1. The Origins of Aerial Spraying of Illicit Crops in Colombia

Aerial spraying against illicit crops has been rejected by all producing countries, including Afghanistan. The Colombian government is the only one in the whole world that allows and accepts this policy. Apart from Vietnam, where the United States used the defoliant Agent Orange as a weapon in its war strategy, the closest antecedent is the Israeli government’s aerial use of glyphosate to destroy Bedouin crops in what they consider to be “illegal settlements.” In these precedents, the method was used by force against civilians, as occurs in Colombia. Whereas the U.S. massacred over 5 million people in Vietnam during the war, the after-effects of Agent Orange have already left over one million babies born with terrible birth defects. Civilians continue to die, while the ones who are responsible are not brought to justice and do not even realize that the war continues.

While this is still going on in Asia, in the Middle East, the government of Israel has thrown its weight against the Bedouins in the form of Roundup (glyphosate), a product made by Monsanto, the same company that made the Agent Orange used in Vietnam and that in 1947 signed an agreement with the U.S. Department of Defence to manufacture herbicides for chemical warfare.

The Americas were not to remain free of this assault and the decision to use aerial spraying of chemicals on crops for illicit use in Colombia was made in May 1984, disregarding warnings from Colombia scientists, who said:

1. “From the standpoint of human health and environmental impact, the chemical method should be the LAST to be considered.
2. “With the existing information on the health implications and environmental impact of glyphosate, 2,4-D and paraquat, THEIR NEW, MASSIVE USE VIA AERIAL APPLICATION as proposed by the National Narcotics Council IS NOT ADVISABLE.
3. “Any method to be proposed for destroying these crops must be PRECEDED BY STUDIES ON ITS EFFECTS ON HUMAN HEALTH and on the environment.” (28 February 1984)

The veracity of this statement was reaffirmed a month later (April 1984) with the following arguments: “Glyphosate. Its aerial use is not recommended...since little is known about its acute toxicity in humans, there is no information in the literature about chronic toxicity, and there is no information with respect to either its mutagenic (gene-altering capacity) or teratogenic (causing miscarriage and malformations) effects....”

Notwithstanding, the Government of Colombia decided on 22 May 1984 to order the use of glyphosate in aerial fumigation of coca, poppy and marijuana fields. This was a political decision lacking a scientific basis, and years later it would be demonstrated that it had come about under pressure from the United States, “whose House of Representatives would finally, in 1989, endorse a proposal that would grant producing countries that are successful in the aerial eradication of their

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illicit crops the possibility of debt forgiveness from the U.S. government.”

This proposal was aimed at defusing resistance from Bolivia and 22 other countries that condemned the use of herbicides for coca eradication.

2. Substances and Concentrations used in Colombia in Aerial Spraying

In Colombia, paraquat and 2,4-D were tested for this purpose in the Sierra Nevada of Santa Marta in the 1970s, where even today a considerable number of children are born with birth defects. Imazapyr was used in Putumayo in the 1990s, leaving 53 children blind. *Fusarium oxysporum f. sp. erythroxyli* (a genetically modified fungus) has been used, which was approved by the U.S. Congress in 2005 for use in Colombia, although conducting trials with it in California is prohibited. Finally, glyphosate has been in use since 1984. Although that is what the U.S. government says, the farmers on the border, witnesses to the fumigation, have said that different products have been used, since sometimes it is a clear liquid and at other times a brown powder. Nevertheless, the National Narcotics Bureau in Colombia states that they only use the following:

- 43.9% glyphosate (commercial formulas contain 41%) as the active ingredient.
- POEA as the surfactant (which has been demonstrated to have many more adverse effects than glyphosate itself), which magnifies 22-fold the harmful effects of glyphosate on both plants and animals, by facilitating its penetration into the plant and decreasing droplet size.
- Cosmo Flux 411-F and Cosmo-In-D: products added to the previous two when it was seen that coca plants were not dying quickly; they accelerate the destructive effect on the plants fourfold.
- There are also other compounds that have not been revealed by either the U.S. or Colombian governments because of patent rights and that are part of the formulation being applied.
- The concentration that is being applied by air is from 21 to 63 times higher than that which is applied on other agricultural crops. With additives that multiply its effect fourfold, this means a 106% increase over the instructions for use in the United States for each flyover by the plane, and at times the plane flies over from 8 to 12 times.

