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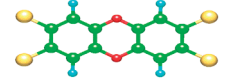
# Facts about Agent Orange and Dioxin

**21 million gallons of defoliants and herbicides were sprayed by plane, helicopter and hand over southern Viet Nam from 1961 - 1971 during the Vietnam War. Laos and Cambodia were also sprayed to lesser extents. Two-thirds of the defoliants and herbicides were contaminated with TCDD or dioxin.**



The defoliants came in 55 gallon drums and were named for the color band around the barrel to distinguish the different defoliants. The barrels were often re-used by the military and civilians for showers, BBQs and water storage - further contaminating the users with the traces of dioxin that remained in the barrels.

Agent Orange, was the most commonly used defoliant. It was made up of an equal mixture of the herbicides 2, 4-D and 2,4,5-T.



During the manufacturing process 2,4,5-T was contaminated by 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD). Agents Purple, Pink and Green which were used between 1962-64 before the introduction of Agent Orange also contained TCDD. TCDD has been classified by the EPA as a known human carcinogen.

TCDD

## AREAS SPRAYED BY HERBICIDES

*Laos, especially along the border of Vietnam was also sprayed. Little is known about the extent of the spraying. It is also not known whether any spraying was done in other parts of Laos during the secret war conducted by the CIA.*

*Parts of Cambodia were also sprayed*



The herbicides were provided to the US military by Dow, Monsanto, Diamond Shamrock, Occidental, Hercules and other American chemical companies. The companies were aware that dioxin was a by-product of the manufacturing process and could have reduced the level of TCDD to minimal levels (about 1 ppt). However they did not follow standard manufacturing guidelines and as result dioxin levels in the batches of 2,4,5-T averaged 13 ppt according to research by Jeanne Stellman of Columbia University. Stellman's research also determined that an estimated 366 kilograms of dioxin was sprayed over Viet Nam during the war.



US Veterans who served in Viet Nam during the war are presumed by the Veteran's Administration to have been exposed to dioxin. They are eligible for compensation from the VA if they have one of the diseases associated with service in Viet Nam. (photo Pfeiffer)

Jeanne Stellman's research also found that as many as 4.8 million Vietnamese civilians were living in the areas sprayed by airplane. This figure does not include the Vietnamese soldiers (on both sides of the war), Vietnamese civilians who traveled through the sprayed regions, or those that worked on the military bases which were frequently sprayed. The Viet Nam Red Cross believes that up to three million Vietnamese suffer from illness or disabilities caused by exposure to Agent Orange, among this number are about 150,000 Vietnamese children disabled from their parent's exposure to dioxin. Women living in sprayed regions have experienced high rates of premature birth, spontaneous abortions, stillbirths, molar pregnancy, uterine cancer, and severe birth defects.

**Diseases and birth defects in Viet Nam officially recognized by the US government as related to dioxin exposure: None**

**Diseases recognized by the Veteran's Administration as related to service in Viet Nam:** Prostate cancer, Peripheral neuropathy (acute and sub-acute) , Diabetes Type II , Chlor-acne [one year after exposure] , Non-Hodgkin's Lymphoma, Porphyria cutanea tarda [one year after exposure], Respiratory cancers, including cancer of the lung, bronchus, larynx, trachea, Multiple myeloma, Hodgkin's disease, Soft Tissue Sarcomas and Chronic lymphocytic leukemia.

**Birth Defects in children of male and female Veterans recognized by the VA:** Spina Bifida

**Birth defects in children of female Veterans recognized by the VA as related to service in Viet Nam:** Achondroplasia, Cleft lip and cleft palate, Congenital heart disease, Congenital talipes equinovarus (clubfoot), Esophageal and intestinal atresia, Hallerman-Streiff syndrome, Hip dysplasia, Hirschsprung Disease, Hydrocephalus due to aqueductal stenosis, Hypospadias, Imperforate anus, Neural tube defects (including spina bifida, encephalocele, and anencephaly), Poland syndrome, Pyloric stenosis, Syndactyly (fused digits), Tracheoesophageal fistula, Undescended testicle, Williams syndrome



According to Vietnamese ecologists 24% of southern Viet Nam was sprayed, an area equivalent to the size of New Jersey. As a result 5 million acres of mangrove and upland forest were defoliated and 500,000 acres of crops were destroyed. Viet Nam's ecosystem was permanently changed in many areas impacting biodiversity, destroying habitats, damaging river basins and disrupting the livelihoods and culture of communities dependent on the forests. (Photo by Goro Nakamura 1976)

An estimated 2 million acres in southern Viet Nam are still barren and unproductive today. It would take 80 - 100 years of intensive replanting to bring the upland forests back to their original state. The defoliated land is also prone to severe erosion.



Hot spots: A limited number of areas with high residual dioxin exist today. The Vietnamese have listed the former airbases at Da Nang, Bien Hoa and Phu Cat as priority hotspots in need of containment or clean-up. (Photo Hatfield Group 2002)

**What is being done to address the impacts of Agent Orange/Dioxin in Viet Nam**

In 2004, the Viet Nam Association of Victims of Agent Orange (VAVA) in Viet Nam sued the US companies that manufactured the herbicides. The case was dismissed in 2005 and all efforts to reinstate the case failed, including a petition to the US Supreme Court to hear the case. However, the lawsuit resulted in the development of a grassroots movement in Viet Nam to support those affected by Agent Orange.

The Viet Nam Red Cross, VAVA, Buddhist and Catholic churches, U.S. veterans groups, Ford Foundation, the War Legacies Project, East Meets West, Children of Viet Nam, UNICEF and other not-for-profit organizations have projects to support individuals, families, and communities in Viet Nam impacted by Agent Orange. However, these projects are not sufficient to meet the needs of the hundreds of thousands of Vietnamese impacted by Agent Orange/Dioxin. More funding is needed to provide adequate medical care, rehabilitation services and adaptive equipment, respite care, special education, vocational training and income generation.

More than thirty years after the end of the war, the US government has recently begun to work with the Vietnamese to address the legacy of Agent Orange in Viet Nam. A Joint Advisory group made up of representatives of US and Vietnamese government agencies has held annual meetings since 2006. The US has funded a \$2 million five-year joint Viet Nam - US EPA project to build capacity for analysis of dioxin and other related chemicals as well as to evaluate the contamination at the Da Nang Airbase. In a significant first step Congress allocated \$3 million in 2007 to address remediation of dioxin hotspots in Viet Nam and to support public health programs in the surrounding communities. An additional \$3 million was allocated in 2009. The US does not acknowledge that Agent Orange has caused disabilities in Viet Nam therefore the US government position is to assist the disabled regardless of cause. Since 1989 the US has provided \$47 million for programs to assist the disabled in Viet Nam, much of this through the Leahy War Victims Fund targeted at those who have been disabled by unexploded ordinance. Very little of this funding has reached those with severe and multiple disabilities believed to be caused by Agent Orange.

For more information visit the War Legacies Project's Website: <http://www.warlegacies.org>.

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