Agent Orange

And the

Vietnam Veteran

THE HISTORY OF AGENT ORANGE USE IN VIETNAM

Background

Agent Orange is the code name for one of the herbicides and defoliants used by the U.S. military as part of its herbicidal warfare program, Operation Ranch Hand, during the Vietnam War from 1961 to 1971. Vietnam estimates 400,000 people being killed or maimed, and 500,000 children born with birth defects.

A 50:50 mixture of 2,4,5-T and 2,4-D, it was manufactured for the U.S. Department of Defense primarily by Monsanto Corporation and Dow Chemical. The 2, 4, 5-T used to produce Agent Orange was later discovered to be contaminated with 2, 3, 7, 8-tetrachlorodibenzodioxin, an extremely toxic dioxin compound. It was given its name from the color of the orange-striped 55 US gallon (200 L) barrels in which it was shipped, and was by far the most widely used of the so-called "Rainbow Herbicides". During the Vietnam War, between 1962 and 1971, the United States military sprayed nearly 20,000,000 US gallons (75,700,000 L) of chemical herbicides and defoliants in Vietnam, eastern Laos and parts of Cambodia, as part of Operation Ranch Hand. The program's goal was to defoliate forested and rural land, depriving guerrillas of cover; another goal was to induce forced draft urbanization, destroying the ability of peasants to support themselves in the countryside, and forcing them to flee to the U.S. dominated cities, thus depriving the guerrillas of their rural support base and food supply.

The US began to target food crops in October 1962, primarily using Agent Blue. In 1965, 42 percent of all herbicide spraying was dedicated to food crops. Rural-to-urban migration rates dramatically increased in South Vietnam, as peasants escaped the destruction and famine in the countryside by fleeing to the U.S.-dominated cities. The urban population in South Vietnam nearly tripled: from 2.8 million people in 1958, to 8 million by 1971. The rapid flow of people led to a fast-paced and uncontrolled urbanization; an estimated 1.5 million people were living in Saigon slums, while many South Vietnamese elites and U.S. personnel lived in luxury.

United States Air Force records show that at least 6,542 spraying missions took place over the course of Operation Ranch Hand. By 1971, 12 percent of the total area of South Vietnam had been sprayed with defoliating chemicals, at an average concentration of 13 times the recommended USDA application rate for domestic use. In South Vietnam alone, an estimated 10 million hectares of agricultural land were ultimately destroyed. In some areas TCDD concentrations in soil and water were hundreds of times greater than the levels considered "safe" by the U.S. Environmental Protection Agency.[10] [11] Overall, more than 20% of South Vietnam's forests were sprayed at least once over a nine year period.

ARMY EXPERIMENTS WITH DEFOLIANTS

The Army continued to experiment with 2, 4-D during the 1950s and late in the decade found a potent combination of chemicals which quickly found its way into the Army's chemical arsenal. Army scientists found that by mixing 2, 4-D and 2, 4, 5-trichlorophenoxyacetic acid (2, 4, 5-T) and spraying it on plants, there would be an almost immediate negative effect on the foliage. What they didn't realize, or chose to ignore, was that 2, 4, 5-T contained dioxin, a useless by-product of herbicide production. It would be twenty more years until concern was raised about dioxin, a chemical the Environmental Protection Agency (EPA) would later call "one of the most perplexing and potentially dangerous" known to man. According to the Encyclopedia Britannica, "The toxicity of dioxin renders it capable of killing some species of newborn mammals and fish at levels of five parts per trillion (or one ounce in six million tons). Less than two millionths of an ounce will kill a mouse. Its toxic properties are enhanced by the fact that it can pass into the body through all major routes of entry, including the skin (by direct contact), the lungs (by inhaling dust, fumes or vapors), or through the mouth. Entry through any of these routes contributes to the total body burden. Dioxin is so toxic, according to the encyclopedia, because of this: "Contained in cell membranes are protein molecules, called receptors that normally function to move substances into the cell. Dioxin avidly binds to these receptors and, as a result, is rapidly transported into the cytoplasm and nucleus of the cell, where it causes changes in cellular procession." After minimal experimentation in 1961, a variety of chemical agents was shipped to Vietnam to aid in anti-guerilla efforts. The chemicals were to be used to destroy food sources and eliminate foliage that concealed enemy troop movements.