In 1999, before Plan Colombia began, three U.S. scientists (Williams, Kroes and Munro) did an extensive review of the literature on glyphosate and concluded that “under normal conditions of use,” no health effects should be expected. However, in 2001, Dr. Penagos, a dermatologist specializing in skin lesions from pesticides, reported that glyphosate use in banana plantations causes contact dermatitis. Elsa Nivia (2001), a Colombian scientist, demonstrated that with the mixture used in spraying and at the concentration that the products are applied, fumigation is harmful to health. Likewise, in 2002, Jeremy Bigwood, an advisor to the Ecuadorean Ministry of Environment, did a literature review of 207 citations he gathered on the impact on aquatic biota and soils, concluding that:

“Neither the Colombian Government nor the U.S. Government have investigated the environmental effects of various formulas that they have been using on different ecosystems in Colombia. Such a massive use of herbicide formulas that have not been researched and

3 Nivia, Elsa. 2001. Las fumigaciones aéreas sobre cultivos ilícitos sí son peligrosas- unas aproximaciones. RAPALMIRA-University of California.
the continuous substitution of one formula for another would never be allowed either in the United States or in the majority of the countries of the world. As a result of this massive use of a formula that has not been used and the absence of research, Ecuador could well be facing a danger of unknown proportions. (...) Ecuador should protect itself with a safety strip at least 10 km wide to ensure that the chemical herbicides massively sprayed from the air dissipate within Colombian territory, in order to safeguard its citizens from their possible damaging effects.”

Following recent scientific developments encouraging the widespread use of commercial Roundup on transgenic crops, cases of acute and chronic toxicity and a relationship with non-Hodgkin’s lymphoma (NHL) have begun to appear. Studies in Uruguay (2004) of 107 cases of intoxication have found that it is absorbed through the skin and mucosa, causing neuromuscular problems and death. Relyea (2005) demonstrated that it wipes out amphibian populations. Following the latest discoveries about the death of placental cells, miscarriage and cancer, The Institute of Science in Society (ISIS) in London said the following about glyphosate:

“There is now a wealth of evidence that glyphosate requires worldwide health warnings and new regulatory review. Meanwhile, its use should be reduced to a minimum as a matter of prudent precaution.”

It is also now known that the “inert” substances used along with glyphosate are very toxic and that even the Danish Environmental Protection Agency has banned its use during rainy weather because it filters into the groundwater.

Despite all these discoveries, CICAD, the OAS drug control agency, issued a report in 2005 concluding that “the risks for persons and for human health from the use of glyphosate and Cosmo-Flux in the eradication of coca and poppy in Colombia were minimal.” This study was completely discredited by the National University of Colombia, which said that the CICAD report:

- Drew conclusions that cannot be extracted from the data presented.
- Disregarded studies critical of glyphosate that would have altered the conclusions.

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10 Ho, MW. 2005. Glyphosate Toxic and Roundup Worse. ISIS. www.i-sis.org.uk
11 Renner, R. Are pesticides “inerts” an unrecognized environmental danger? ISIS. www.i-sis.org.uk
- Studied the effects on ecosystems using few variables and did not look for biodiversity destruction, crop elimination and soil erosion.
- Did not study population impact.
- Ignored over 8,000 complaints filed by farmers about legal crops, losses of animals and health problems.

An International Mission\textsuperscript{15} that toured the border between Ecuador and Colombia in June 2005, gathered testimony from agronomists working on cacao and coffee projects in the region to discourage people from growing coca on Ecuadorean soil. The report stated that the agronomists:

“...are well aware of the effect of glyphosate since they use it frequently for weed control, and they reported that the impact of Plan Colombia aerial fumigation on vegetation, plantains, maize, and other crops in Ecuador does not correspond to the normal effects of glyphosate. The types of lesions are not typical of this chemical and from their experience as agronomists, they are sure that fumigating is being done with other chemicals that are not mentioned, perhaps with defoliants, because of the effect it has on the trees.”

As opposed to the CICAD study, which “estimated” that drift was less than 1%, a 2006 study by U.S. scientists\textsuperscript{16} found that for every two hectares of coca fumigated, one hectare of legal crops or forest was destroyed; that is, for the 150,000 hectares of crops supposedly fumigated each year, some 75,000 hectares of forest, pastureland, orchards, and coffee plantations would have been completely destroyed.

