

**HUMANITARIAN &  
DEVELOPMENT  
PROGRAMME**

# **AN AGENT NAMED ORANGE**

## **A means to an endless destruction**

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**« GLOBAL HEALTH » THINK TANK**



At a time where we talk of *Glyphosphate* and its effects on our health, its presence on our plates and in our bodies as well as the European Union backpedalling over the ban of *Roundup* on European soil, its interesting to note yet another one of Monsanto's achievements.

With the name of a secret agent, it has only served one purpose: to destroy all trace of plant and animal life. Today, survivors of Agent Orange themselves tell us of the effects of this chemical, introduced at the time as a 'friend of nature'.

### AGENT ORANGE?

And thus the US military, who were never short of words of wit, dubbed the defoliant herbicide used in Vietnam between 1961 and 1971.

Agent Orange is a mix of several herbicides, with two main types used in equal measure: 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 2,4-dichlorophenoxyacetic acid (2,4-D) (but no need to remember these names worthy of being given to dinosaurs straight out of the Cenozoic!). The most important thing to know is that Agent Orange contains dioxin, a compound that is highly toxic to humans and is the main cause of its adverse health effects. Dioxin refers to a class of toxic chemicals that share the same structure – a benzene ring with two oxygen atoms. There are more than

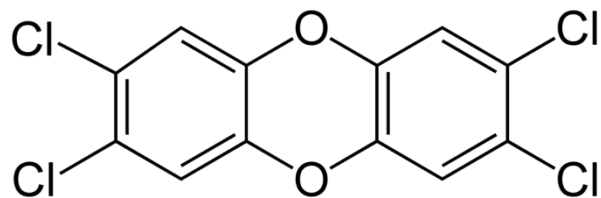


Figure 1 : Example of a dioxin congener: 2,3,7,8-tetrachlorodibenzo-p-dioxin (2006) Out of Copyright



Figure 2 : Viktor Yushchenko - Acne due to dioxin poisoning (2004) Out of copyright

200 types, of which only 17 are considered highly toxic. Dioxin is the toxin, for example, that was found in Viktor Yushchenko, former Ukrainian president, who survived a substantial and sudden exposure to dioxin but was nevertheless disfigured by a fulminant breakout of acne that left its mark on 2004.

Agent Orange is thus a 'cocktail' of toxins serving mainly as a defoliant, or a chemical capable of eliminating trees, their leaves and shrubs but also foliage, plants and crops for agricultural

purposes. The plants and trees die because the orange agent saturates them with growth regulators, meaning they grow at exceptional rates and therefore causes them to dry out. This effect can also be seen at the root, when the product is used heavily and penetrates the soil.

## THE HISTORY OF AGENT ORANGE

At the end of World War II, the American firm Monsanto established itself as one of the world leaders in industrial and domestic chemicals. It produced both DDT for mosquito control in the United States but also soil and sanitary products for US households. In the early sixties, Monsanto even started producing pharmaceuticals; they were able to synthesise Vitamin C as well as L-Dopa to treat Parkinson's disease, for which they won a Nobel Prize for Chemistry forty years later.

Around the same time, the British army were involved in a never-ending war in Malaysia and began to starve the population by spraying herbicides on Malaysian food crops. Inspired by this idea, US Secretary of State Dean Rusk advised President Kennedy to use herbicides in order to dislodge Viet Cong rebels on a 1km long strip along the banks of the Mekong River. A call for bids was then launched by the US government and two major firms responded: Dow Chemical Company and Monsanto. And thus became Operation Ranch Hand led by Admiral Elmo Zumwalt. Between October 1962 and January 1971, the US military sprayed about 45 million litres of Agent Orange over much of South Vietnam. Sprayed by squads of about 3 to 5 Fairchild C-123 aircraft dubbed 'Hades', Agent Orange was used both in order to deforest and destroy farmland.

The extent of the toxicity associated with exposure to Agent Orange was not well understood and documented over the years of intensive spraying. As a result, millions of Vietnamese as well as American soldiers were exposed to Agent Orange and suffered from serious consequences to their health. In addition to this, the US military had also tested the herbicide on the neighbouring Cambodia and Laos, but on areas much less populated than Vietnam. The spraying of the substance proved to be a major health disaster.



Figure 3 : Amiral Elmo Zumwalt Jr - Out of copyright

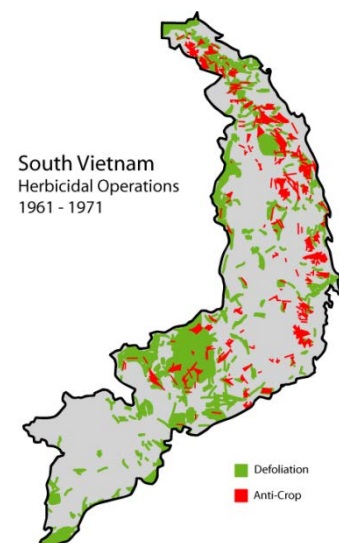


Figure 4 : Opération Ranch Hand au Vietnam (1962-1971) - Libre de droits

An interesting fact about Agent Orange's history is the origin of its name. It is, in fact, not orange but is somewhat translucent and not very viscous. Its name comes from the orange stickers on the 200 barrels, which were used to describe their contents.

As for Admiral Zumwalt, we are told that his own son, Elmo Zumwalt III, died from lymphoma, which was contracted after being exposed to Agent Orange whilst a lieutenant in Vietnam under his father's orders. And *his* son, who was born well after the end of the war in 1977, is now suffering from severe developmental delays, which may be due his father's exposure to dioxin.

