

THE TWISTED TALE OF AGENT ORANGE

By Paul Sutton

This article is a lead up to the NERA conference, at which the author will make a presentation about defoliation in South Vietnam during the war. One of the issues that will be covered at the March 29th presentation is the matter of the exposure in those Naval personnel referred to as the "Blue Water Navy" — those Navy, Coast Guard and Marine Corps personnel who served off the coast of South Vietnam; but, within range and often sight of the coast whose exposure to herbicides is unique and around which veterans' advocates are currently engaged in a battle with the federal government, culminating in a suit presently being heard in the US Court of Appeals, with a decision due in the summer of 2008. The following is taken from a scientific presentation given by the author to the first ever joint US-Vietnam Conference on the use of herbicides in Vietnam, held in March 2002, in Hanoi, Vietnam.

BACKGROUND

Much of South Vietnam is covered with very dense jungle vegetation. This dense vegetation was used as cover by the forces opposing the United States and South Vietnamese armies. One means of counteracting this tactic was the use of herbicides to kill and defoliate vegetation. Herbicides were widely used to destroy enemy cover, food crops and to clear United States base perimeters of vegetation. These chemicals were applied by airplanes (Operation Ranch Hand), helicopters, trucks, riverboats and individual backpacks.

Three million acres of South Vietnam were sprayed with 50,000 tons of Agent Orange and other herbicides, containing over 500 pounds of dioxin. Because herbicides were used in Vietnam to destroy crops and defoliate jungle cover, the military used 27 times more herbicide per unit area than most domestic applications, which are primarily used to prevent weed growth. Dioxin is the focus of veterans' health concerns because of its toxicity. However, many different chemicals with the potential for producing health problems were used in Vietnam.

VETERAN EXPOSURES

There are a variety of means by which veterans could have been exposed to Agent Orange in Vietnam. Veterans may have taken part in the actual spraying which involved airplanes, helicopters, in Vietnam river boats, trucks or backpacks. They may also have been exposed to Agent Orange by consuming contaminated food or drinking water. Veterans could have been in areas while spraying occurred or in areas that were recently sprayed and areas that were sprayed and then burned. Burning increases by 25 percent the dioxin toxicity of the Agent Orange present.

EARLY RESEARCH

Agent Orange had its genesis as a defoliant in an obscure laboratory at the University of Chicago during World War II. Working on experimental plant growth at the time, Professor E.J. Kraus, chairman of the school's botany department, discovered that he could regulate the growth of plants through the infusion of various hormones. Among the discoveries he made was that certain broadleaf vegetation could be killed by causing the plants to experience sudden, uncontrolled growth. It was similar to giving the plants cancer by introducing specific chemicals. In some instances, deterioration of the vegetation was noticed within 24-48 hours of the application of the chemicals.

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. After minimal experimentation in 1961, a variety of chemical agents was shipped to Vietnam to aid in anti-guerrilla 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.

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.

Although the herbicides were widely used in the United States, they usually were heavily diluted with water or oil. In Vietnam, military applications were sprayed at the rate of three gallons per acre and contained approximately 12 pounds of 2,4-D and 13.8 pounds of 2,3,5-T. The military sprayed herbicides in Vietnam six to 25 times the rate suggested by the manufacturer.

In 1962, 15,000 gallons of herbicide were sprayed throughout Vietnam. The following year that amount nearly quadrupled, as 59,000 gallons of chemicals were poured into the forests and streams. The amounts increased significantly after that: 175,000 gallons in 1964, 621,000 gallons in 1965 and 2.28 million gallons in 1966.

AIR FORCE KNEW OF HEALTH DANGER

Scientists involved in Operation Ranch Hand and documents uncovered in the late 1980s 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. Dr. James Clary was an Air Force scientist in Vietnam who helped write the history of Operation Ranch Hand. Clary says the Air Force knew Agent Orange was far more hazardous to the health of humans than anyone would admit at the time. "When we (military scientists) initiated the herbicide program in the 1960s," Clary wrote in a 1988 letter to a member of Congress investigating Agent Orange. "We were aware of the potential for damage due to dioxin contamination in the herbicide. We were even aware that the 'military' formulation had a higher dioxin concentration than the 'civilian' version. due to the lower

cost and speed of manufacture. However, because the material was to be used on the 'enemy,' none of us were overly concerned. We never considered a scenario in which our own personnel would become contaminated with the herbicide. And, if we had, we would have expected our own government to give assistance to veterans so contaminated."