It was the recognition of this impact that motivated the American Medical Association,\textsuperscript{17} with a membership of over 6 million North American health professionals, to call for a halt to aerial fumigation throughout Colombia.

3. Irregularities in Aerial Spraying

The National Narcotics Bureau (DINE) of Colombia says that they are careful with the environment, accurate, and do not fumigate over bodies of water or farmers’ houses; however, none of this is true:

3.1 The herbicide used is not recommended for aerial fumigation

“Aerial application should be avoided if a danger exists that the chemical could come in contact with desirable species.... (...) [M]inimal quantities of this herbicide may cause severe damage to or destruction of crops and plants for which the treatment was not intended. The risk of damage from Roundup is greater when wind speeds exceed 8 km per hour” (Monsanto, Roundup user’s guide).

In addition, in aerial spraying, where the temperature is very high and fumigation is done from a high altitude, droplet volatility is very high and a large proportion vaporizes.

\textsuperscript{15} FIAN, FIDH, RAPAL, OCIM, CEAS. 2005. Observaciones de la Misión Internacional a la frontera entre Ecuador y Colombia. Agosto.
\textsuperscript{17} AMA. 2004. Resolution 420. Studying the Health Effects of Aerial Herbicide Spraying Under "Plan Colombia."
3.2 The use of planes is inappropriate
In 1988, a study requested by INDERENA (the Colombian environmental authority at the time) ruled out spraying of the herbicide from airplanes for the following reasons: 1) environmental conditions; 2) the considerable damage that it causes to the areas anterior and posterior to the treatment strip; 3) the high level of contamination of water sources that it causes; 4) problems from drift when applying products with systemic action; and 5) the greater dangers of negative effects on humans and wild flora and fauna” (Defensoría, 2002). However, once again the Colombian government ignored these observations.

3.3 The surfactants used increase aerial drift and imprecision
The surfactants (POEA + Cosmo Flux 411) cause a decrease in glyphosate droplet size, causing it to remain in the air longer and increasing aerial drift, even when the air is still. In 1995, Minister of Environment Juan Mayr, when he was director of the Sierra Nevada Foundation of Santa Marta, said that “fumigation is imprecise if done aerially; there is always the risk that the wind will carry the chemical somewhere else and in this way it will end up affecting some other forested or crop zone, including flora and fauna.”

<table>
<thead>
<tr>
<th>Table 1: Aerial Fumigation of Illicit Crops with Glyphosate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical Aspects</strong></td>
</tr>
<tr>
<td>Airplane load</td>
</tr>
<tr>
<td>Actual discharge of Roundup Ultra, with 43.9% glyphosate</td>
</tr>
<tr>
<td>Spray width</td>
</tr>
<tr>
<td>Mixture deposited</td>
</tr>
<tr>
<td>Minimum flight altitude</td>
</tr>
</tbody>
</table>


Colombia’s National Narcotics Bureau (DINE) uses a mathematical formula in affirming that aerial drift from fumigation is never greater than 12 metres from the target spot. This official position was shattered during a test before the press when United States Senator Paul Wellstone, an opponent of spraying, received a “glyphosate bath” when he was invited to view a demonstration of the “technical precision” of aerial fumigation operations. The light wind blew the herbicide to the site where all the guests were, 200 metres away, demonstrating that precision in fumigation cannot be relied upon.

3.4 Violations of established standards
- A statement by a delegation of international organizations to Colombia (Stanton, 2002) mentions the following problems:
  - Not a single one of the fumigation conditions that the U.S. Congress has placed on Colombia is close to being met by the U.S. Administration and the Colombian government.

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19 [http://www.ciponline.org/colombia/02041004.htm](http://www.ciponline.org/colombia/02041004.htm)
The U.S. and Colombian governments have provided incomplete and conflicting information about the herbicides used.

The concentrations of herbicide far exceed the manufacturer’s instructions for its use in the United States. A concentration of 44% was used in Colombia, compared with 1-7% suggested in the U.S., with a maximum of 29%.

