

AGENT ORANGE

“When we initiated the herbicide program in the 1960’s we were aware of the potential damage due to dioxin contamination in the herbicide, however because the material was to be used on the enemy, none of us were overly concerned.” – Dr. James Clary, military scientist in a letter to congress.¹²⁰

Agent Orange Overview & the 1984 Settlement

During the Vietnam War, Dow was one of the major manufacturers of “Agent Orange”,^{xix} a chemical defoliant which was used as an anti-guerrilla war tactic to deny North Vietnamese forces cover in the jungle. In addition to Dow, other manufacturers included Monsanto Company, Hercules Inc., Diamond Shamrock Chemicals Company, Uniroyal Inc., Thompson Chemical and T-H Agriculture and Nutrition Company. Dow and Monsanto were the largest producers of Agent Orange (28.6% and 29.5% respectively) with the other companies manufacturing lesser fractions of the chemical.

Agent Orange was extremely toxic and contaminated to varying degrees with dioxins, which even at that time were known both inside and outside Dow to have severely toxic properties. As a result of health impacts arising from Agent Orange exposure, the Veterans Administration maintains a medical registry to track the health of veterans who’ve been exposed.

The US Government now recognizes the following conditions are related to exposure to Agent Orange: Type II diabetes, spina bifida, various cancers,¹²¹ Hodgkins disease, acute and sub-acute neuropathy, a large number of soft tissue sarcomas and multiple myeloma.¹²² (See appendix D. for a full list)

The health effects of Agent Orange on U.S. soldiers led to extensive court battles over responsibility for the damage caused by exposure. Dow and its fellow defendants maintain that as government contractors, they are shielded from prosecution. In addition, they maintain that the government knew about the dioxin contamination and ordered them to continue production for the war effort in Vietnam. Judge Weinstein, who oversaw the case in the early eighties, determined that long term litigation was not in the best interest of the litigants and brokered an out of court settlement fund of \$180 million for the veterans in 1984.¹²³ Observers at the time indicate that the defendants might have settled for as much as \$400 million.¹²⁴

According to the Dept. of Veterans Affairs, 52,000 veterans received payouts from the fund which disbursed the last monies in 1994, after which it was closed for lack of funds. The issue, however, appears to be expanding rather than receding. Recent studies¹²⁵ of U.S. veterans have confirmed the connection between Type II diabetes and exposure to Agent Orange, in particular the dioxin component of the herbicide, as well as a plethora of other

^{xix} A number of herbicides were used in the war, known as the “rainbow herbicides” due to the colored stripes denoting the chemicals on the storage barrels, Agent Orange being the most prominent among them.

diseases that emerge long after exposure occurs. The Supreme Court recently ruled in favor¹²⁶ of a new group of veterans who say their Agent-Orange exposure related illnesses occurred after the 1984 settlement funds were closed to new applicants in 1994, and thus reopened the possibility of another payout to veterans. The case has currently been remanded back to lower courts for a final determination.

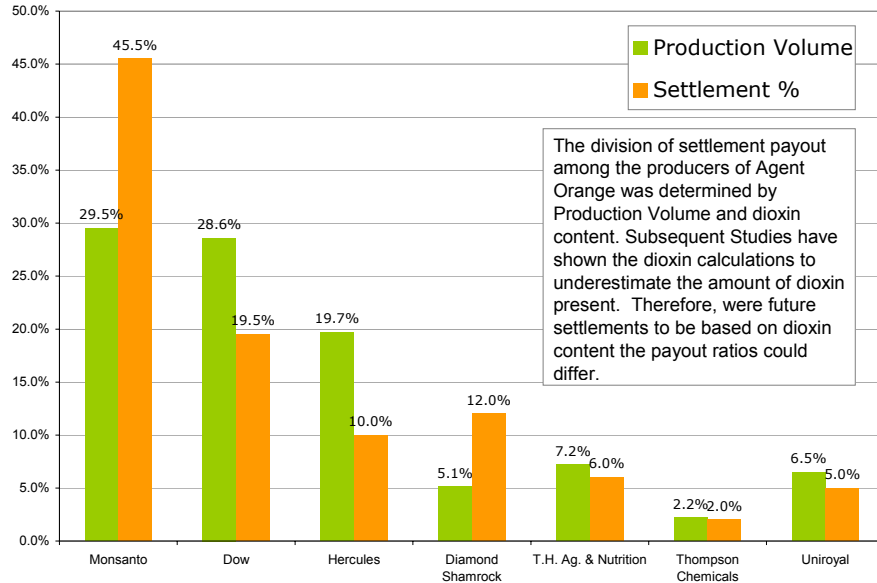


Figure 17. 1984 Agent Orange Settlement Allocation
(Source: Schuck P. 1986¹²⁷)

In the 1984 settlement roughly 50% of the applicants received compensation. It should be noted that the scope of health problems linked to Agent Orange exposure through scientific studies has widened significantly and includes damage to the health of children of veterans born after exposure.¹²⁸ The implication is that a greater proportion of claims could be honored as a result of better scientific understanding of the links between Agent Orange exposure and disease/birth defects.

