AERIAL SPRAYING OF PESTICIDES IN BANANA PLANTATIONS IN ECUADOR: HEALTH EFFECTS AMONG WORKERS AND SURROUNDING POPULATION

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AERIAL SPRAYING OF PESTICIDES IN BANANA PLANTATIONS IN ECUADOR

Banana plantations in Ecuador conduct aerial spraying of pesticides around 26 weeks during the year. Among the pesticides used during the spraying are Tilt, Calixin, some organophosphates and others. Aerial spraying normally occurs without previous notice to the workers and surrounding communities. In the Ecuadorian coast, where mostly bananas are grown, people live in a tropical climate with high temperatures and humidity. This makes that houses are always open to favor ventilation. If houses are closed, windows and doors are covered only with some fabric. In schools, classrooms are open as well. During or after the spraying, is common to see children playing at the playing fields. For people in the community that live in the banana areas, the options for water supply are limited. People sometimes get water in tanks from water trucks that visit the area. This water is kept in open tanks close to their houses. Another option is to use the water that flows at the edge of the banana plantations to do laundry, take showers and even to cook. Pictures 1, 2, 3, 4 and 5.

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When the spraying starts and people are not aware of it, all these areas are contaminated with pesticides.
To demonstrate the presence of pesticides coming from aerial spraying, we used the fluorescent tracer technique. This technique uses a non toxic fluorescent compound that is mixed with the pesticides they use. This technique helps to identify the presence of pesticides under UV light. Picture 6.

Before application started, we checked study subjects (workers and people from the community probably exposed) to see if they had evidence of presence of other fluorescent tracer compounds on their skin or clothes. Sometimes, soaps or detergents can be confounding factors. This procedure is known as pre-exposure study.
We followed all the process to prepare the pesticides, to mix them and then to load them on the airplane. All the preparation process was captured by photography. Four persons, two mixers, the mechanic and the guard were recruited for this study; all study participants signed an informed consent. Over all study participants, the pre-exposure study was conducted under UV light and in previously adapted room. Pre-exposure study was also conducted in nearby areas.
Results are presented in the following pictures.
For example, the mixers, the mechanic and the guard of the aerial spraying showed the presence of fluorescent tracer in clothes, neck, throat, hands and face. Despite of the use of personal protection, it is clear that it does not completely avoid the exposure to pesticides. Pictures 7, 8 and 9.

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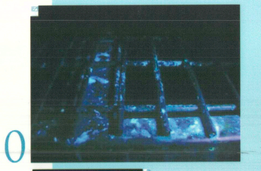
Also the workplaces, cleaned after loading the tanks of the airplane, showed the presence of the fluorescent tracer. Pictures 10, 11 and 12.



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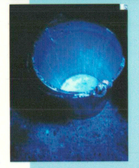

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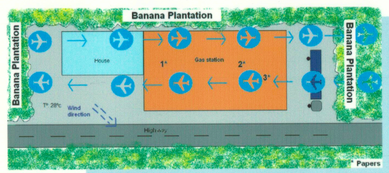

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Description of the direction of aerial spraying of pesticides in the studied area. Pictures 13 and 14.

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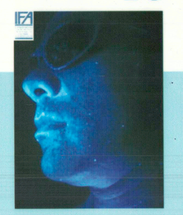

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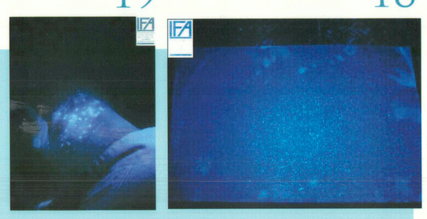
The pilot of the airplane also showed presence of the tracer. Even though is believed that pilot's cabin is hermetic when it is completely closed, these imagines showed us that pesticides came into the cabin and contaminate the instruments, the seat and the pilot. The pilot seemed to be well protected but it was found tracer in his face and neck. Picture 15, 16, 17.



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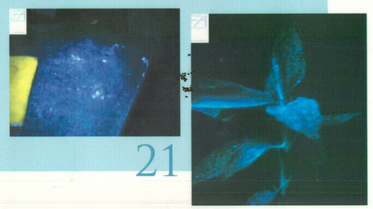
The same procedure was followed with study participants in the area that was going to be sprayed. Two participants of a nearby gas station and two residents of a house nearby to the gas station were included in the study.
After the airplane sprayed the pesticides together with the fluorescent tracer we added, workers and people living in the area that was fumigated, were checked again, post exposure study. Post exposure study was conducted again in the above mentioned adapted room under UV light. We focused attention to the changes occurred after the airplane flight in clothes and skin.
We also conducted a post exposure study in the nearby areas and surfaces of the gas station and the house next to it, at night.
The subjects of the gas station showed remains of fluorescent tracer. At the gas station, it was found areas with fluorescent tracer as well. Other examples of exposure in the gas station were found in three pieces of paper we put under the roof of the station and in two chairs, and also in the floor and the radio that the workers use to hear music. Pictures 18 and 19.



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In the house nearby the gas station it was found tracer in the back side of the house, in plants and in some animals. Inside the house we found tracer in the living room that had an open window. Pictures 20 and 21.

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People living in this house and that were in the house during aerial spraying, showed the presence of tracer on their clothes, neck and face. Their hands also showed tracer, probably because after the application they were in touch with the pesticides residues around their house. Pictures 22, 23 and 24.

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CONCLUSION

This study showed how the drift of the airplanes reach houses, people and also the workers at their workplaces out of the banana plantations. Banana workers that are doing their job or taking a break are exposed to the aerial fumigation, not only the manual fumigation. If they remain on the sites and continue to work, they are not aware nor don't they have sufficient or any personal protection.

This qualitative study is useful to confirm the exposure of the workers and population to aerial spraying. Pesticide exposure was also found when workers were studied during manual pesticides application.

WHAT IS OUR INITIAL PROPOSAL?

1) Stop aerial spraying with dangerous pesticides
2) Stop aerial spraying in living areas
3) Stop aerial spraying when workers are in the field – improve work organization and planning for spraying
4) Alert people with enough time before spraying pesticides
5) To establish a buffer area of 300 meters from the plantation to living areas to avoid people at home or children at school to be exposed to pesticides
6) Protect workers in the workplaces
7) Do not use dangerous or banned pesticides
8) Enforcement to companies to comply with rules and the best practices.
9) Availability of occupational and environmental health services to prevent and to assist workers and population in the banana production areas.
10) Strict respect to the reentry times after pesticides application according with technical recommendations for each pesticide.

We thank Dr. H. Penagos and Dr. S. Palacios for their collaboration in the dermatological study.

CLAIM FOR DAMAGES

300 workers of aerial fumigation, 12 persons whose child seems to be affected and the Municipality of Pueblo Viejo, from Ecuador began a legal demand against

CROPLIFE, Dow Chemical, Dupont, Dole, Noboa (Bonita Banana) and Wong (Favorita Fruit). They claim for health damages and, in particular they accuse them for the use of Mancozeb, considered carcinogenic by Proposition 65 of California. They also mention that EPA recommendations for the use of Mancozeb were not included in the labels and they were lying about the reentry time in the plantations treated with Mancozeb.
The process is starting and the people is very interested in its development in Ecuador and Philippines where they have similar problems.

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