MIST DRIFT

One of the first defoliation efforts of Operation Ranch Hand was near a rubber plantation in January, 1962. According to an unsigned U.S. Army memorandum dated January 24, 1966, titled "Use of Herbicides in Vietnam," studies showed that within a week of spraying, the trees in the plantation "showed considerable leaf fall."

"The injury to the young rubber trees occurred even though the plantation was located some 500 yards away and upwind of the target at the time of the spray delivery." The memo went on to say that "vapors of the chemical were strong enough in concentration to cause this injury to the rubber." These vapors, "appear to come from 'mist drift' or from vaporization either in the atmosphere or after the spray has settled on the vegetation." 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? It developed that the distance was 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.

DEFOLIANTS DUMPED ON PEOPLE AND INTO WATER SUPPLIES

In addition to the planned dumps of herbicides, accidental and intentional dumps of defoliants over populated areas and into the water supplies was not unusual, according to government documents.

A memorandum for the record dated October 31, 1967, and signed by Col. W.T. Moseley, chief of MACV's Chemical Operations Division, reported an emergency dump of herbicide far from the intended target. At approximately 1120 hours, October 29, 1967, aircraft #576 made an emergency dump of herbicide in Long Khanh Province due to failure of one engine and loss of power in the other. Approximately 1,000 gallons of herbicide WHITE were dumped from an altitude of 2,500 feet. No mention was made of wind speed or direction, but chemicals dropped from that height had the potential to drift a long way.

The American Association for the Advancement of Science (AAAS) in the summer of 1968 sent a letter to the Secretaries of State and Defense urging a study to determine the ecological effects of herbicide spraying in Vietnam. That letter prompted a cable from Secretary of State Dean Rusk to the U.S. Embassy in Saigon. The cable, dated August 26, 1968, sought additional information but informed embassy officials of the tactic State was going to take in its reply to the AAAS. "The Department of State's proposed reply notes that the limited investigations of the ecological problem which have been conducted by agencies of the USG thus far have failed to reveal serious ecological disturbances, but acknowledges that the long-term effect of herbicides can be determined definitively only by long-term studies." Rusk suggested releasing "certain non-sensitive" portions of a study on the ecological effects of herbicide spraying in Vietnam done earlier that year by Dr. Fred H. Tschirley, then assistant chief of the Corps Protection Research Branch, Corps Research Division of the U.S. Department of Agriculture in Beltsville, Maryland. Tschirley went to Vietnam under the auspices of the State Department early in 1968 and returned with exactly the report the U.S. government and the chemical companies wanted.

Tschirley foresaw no long-term ecological impact on Vietnam as a result of the herbicide spraying. In addition, in his report of April 1968, later reprinted in part in the February 21, 1969 issue of Science magazine, Tschirley exonerated the chemical companies. "There is no evidence," Tschirley wrote, "to suggest that the herbicides used in Vietnam will cause toxicity problems for man or animals."

Rusk urged that Tschirley's report be made public. What Rusk did not mention was that Tschirley's report had been heavily edited, in essence changing its findings.

USE OF CHEMICALS CONTINUED IN VIETNAM

While the debate over the danger of Agent Orange and dioxin heated up in scientific circles, the U.S. Air Force continued flying defoliation sorties, and the troops on the ground continued to live in the chemical mist of the rainbow herbicides. They slept with it, drank it in their water, ate it in their food and breathed it when it dropped out of the air in a fine, white pungent mist.

Some of the troops in Vietnam used the empty Agent Orange drums for barbecue pits. Others stored watermelons and potatoes in them. Still others rigged the residue-laden drums for showers. The spraying continued unabated in 1968, even though, according to military records, it apparently was having minimal effects on the enemy. A series of memorandums uncovered in the National Archives and now declassified indicate that defoliation killed a lot of plants, but had little real effect on military operations.

ORANGE AEROSOL DISCOVERED

Meanwhile, the military continued to learn just how toxic Agent Orange could be. On October 23, 1969, an urgent message was sent from Fort Detrick, Maryland, to MACV concerning cleaning of drums containing herbicides. The message provided detailed instructions on how to clean the drums and warned that it was particularly important to clean Agent Orange drums. "Using the (Agent) Orange drums for storing petroleum products without thoroughly cleaning them can result in creation of an orange aerosol when the contaminated petroleum products are consumed in internal combustion engines. The Orange aerosol thus generated can be most devastating to vegetation in the vicinity of engines. Some critics claim that some of the damage to vegetation along Saigon streets can be attributed to this source. White and Blue residues are less of a problem in this regard since they are not volatile." Not only was Agent Orange being sprayed from aircraft, but it was unwittingly being sprayed out of the exhausts of trucks, jeeps and gasoline generators.