- The chemical should not come into contact with people, nor should it be applied directly to water according to the manufacturer. Nonetheless, aerial fumigation is done over food crops, water sources, houses, schools, domestic animals, cattle, forests and people.
- The Colombian government acknowledges that the aerial fumigation is done at altitudes between 15 and 60 metres, when the Syngenta company recommends that aerial fumigation using its products should not be done above 4 metres over the target in order to prevent drift.

4. The Impact in Ecuador: Studies done in the border region

Each fumigation episode along the border has caused numerous effects. The organizations belonging to the Interinstitutional Committee against Fumigations (CIF in Spanish) have been monitoring each of these episodes. Following is a summary of their findings:

2001: Acción Ecológica\(^\text{21}\) did a study of 142 Ecuadorians who were affected by fumigation, dividing them into three groups based on their distance from the Colombian border: 0-2 km, 5-6 km, and 8-10 km. The results found respiratory, intestinal, skin and eye problems. Effects were reported up to 10 km from the border inside Ecuador, affecting humans (including deaths), animals, and crops (70-90% crop loss).

**Figure 1: Most frequent symptoms found on the border during fumigations, by distance from the fumigated area in Colombia. Sucumbios, Ecuador. 2001**

\(^{20}\)Informe Conjunto sobre el Seminario-Taller “Erradicación de cultivos ilícitos” Bogotá, Colombia. 13 al 15 de febrero del 2002. p.11.

All symptoms were more frequent in people nearer the border, decreasing as the distance from the border increased. Three months later, there had been a five-fold decrease in illnesses in the zone, compared with the time fumigation took place.

**Figure 2: Symptoms found, according to distance from the source of fumigation, 3 months following fumigation: Sucumbios, Ecuador. 2001**

This study would later be used by the Government of Ecuador as the basis of its decision to request that Colombia not fumigate with crop-dusters closer than 10 km from the Colombia-Ecuador border inside Colombia, but instead destroy illicit crops manually.

**2001: A visit by social activist organizations** to Esmeraldas and Sucumbios found that a large number of people in the community of Mataje, Esmeraldas were sick from the polluted waters of the Mira River and the results of the Sucumbios study were confirmed. During the trip, it was found that seven children and one elderly man have died as a direct result of insecticides.

**Figures 3 and 4:**

22 CONAIE, FENOCIN, CONFUEUNASSC, 2001. Informe técnico de la comisión internacional sobre los impactos en territorio ecuatoriano de las fumigaciones aéreas en Colombia y recomendaciones de las organizaciones indígenas, campesinas y sociales.
2002: A new study by CIF in Sucumbios found considerable health impacts and the death of four more individuals, together with generalized crop destruction. In addition, a business owner who had developed a large fish-farming complex on the border reported that thousands of fish and hundreds of ducks had died in Puerto Mestanza and 95% of the population had left the town. During this visit, four of the people most affected by the fumigation tested positive for genetic damage, leading to the decision to do a broader study.

2003: The study on genetic damage, done for the Ecuadorean National Ombudsman’s Office, found that all the women studied who were impacted by fumigation and who experienced symptoms of intoxication showed DNA lesions in 36% of their cells on average, increasing the risk of cancer, birth defects and spontaneous abortion.

2003: Dr. Miguel López, physician and Ecuadorean congress member, on the congressional Commission on Health, Environment and Ecological Protection, visited the border and certified the impact of fumigation.

2004: In April, Dr. Arturo Campaña of the Centre for Health Studies Advisory Services (CEAS) participated in an International Verification Mission in Colombia to verify the impact of fumigation in the departments of Putumayo and Nariño. His report documents the use of chemicals at extremely high concentrations, great numbers of displaced people, psychological impact particularly affecting children, an increase in illness following fumigation, the death of children, effects on food crops, and fumigation as an attack on the local culture.

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2006: A study\textsuperscript{26} of 1,736 Ecuadorean schoolchildren discovered that those on the border have higher rates of malnutrition than those living farther from it.

Figure 7 (A-D):

A tour of the border in Esmeraldas revealed the severe conditions for the indigenous peoples who live on the border, such as the Awá, who have been repeatedly fumigated.

2006: Given the peculiar manner the school children demonstrated while the malnutrition study was being conducted, it was decided to do a pilot study in three schools using psychological testing.

