other agricultural operations.
- 5-3 **REPORTING.** Many people on Kaua'i, especially on the West side, won't report health problems because they don't trust the complaint receiving agencies.

OVERSIGHT. EPA is rigorous in protecting the public's health and the companies have to comply or get fined.

6. HEALTH RISKS

- 6-1 **GLYPHOSATE (ROUNDUP) ALTERS GUT BIOMES** The flora in bovine gastrointestinal tracks is affected by glyphosate that is then ingested by humans who eat meat.
- 6-2 **LONG TERM LOW DOSE EXPOSURES** Chronic exposure to low levels of pesticides suppresses immune systems and exacerbates underlying health conditions.
- 6-3 **ROUNDUP** Research by Gilles-Eric Seralini, University of Caen, found that an inert ingredient in Roundup called POEA caused human cell death at all concentrations tested.

- 6-4 **INFANT HEALTH** A recent study has linked parental exposure to pesticides with an increased risk of brain cancer in children. (“Parental occupational exposure to pesticides as risk factor for brain tumors in children and young adults: A systematic review and meta-analysis.” Van Maele-Fabry, Hoet, Lison; Louvain Center for toxicology and Applied Pharmacology, 2013)
- 6-5 **CHLORPYRIFOS RISKS** EPA phased out household use of Chlorpyrifos, but continues to allow its use on crops. This exposes rural residents to an insecticide deemed unsafe to use in households.

7. HIGHER RATES OF COMPROMISED HEALTH ON KAUA‘I

- 7-1 **TOXICITY.** On Kaua‘i, seed companies use pesticides that are more toxic than those used in conventional agriculture.
- 7-2 **RISK.** People living or working near GM test sites on Kaua‘i are at greater risk to pesticide exposure than others living further away.

TOXICITY Many household products contain the same active ingredients as the pesticides companies use. Household use outstrips the companies' use of pesticides.

7-3 **INCIDENTS.** Students and teachers at Waimea Canyon School had to be evacuated twice because of GM and pesticide-laden dust events

7-4 **LEARNING DISABILITIES AND AUTISM.** Glyphosate (Roundup) is associated with learning disabilities and autism on Kaua'i.

7-5 **GEOGRAPHIC CONCENTRATION OF HEALTH IMACTS.** Cancer, birth defects respiratory illnesses, childhood illnesses are more prevalent on the West side of Kaua'i than elsewhere on the island. Chlorophenoxy herbicides such as 2-4-D are strongly linked to Non-Hodgkins Lymphoma and low sperm counts. Imidazolinone herbicides are strongly linked to bladder and colon cancer.

7-6

INCIDENTS. A 2013 Study by UH Professor Qing Li found that a stinkweed bloom was the likely source of health concerns at Waimea Canyon School. While trace elements of five pesticides were found in the air (including two no longer in use, and found throughout the world from past uses), all were well below health concern exposure limits.

LEARNING DISABILITIES AND AUTISM. No real cause and effect has been established. Autism is a spectrum disorder and the detection levels have expanded.

CANCER. The DOH found in 2013 that there is no evidence of higher incidence of cancer on Kauai overall, or for specific geographic regions for the island, as compared to the state of Hawaii.

INFANT HEALTH. There is higher past and present drug use on the West side hence a lot of "drug babies."

8. OTHER

8-1 **ORGANICS.** Organics are purely natural and use no pesticides

8-2 **MASKING AGENTS.** Seed companies use an agent called “Big Bubble” which smells like bubble gum and is designed to camouflage the odors of other pesticides.

8-3 **FOOD SELF RELIANCE.** The GM companies operating on Kaua‘i don't grow real food.

8-4

ORGANICS. Organics also use pesticides, including forms of Bt. They are far less regulated with approvals coming from USDA, not EPA

Odors from fields are mainly attributed to fertilizers, not pesticides.

All GM seed crops on Kauai support national agricultural production, which includes foods consumed in Hawaii.

INVASIVE SPECIES: Limitations on the use of RUPs could compromise ability to contain invasive species on Kaua‘i. In particular, limitations on Experimental Use Permits could weaken the ability to combat the Coffee Berry Borer that could devastate the local coffee industry.