VETS BEGIN DEVELOPING 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.

STUDIES CONTRADICTIONARY AND CONFUSING

By 1983, the results of studies of Agent Orange and dioxin exposure began to trickle in. They were, for the most part, contradictory and confusing. A series of studies conducted between 1974 and 1983 by Dr. Lennart Hardell, the so-called Swedish Studies, showed a link between exposure to Agent Orange and soft tissue sarcomas and non-Hodgkin's lymphoma. And in July 1983, the US Department of Health and Human Services (HHS) released a report citing "an association" between dioxin exposure and incidence of soft tissue sarcoma. '

TEST RESULTS CONTINUE TO BE MIXED

Results of Agent Orange tests continued to be mixed. The results varied greatly, depending on who was doing the testing. In December, 1985, the Air Force released the third of its Operation Ranch Hand studies. It confirmed the other two: that there was no evidence that Agent Orange had any adverse effects on those who handled it during the war. "At this time, there is no evidence of increased mortality as a result of herbicide exposure among individuals who performed the Ranch Hand spray operation in Southeast Asia," the Air Force concluded.

After seven years of study, the CDC had made no progress on one of the most important and highly publicized issues of the war in Vietnam. In charge of the CDC study was Dr. Vernon Houk, director of the agency's Center for Environmental Health and Injury Control. The White House's Agent Orange Working Group was supposed to supervise the CDC study while the Pentagon's Environmental Support Group was charged with providing the CDC with records of Agent Orange spraying and troop deployment. Houk's CDC team complained throughout the study that those records were too spotty to make a scientific study of the effects of Agent Orange on soldiers.

Not so, said the Pentagon. Richard Christian, head of the Pentagon's Environmental Support Group, testified before Congress in mid-1986 that the records of troop movements and spraying were more than adequate for a scientific study. Christian's testimony was bolstered by two other sources. Retired Army Maj. Gen. John Murray had been asked by Defense Secretary Casper Weinberger in early 1986 to undertake a study to determine if Pentagon records were adequate for purposes of the study. After four months, Murray also determined that the records for

a comprehensive study of Agent Orange were more than adequate.

STUDY CALLED A FRAUD

But again, there was more information available that was never presented. The Institute of Medicine in the weeks before the CDC released its results of blood tests wrote a stinging rebuke of the CDC's tests methods. It said that none of the CDC's conclusions was supported by scientific data. The CDC refused to turn this report over to the White House. "Either it was a politically rigged operation or it was a monumentally bungled operation," said Rep. Ted Weiss (D-NY), chairman of the Government Operations Human Resources and Intergovernmental Relations Subcommittee. Other information began turning up that there were concerted efforts by various agencies of the government to conceal records and information about the effects of Agent Orange. Daschle learned that there were major discrepancies between a January 1984 draft of the Air Force's Operation Ranch Hand study and the February 1984 report. According to Daschle, the draft showed there were twice as many birth defects among the children of Ranch Hand participants. "The draft also reported that the Ranch Handers were less well, than the controls by a ratio of 5 to 1," said Daschle.

But these results were deleted from the final Ranch Hand report, which said there had been no adverse effects from exposure to Agent Orange. "The Air Force deleted these findings from the final report at the suggestion of a Ranch Hand Advisory Committee set up by the White House Agent Orange Working Group," said Daschle.

Air Force scientists involved in the study said they were pressured by non-scientists within the Air Force and the White House to change the results and delete critical information for the final report. Daschle says he has even obtained two versions of the minutes of the meeting in which that pressure was applied. One confirms what the scientists told him. Another set deletes that information. "What happened there was a fraud perpetrated by people whose names we still do not know," said Daschle.

In a study released March 29, 1990, the CDC admitted that Vietnam veterans face a higher risk of non-Hodgkin's lymphoma, but denied that it was a result of exposure to Agent Orange. It said the studies showed that Vietnam veterans do not have higher rates of soft tissue sarcomas, Hodgkin's disease, nasal cancer, nasopharyngeal cancer and liver cancer.

BIZARRE FINDING

One of the more bizarre aspects of this 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 of 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.