RAINBOW HERBICIDES

The various chemicals were labeled by color-coded stripes on the barrels, an arsenal of herbicides known by the colors of the rainbow, including Agent Blue (which contained arsenic), Agent White, Agent Purple, and the lethal combination of 2,4-D and 2,4,5-T, Agent Orange. On January 13, 1962, three U.S. Air Force C-123s left Tan Son Nhut airfield to begin Operation Hades (later called Operation Ranch Hand), the defoliation of portions of South Vietnam's heavily forested countryside in which Viet Cong guerrillas could easily hide. By September, 1962, the spraying program had intensified, despite an early lack of success, as U.S. officials targeted the Ca Mau Peninsula, a scene of heavy communist activity. Ranch Hand aircraft sprayed more than 9,000 acres of mangrove forests there, defoliating approximately 95 percent of the targeted area. That mission was deemed a success and full approval was given for continuation of Operation Ranch Hand as the U.S. stepped up its involvement in Vietnam.

PROJECT PINK ROSE

One of the U.S. government's worst planned and executed efforts to use herbicides was a secret operation known as "Project Pink Rose." According to a declassified report released in 1990, on "Project Pink Rose," the operation had its genesis in September 1965 when the Joint Chiefs of Staff received a recommendation from the Commander in Chief Pacific "to develop a capability to destroy by fire large areas of forest and jungle growth in Southeast Asia." On March 11, 1966, a test operation known as "Hot Tip" was documented at Chu Pong mountain near Pleiku when 15 B-52s dropped incendiaries on a defoliated area. According to the declassified memo, "results were inconclusive but sufficient fire did develop to indicate that this technique might be operationally functional." What neither the government nor the chemical companies told anyone was that burning dioxins significantly increases the toxicity of the dioxins. So, not only was the government introducing cancer causing chemicals into the war, it was increasing their toxicity by burning them. Nevertheless, "Project Pink Rose" continued. In November, 1966, three free strike target areas were selected: one in War Zone D and two in War Zone C. Each target was a box seven kilometers square. The target areas were double and triple canopy jungle. The areas were heavily prepped with defoliants, the government dumping 255,000 gallons on the test sites. The three sites were bombed individually, one on January 18, 1967, another January 28, 1967 and the last on April 4, 1967. According to the memo, "the order and dates of strikes were changed to properly phase Pink Rose operations with concurrent ground operations", which means that U.S. and Vietnamese troops were living and fighting in these test sites on which 255,000 gallons of cancer causing defoliants had been dumped. The results of "Project Pink Rose" were less than favorable. According to the memo, "The Pink Rose technique is ineffective as a means of removing the forest crown canopy." The conclusion "Further testing of the Pink Rose technique in South Vietnam under the existing concept is terminated".

The Drift Issue of Agent Orange

The issue of "mist drift" continued to plague the defoliation program. How far would it drift? How fast? Wind speed and direction were of major concerns in answering these questions. Yet, there were other questions, many of which could not be answered. What happened in humid weather?
How quickly did the chemicals diffuse in the atmosphere or were they carried into the clouds and dropped dozens of miles away? How long would the rainbow herbicides linger in the air or on the ground once they were sprayed? A November 8, 1967 memorandum from Eugene M. Locke, deputy U.S. ambassador in Saigon, once again addressed the problem of "mist drift" and "significant damage" to rubber plantations from spraying earlier in the year. According to Locke, "the herbicide damage resulted from a navigational error; some trees in another plantation had been defoliated deliberately in order to enhance the security of a U.S. military camp. The bulk of the herbicide damage must be attributed, however, to drift of the herbicide through the atmosphere. This drift occurs (a) after the spray is released from the aircraft and before it reaches the ground, and/or (b) when herbicide that has already reached the ground vaporizes during the heat of the day, is carried aloft, then moved by surface winds and eventually deposited elsewhere. "There is a lack of agreement within the Mission regarding the distances over which the two kinds of drift can occur. When properly released (as required at 150 feet above the target, with winds of no more than 10 mph blowing away from nearby plantations) herbicide spray should fall with reasonable accuracy upon its intended target. The range of drift of vaporized herbicide, however, has not been scientifically established at the present time. In recognition of this phenomenon and to minimize it, current procedures require that missions may be flown only during inversion conditions, i.e., when the temperature on the land and in the atmosphere produces downward currents of air. Estimates within the Mission of vaporized herbicide drift range from only negligible drift to distances of up to 10 kilometers and more." Ten kilometers and more. More than six miles. In essence, troops operating more than six miles from defoliation operations could find themselves, their water and their food doused with chemical agents, including dioxin-laced Agent Orange. More than four months later, on March 23, 1968, Gen. A.R. Brownfield, then Army Chief of Staff, sent a message to all senior U.S. advisors in the four Corps Tactical Zones (CTZ) of Vietnam. Brownfield ordered that "helicopter spray operations will not be conducted when ground temperatures are greater that 85 (degrees) Fahrenheit and wind speed in excess of 10 mph." But the concern was not for any troops operating in the areas of spraying, as was evident in the memo, but for the rubber plantations. The message ordered that "a buffer distance of at least two (2) kilometers from active rubber plantation must be maintained." No such considerations were given for the troops operating in the area.