\textsuperscript{26} Maldonado, et al., 2006. Estado de la nutrición en escuelas ecuatorianas de la frontera norte, afectadas por las aspersiones aéreas del Plan Colombia. Ed. Acción Ecológica, IEETM, CIF.
In the study, enormous differences were detected between drawings done in 2001, when fumigation began (above), and those done in 2006 (below). The study spelled out the problems found (see Table 2) and the authors summarized by stating that “these are the lowest levels of happiness we have ever found in children.” Viewing health as the presence of ‘alegremia,’ the border was filled with sadness, illness and death.

Table 2:

<table>
<thead>
<tr>
<th>ESCUELAS</th>
<th>RASGOS PSICOLÓGICOS</th>
<th>LEONIDAS PLAZA</th>
<th>CINCO DE AGOSTO</th>
<th>MANUELITA SAENZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problema de Aprendizaje</td>
<td>38%</td>
<td>70%</td>
<td>38%</td>
<td></td>
</tr>
<tr>
<td>Síndrome Afectivo</td>
<td>9%</td>
<td>31%</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Síndrome Desadaptativo</td>
<td>17%</td>
<td>8%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Sentimiento de Cupabilidad</td>
<td>39%</td>
<td>40%</td>
<td>24%</td>
<td></td>
</tr>
<tr>
<td>Auto desvalorización</td>
<td>37%</td>
<td>37%</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>Nivel de Autoestima</td>
<td>30%</td>
<td>24%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Preocupación Muerte –Salud</td>
<td>32%</td>
<td>39%</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>Ausencia de Si mismo</td>
<td>32%</td>
<td>41%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>Rasgos de Ansiedad</td>
<td>36%</td>
<td>31%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Depresión</td>
<td>31%</td>
<td>28%</td>
<td>41%</td>
<td></td>
</tr>
<tr>
<td>Ansiedad</td>
<td>33%</td>
<td>29%</td>
<td>38%</td>
<td></td>
</tr>
</tbody>
</table>

5. Ecuador’s Legal Arguments

Ecuador has appealed to the following rights and principles:


b) The right to a healthy environment, embodied in: The Constitution of Ecuador; comparative law; and international instruments [International Covenant on Economic, Social and Cultural Rights; Stockholm Declaration on the Human Environment; Rio Declaration on Environment and Development; Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological ( Biological) and Toxin Weapons and on Their Destruction; Protocol Additional to the Geneva Conventions of 12 August 1949; United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988); American Convention on Human Rights; International Covenant on Civil and Political Rights; World Summit on Sustainable Development]; and the right to prevention of cross-border contamination: Stockholm Declaration; Rio Declaration; Convention on Biological Diversity (Art.3).

c) The right to health.

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28 Alegremia: “The bubbling, fizzing joy in our blood;” term coined by Julio Monsalvo from Argentina.
d) Indigenous peoples’ right to health and to the environment.

But the governments of Colombia and the United States have turned a deaf ear. They make up cock-and-bull stories about the safety of glyphosate and play dumb when held accountable. But, outside of press conferences they acknowledge that “we know that fumigation causes illness, even death, ... but for us it is an acceptable cost.”

Conclusion

Today, there is no doubt in anyone’s mind that the crop eradication policy is a failed policy. Since 2001, over US$4 billion has been spent, and despite this, in 2006, the United Nations International Drug Control Programme (UNDCP) recognized that the coca crop has grown by 26% and that the number of Colombian departments where coca is currently being grown went from 11 to 23.

Figure 8: Displaced persons in Colombia from 1995 to 2003

When they say that dead children are an acceptable cost, they mean:

– The million Colombians who have been displaced since Plan Colombia began, abandoning hundreds of thousands of hectares to be taken over by agroindustry.
– The 357 points of interest that the U.S. embassy admits having in Colombia.
– The US$200 billion that the U.S. Department of Justice admits are laundered every year in the U.S. banking system and that is not prosecuted because of the tremendous support that some outlawed drugs mean to the U.S. economy.
– The fact that the New York Stock Exchange would crash if cocaine were legalized, as argued by U.S. researcher Catherine Fitts.

Plan Colombia fumigation is undeclared chemical warfare against the civilian population, trampling on international humanitarian law.

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29 Statement made by Roger Pardo-Maurer, Deputy Assistant Secretary of Defense for Western Hemisphere Affairs, to Luis Saavedra. 2003. INREDH, Relato de la comisión de organizaciones en visita a EEUU, octubre de 2003.