United States Veterans and Agent Orange – Claims to US Government

Number of vets who took exams under the Agent Orange Registry prior to 1984	70,600 ¹²⁹
Total number of claims received by 1994 under Payment Program set up in the out of court settlement.	105,000
Number of vets receiving VA disability compensation for Agent Orange-related causes.	52,000
Number of vets who've taken exams under the Agent Orange registry since March 2000.	297,194
Number of claims filed alleging Agent Orange exposure-related health effects as of 2003.	99,266

Figure 18. U.S. Veterans Affected by Agent Orange Exposure

Agent Orange Concerns Beyond U.S. Vietnam Veterans

Agent Orange exposure has also become an issue for military personnel stationed outside of combat zones and for U.S. civilians as well. Soldiers stationed on Guam who handled Agent Orange have become ill and



symptoms of TCDD (dioxin) poisoning are apparent in the general population of the island as well.¹³⁰ TCDD contamination as a result of Agent Orange handling has been measured at up to 1900 ppm in some areas of Andersen Air Force Base on Guam.¹³¹ Given that safe levels of TCDD have been placed at below 1 ppb by the EPA and even lower by many state regulatory agencies (toxic effects have been measured at parts per trillion), this implies an extraordinary level of contamination. TCDD has been shown in laboratory animals to have multigenerational impacts, not just on the offspring of exposed animals, but on the next generation as well.

Figure 19. Agent Orange Spraying in Vietnam
(Source: BBC)

In addition to new studies detailing health impacts, there is ongoing research to more accurately calculate levels of TCDD contamination of Agent Orange, and thus, exposure as a result of the use of Agent Orange. According to recent studies by Columbia University's Mailman School of Public Health^{132,133} the amounts of TCDD contaminant in Agent Orange were up to four times greater than previously estimated. The equivalent of 600 kg of pure TCDD was sprayed and spilled in Vietnam. Given that this is a compound for which yearly emissions by the chemical industry are measured in grams and exposure thresholds are calculated in picograms, this represents an extraordinary amount of dioxin.

According to Dr. Arthur Galston, Professor Emeritus at the Yale School of Forestry & Environmental Studies, who spoke at the Yale University conference, *The Ecological and Health Effects of the Vietnam War*, "the use of Agent Orange as a defoliant and herbicide in Vietnam was the largest chemical warfare operation in history, producing considerable ecological as well as public health damage."¹³⁴ Further studies¹³⁵ show that dioxin levels remain high in many Vietnamese exposed to Agent Orange and even their children. U.S. bases, such as Bien Hoa for instance, still show dioxin contamination levels of 1.2 ppm¹³⁶ and food samples taken from the area in 2002¹³⁷ show dioxin levels approaching those found during the Vietnam War. As a result of exposure to TCDD contamination and Agent Orange, numer-

ous groups are seeking restitution from Dow and other Agent Orange manufacturers. According to various estimates,¹³⁸ from 500,000 to 1,000,000¹³⁹ Vietnamese are suffering from exposure to chemical defoliants used during the war and up to 500,000 have died as a result of such exposure, according to the Vancouver-based Hatfield Associates, an environmental research consultancy. On Jan. 30, 2004, a class action lawsuit was filed by the Vietnam Association for Victims of Agent Orange on behalf of three Vietnamese citizens listed as plaintiffs. The case was filed in Brooklyn, New York listing the manufacturers of Agent Orange as defendants. Nguyen Trong Nhan, the organization's vice president, said more than 20 American companies engaged in the production of Agent Orange were named in the suit, including Dow Chemical and Monsanto.¹⁴⁰ The amount of money the three plaintiffs are seeking in damages has not yet been disclosed.

Additionally, legal challenges and appeals have been brought by New Zealand and South Korean troops who served in Vietnam and were exposed to Agent Orange. Veterans organizations in South Korea estimate that the number of those exposed is in the tens of thousands.¹⁴¹ 300,000 South Koreans fought with U.S. forces in Vietnam between 1965 and 1973.

Given Dow's intimate connection with Agent Orange production, this implies a significant level of liability outside the U.S. in addition to the issue of U.S. veterans. Also the recent spate of activity around the issue, such as lawsuits, conferences, diplomatic pressure for assistance, and protests by foreign veterans, implies that the issue could have a detrimental effect on the company's reputation with unknown consequences for future profitability.

UNION CARBIDE AND SEMICONDUCTOR LIABILITY

Union Carbide, as a supplier of chemicals to the semiconductor industry, has been named in lawsuits along with **IBM** and **National Semiconductor**, potentially signaling the advent of billions of dollars worth of claims against the entire semiconductor industry and its suppliers. Cases allege a connection between clean-room working conditions and chemicals and a variety of cancers, miscarriages and birth defects.

By end of 2003, more than 220 claims on behalf of former and deceased IBM employees who worked at IBM's East Fishkill, New York fabrication facility will enter into effect. A case involving 50 former employees of National Semiconductor (37 of them worked at the Greenock, Scotland facility) is underway in California.¹⁴²

The possibility that employees of other companies could file claims may be contingent upon initial settlement amounts, manufacturing history/profile, brand visibility, and corporate culture. For point of reference, IBM settled one claim with two former employees who claimed that toxic fumes they breathed in the Fishkill facility were to blame for their son's birth defects. The amount of the settlement was not disclosed but the initial amount sought was \$40 million. Legal experts have suggested that this settlement will serve as a bellwether, and that all other cases would likely be settled out of court.