Dioxin Overview

The toxicological profile of peony herbicides in laboratory animals shows that major pathological phenomena occur in the liver and the reproductive system. These chemicals are carcinogenic and teratogenicin in laboratory animals. The human epidemiological picture for phenoxy herbicides is not as well-defined as the toxicological one. Swedish investigators have found associations between various cancers and exposure to these herbicides. Cancer associations in other epidemiological studies have been inconsistent. The most consistent associations are seen with non-Hodgkin's lymphoma and soft tissue sarcomas 12. In July 1993 the NAS (National Academy of Sciences) released its report on the scientific evidence. "Six To Twenty-Five Times Stronger Than Recommended." Over the next nine years, an estimated 12 million gallons of Agent Orange were sprayed throughout Vietnam. The U.S. military command in Vietnam insisted publicly the defoliation program was militarily successful and had little adverse impact on the economy of the villagers who came into contact with it.

The Air Force knew of health Issues - Scientists involved in Operation Ranch Hand and documents uncovered in the late 1980's in the National Archives present a troubling picture. There are strong indications that military officials were aware as early as 1967 of the limited effectiveness of chemical defoliation and they knew of potential long-term health risks of frequent spraying.

Veterans Begin to Develop Health Problems - As soldiers who had served in Vietnam attempted to settle back into civilian life following their tours, some of them began to develop unusual health problems. There were skin and liver diseases and what seemed to be an abnormal number of cancers to soft tissue organs such as the lungs and stomach. There also seemed to be an unusually high number of birth defects
among children born to Vietnam veterans who had been exposed to Agent Orange. Some veterans experienced wild mood swings, while others developed a painful skin rash known as chloracne. Many of these veterans were found to have high levels of dioxin in their blood, but scientists and the U.S. government insisted there was no link between their illnesses and Agent Orange. In the mid 1970s, there was renewed interest in dioxin and its effects on human health following an industrial accident in Seveso, Italy, in which dioxin was released into the air, causing animal deaths and human sickness. One of the more bizarre aspects of a report from the CDC was the claim that those veterans who suffered most from non-Hodgkin's lymphoma had served on Navy ships off the coast o Vietnam. It said that those who had served in III Corps, which had some of the heaviest Agent Orange spraying of the war, seemed to be at lower risk.

Agent Orange: Birth Defects in Children of Women Vietnam Veterans

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Birth Defects that are covered by the VA that are Presumptive Conditions for Women of Vietnam

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Birth defects are abnormalities present at birth that result in mental or physical disabilities. VA recognizes a wide range of birth defects as associated with women Veterans' service in Vietnam. These diseases are not tied to herbicides, including Agent Orange, or dioxin exposure, but rather to the birth mother's service in Vietnam.

Covered birth defects include, but are not limited to, the following conditions:

- **Achondroplasia**
- **Cleft lip and cleft palate**
- **Congenital heart disease**
- **Congenital talipes equinovarus (clubfoot)**
- **Esophageal and intestinal atresia**
- **Hallerman-Streiff syndrome**
- **Hip dysplasia**
- **Hirschprung's disease (congenital megacolon)**
- **Hydrocephalus due to aqueductal stenosis**
- **Hypospadias**
- **Imperforate anus**
- **Neural tube defects**
- **Poland syndrome**
- **Pyloric stenosis**
- **Syndactyly (fused digits)**
- **Tracheoesophageal fistula**
- **Undescended testicle(s)**

VA's Current Agent Orange Presumptive List of Conditions (Updated 6 Oct 2011)

Presumptive Service Connection (herbicide-related Diseases) – If a Veteran has one of the diseases listed in the 38 CFR and his/her exposure to a herbicide is either presumed, based on service with in the boundaries of Vietnam, Thailand, Korea, or otherwise proven by the evidence, the disease is presumed to be related to the in-service exposure.

Type of Diseases

Coronary Artery Disease or CAD – covers a wide spectrum of symptoms and effects such as: Ischaemic or Ischemic heart disease (IHD), or myocardial ischaemia, is a disease characterized by ischaemia (reduced blood supply) to the heart muscle, usually due to coronary artery disease (atherosclerosis of the coronary arteries).

Acute and Subacute Peripheral Neuropathy – A nervous system condition that causes numbness, tingling, and motor weakness. Under the VA's rating regulations, it must be at least 10% disabling with 1 year of exposure to Agent Orange and resolve with 2 years after the date it began.