## WHAT IS THE IMPACT ON THE POPULATION AND THE 'FLORA AND FAUNA' ?

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In 2010, a study conducted by Thomas George Boivin<sup>1</sup> showed that even after 40 years that dioxin was sprayed, its concentration was still very high in the sedimentary layer of river beds and in the tissue of several species of fish in Da Nang, Bien Hoa and Phu Cat. The concentration in areas that were bombarded with Agent Orange are up to 365 times higher than international and Vietnamese averages. What is even more worrying is that the unaffected areas downstream from areas sprayed in the 1970s also have high levels of dioxin, and consecutive samples taken from several studies in these areas show a steady increase in dioxin levels, indicating a continuous rise in toxic residues.

As for the wildlife at local level, the fish studied showed very high concentrations of dioxin in their muscle and fatty tissue. The recommendations of the study were to stop all fish farming as well as all aquatic animals (ducks, molluscs) and to avoid eating any local crops - pregnant women in particular.

After staying quiet over the issue, the WHO published a report in 2010<sup>2</sup> on the use of dioxin and its health risks. The report concluded that short-term exposure to high levels of dioxins can lead to skin lesions and impaired liver function. Long-term exposure is associated with impairment of the immune, nervous, endocrine and reproductive systems. However, the WHO then mitigated this by adding that humans have background concentrations of dioxins in the body due to its presence in nature, thus making it difficult to make well-founded accusations over dioxin.

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<sup>1</sup> Boivin, Thomas & Mh, Nguyen & Lk, Son & Gs, Bruce & Pj, Mcnamee & Vc, Thang & Nx, Truong & Tk, Sau & Dj, Moats & Hv, Ranamukhaarachchi. (2017). AGENT ORANGE DIOXIN CONTAMINATION IN THE ENVIRONMENT AND FOOD CHAIN AT KEY HOTSPOTS IN VIET NAM: DA NANG, BIEN HOA and PHU CAT

<sup>2</sup>Dobson, Stuart, (2010). World Health Organization - Exposure to dioxins and dioxin-like substances: A major public health concern.

The National Association of American Veterans has supported several studies that have identified a list of likely diseases linked to a confirmed exposure to dioxins in Agent Orange. This relates only to the first generation i.e. American veterans but also the villagers who were directly sprayed with the orange agent, thus causing rapid onset diseases such as chloric acne or amyloidosis, some cancers such as chronic leukaemia, multiple myeloma, non-Hodgkin's lymphoma, prostate cancer, lung or soft tissue tumours. And finally, metabolic disorders such as type II diabetes, coronary heart disease, Parkinson's disease and some peripheral neuropathies and porphyria.

As for the second generation, specifically the children of veterans, but also the children of Vietnamese victims who had themselves been exposed in the areas they lived, the illnesses are varied. There are many studies that have recorded various defects discovered at birth: limb, renal and corpus callosum agenesis. Neural tube defects ranging from spina bifida to anencephaly have also been observed, but to date, no study has been able to prove an undisputable link between dioxin exposure and the presence of these defects. In laboratory animals, however, a strong correlation has been seen between even a brief exposure to dioxin and the rate of neural tube defects.

With regards to the number of victims, the American congress recognises that today, nearly 365,000 Vietnamese people present with disorders relating to exposure to Agent Orange. We're talking about 3 generations of Vietnamese people. According to VAVA (Vietnam Association of Victims of Agent Orange), nearly 4.8 million people were exposed to dioxin in Vietnam between 1963 and 2015.

## THE LEGAL CONSEQUENCES FOR THOSE RESPONSIBLE

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Vietnam didn't begin to discuss Agent Orange openly and officially until 1997. At the first bilateral meetings between Vietnam and the United States, US Secretary of the Treasury Robert Rubin said he hoped the two countries could work together to solve the problems surrounding Agent Orange. In 1984, the Vietnam War Veterans Association filed a lawsuit against Monsanto and 36 other companies that served in Vietnam and were involved in the production of Agent Orange. Judge Jack Weinstein proposed an amicable settlement and the companies in question paid the equivalent of \$180 million to 291,000 people including former military personnel, their families and US army personnel affected by dioxin. The companies agreed to pay so long as they were clear any suspicions of guilt. It was in 2004 that the Vietnamese Association of Victims of Agent Orange filed a lawsuit against the same US court against Monsanto; the case was

dismissed by the court following the verdict of the previous trial. This is the only legal action against Monsanto by Vietnamese victims to date.

Monsanto continues to deny any claims to Agent Orange, claiming that the company was itself a victim of the collateral effects of the product and its use in unintended circumstances. Carla Lord, a spokeswoman for Monsanto, even cited a company with the same name that had indeed at the time provided the US Army with Agent Orange, that were completely independent from Monsanto today.

The US government has denied any responsibility for the deaths caused by the use of Agent Orange. It recognises, however, that certain illnesses could have been 'discovered or worsened' by the use of certain chemicals, such as Agent Orange, within the army.

Many awareness campaigns for Vietnamese farmers are being undertaken by the Vietnam Association of Victims of Agent Orange/Dioxin (VAVA) to boycott Monsanto products. This did not, however, stop the American firm from becoming the main seed supplier in southern Vietnam.

Meanwhile, the US military, having allied with its veterans by turning against Monsanto, has also been cleared of all charges and remains inculpable in the US court over Operation Ranch Hand.

The US government has designated August 10<sup>th</sup> as 'Agent Orange Day', an official commemoration for the 'victims' of Agent Orange/dioxin – a poor consolation. August 10<sup>th</sup> 1961 marks the first use of the Agent Orange defoliant on Vietnamese forests. And in 2008, the Vietnamese Red Cross planned a 'Month of Awareness' to support the victims of Agent Orange /dioxin, from the 10<sup>th</sup> August to the 9<sup>th</sup> September. ■

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*A Think Tank under the*

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