AL Amyloidosis – A rare disease caused when an abnormal protein, amyloid, enters tissues or organs.

B Cell Leukemias – Cancers which affect B cells, such hairy cell leukemia.

Chloracne (or similar acneform disease) – A skin condition that occurs soon after dioxin exposure and looks like common forms of acne seen in teenagers. Under the VA's rating regulations, chloracne (or other acneform disease similar to chloracne must be at least 10% disabling with 1 year of the exposure to Agent Orange.

Chronic Lymphocytic Leukemia – A disease that progresses slowly with increasing production of excessive number of white blood cells.

Diabetes Mellitus (Type 2) – A disease characterized by high blood sugar levels resulting from the body's inability to respond properly to the hormone insulin.

Hodgkin's disease – A malignant Lymphoma (Cancer) characterized by progressive enlargement of the Lymph nodes, Liver, and spleen, and by progressive anemia.

Ischemic Heart Disease – A disease Characterized by a reduced supply of blood to the heart.

Multiple Myeloma – A cancer of specific bone marrow cells that is characterized by bone marrow tumors in various bones of the body.

Non-Hodgkin's Lymphoma – A group of cancers that affect the lymph glands and other lymphatic tissues.

Parkinson's disease – A motor system condition with symptoms that include trembling of the limbs and face and impaired balance.

Porphyria Cutanea Tarda – A disorder characterized by liver dysfunction and by thinning and blistering of the skin in sun-exposed areas. Under the VA's rating regulations, it must be a least 10% disabling within 1 year of exposure to Agent Orange.

Prostate Cancer – A Cancer of the Prostate gland, one of the most common cancers among men.

Respiratory Cancers – Cancers of the lung, larynx, trachea, and bronchus.

Soft Tissue Sarcoma (other than Osteosarcoma, Chondrosarcoma, Kaposi's sarcoma, or Mesothelioma) – A group of different types of cancers in body tissues such as muscle, fat, blood and lymph vessels, and connective tissues.

Loc Trang misshapen Head due to AO

Tu Vang born with out Arms due to AO

What should concerned Veterans do if they think they have been exposed to Agent Orange?

In 1978, the Veterans Administration set up a special examination program for Vietnam veterans who were worried about the long term health effects of exposure to Agent Orange. Vietnam veterans who are interested in participating in this program, known as the Agent Orange Registry, should contact the nearest VA Medical Center for a FREE examination.

What can a Veteran expect from this examination?

Veterans who participate in the examination program are asked a series of questions about their possible exposure to Agent Orange herbicides while in Vietnam. A medical history is taken, a physical examination is performed, and a series of basic laboratory tests, such as a chest X-ray (if appropriate), urinalysis, and blood tests are done. If the examining physician thinks it is medically indicated, consultations with other physicians are then scheduled.

No special Agent Orange tests are offered since there is no test to show if Agent Orange or other herbicides used in Vietnam caused a veteran's specific medical problems. There are tests that show the level of dioxin in human fat and blood, but the VA does not do such tests because there are serious questions about their value to veterans. Physicals are then scheduled. No special Agent Orange tests are offered since there is no test to show if Agent Orange or other herbicides used in Vietnam caused a veteran's specific medical problems. There are tests that show the level of dioxin in human fat and blood, but the VA does not do such tests because there are serious questions about their value to veterans.

The Blue Water Navy Vietnam Veterans and Agent Orange Exposure

From 1962 to 1971, the U.S. military sprayed herbicides, including Agent Orange, over Vietnam. Exposure to these chemicals is associated with several cancers and a variety of other health problems. The Agent Orange Act of 1991 established that veterans with any of the diseases linked to Agent Orange were presumed exposed during their service, and therefore could claim disability. The law saved veterans from the often impossible task of proving they were exposed to Agent Orange during their service. However, the Department of Veterans Affairs (VA) only compensates veterans who served on the ground or on inland waterways in Vietnam. The "Blue Water Navy"—those who served on deep water vessels—are not automatically eligible for disability benefits. In response to a growing concern from Blue Water Navy Vietnam veterans that they may have been exposed to Agent Orange during the war, the VA asked the IOM to examine whether the exposure to Agent Orange of Blue Water Navy veterans was similar to the exposure of other Vietnam veterans. Although the IOM found several plausible ways by which Blue Water Navy veterans could have been exposed to herbicides, there was not enough information for the IOM to determine whether Blue Water Navy personnel were or were not exposed to Agent Orange.

Photo # KN-1526 USS Canberra underway, 9 January 1961