

The Lingering Story of Agent Orange

Air Force Magazine

John T. Correll

The assumption in the 1960s was that the use of herbicides in Vietnam did not pose a significant danger.

The UC-123K tactical transport known as “Patches” got its name the hard way. The aircraft was held together nose to tail with repairs to the battle damage inflicted by almost 600 hits from enemy ground gunners in Vietnam.

When its flying days were over, Patches was retired to the US Air Force Museum in Dayton, Ohio, as a memorial to the airmen who flew the dangerous “Ranch Hand” missions from 1962 to 1970.

Ranch Hand used herbicides to defoliate the vegetation in Vietnam, where the jungle provided concealment and cover for Viet Cong insurgents. It began as a peripheral notion in 1961 on a White House list of “techniques and gadgets” that might be tried in lieu of all-out combat and expanded from there.

At its peak in 1969, Ranch Hand employed only 25 spray planes, but the results and consequences went far beyond anything the White House ever imagined. Local commanders and ground forces swore by Ranch Hand, which stripped bare the enemy ambushes and hiding places. It was part of a broader operation named “Trail Dust,” which included spraying from backpacks, trucks, and riverboats, but the main operation was Ranch Hand.

The propeller-driven C-123 had long since been declared obsolescent but it found new purpose in Vietnam. In 1968, auxiliary jet engines were mounted under the wings, making takeoffs less hazardous for the heavily loaded Ranch Hand aircraft. The enhanced model was designated UC-123K.

The spraying was done from treetop level and was especially risky with the original equipment, which dispensed no more than one-and-a-half gallons of herbicide per acre, half the amount necessary for defoliation. Before the Ranch Hand crews got better sprayers that pumped three gallons an acre, they had to fly a second mission against each target. The ground gunners knew this and were waiting for them. With the improved system it took four minutes to empty the 1,000-gallon tank and cover an area 16 kilometers (10 miles) long and 80 meters (260 feet) wide.

About 10 percent of the Ranch Hand sorties destroyed crops supporting the Viet Cong—a priority for the South Vietnamese government—but the vast majority of them were flown to expose the enemy’s strongholds and travel routes. Even critics of the program concede that this saved many thousands of American and allied lives.

The Ranch Hand achievements are seldom remembered today, eclipsed by the enormous controversy about Agent Orange, the principal defoliant used in Vietnam. It is widely agreed now that the herbicides—deemed safe to humans in the 1960s—might cause cancer and other ailments. By an act of Congress in 1991, a deadly health risk is presumed for those exposed to Agent Orange.

Among other revelations, the most famous of all Ranch Hand airplanes, Patches, was found to be “highly contaminated” with Agent Orange residues and had to undergo an extensive cleanup before it could be put on display at the Air Force Museum.

A Rainbow of Defoliants

The herbicides came in 55-gallon drums marked with colored bands four inches wide. The defoliants were named for the color of the bands: Agents Blue, Green, Pink, Purple, White, and the most famous of all, Agent Orange, referred to simply as “Orange” by the Ranch Handers.

The active ingredients were the same as weed killers used for years in the United States on farms, along highways and power lines, and in popular lawn care products sold to homeowners. The compound 2,4-D destroyed broad-leaf weeds and 2,4,5-T worked on brush and hardwoods. However, unlike the commercial products which cut the weed killers with inert thinners, the military herbicides were sprayed full strength.

In the early part of the war, the preferred herbicide was Agent Purple, a patented product of the Dow Chemical Co., consisting of half 2,4-D and half 2,4,5-T. Dow could not produce enough to meet the demand but was wary about permitting others to make up the difference on license. In 1964, Ranch Hand began replacing Purple with Agent Orange, the same mixture without patent complications.

There were some complaints about the defoliation program, but these came mostly from ecologists and opponents of the war in general. Industry and the Pentagon defended the chemicals as safe. A government-sponsored survey by the independent Midwest Research Institute in 1967 found no reason for alarm. Little attention was given to scattered instances of skin rashes among plant workers, farmers, loggers, and other handlers.

Warning signals went off with the release in October 1969 of a National Institutes of Health study reporting laboratory experiments in which high concentrations of 2,4,5-T led to birth defects in mice.

The basic problem was not the weed-killing ingredients themselves; it was the “dioxins,” a kind of impurity created in small amounts as byproducts in the manufacturing process. Dioxins are everywhere—in diesel exhaust, in Styrofoam cups and Formica tabletops, in smoke from trash fires—and toxic in extreme doses. Production of 2,4,5-T generated a poisonous dioxin abbreviated as TCDD.

In response to the NIH study, the Department of Defense prohibited the use of Agent Orange around population centers. In April 1970, the departments of the Interior, Agriculture, and Health, Education, and Welfare suspended the uncontrolled use of 2,4,5-T in the United States and the DOD—over the objections of the Joint Chiefs of Staff—temporarily halted the use of Agent Orange in Vietnam. The temporary halt was never lifted, and when supplies of other herbicides, chiefly Agent White, ran out, the Ranch Hand operation came to an end.

A Spark in Chicago

As it turned out, the interdepartmental restrictions on 2,4,5-T in April 1970 did not amount to that much. They did not affect use for control of weeds and bush on range, pasture land, forest, or rights of way on nonagricultural land. Nor did they apply to products for sale to homeowners. The Agriculture Department and the Environmental Protection Agency saw no “imminent hazard” from 2,4,5-T.

To some extent, this reflected the political power of the chemical and agricultural industries but, at the same time, the scientific evidence about 2,4,5-T was ambiguous.

The Agent Orange controversy as it exists today began in Chicago in 1978. Maude de Victor, a benefits counselor in the local Veterans Administration office, put together a file on 57 cases of Vietnam veterans whose problems she believed to be related to chemicals in Vietnam. She shared her suspicions with a TV news producer whose documentary, “Agent Orange: The Deadly Fog,” was broadcast by WBBM, the CBS affiliate in Chicago, in March 1978.

Within weeks, VA got 500 claims for exposure to Agent Orange, 300 of them from Chicago and the other 200 from Arkansas, where veterans picked up the message and repeated it.

The issue soon went national, focusing largely on Army ground troops who said they had been exposed to the herbicides. Some of the news accounts exaggerated the circumstances, depicting the jungle as “dripping” or “drenched” with herbicides, hardly possible with a maximum dispersal rate of three gallons per acre, which works out to less than a teaspoon per square foot.

Nevertheless, there was enough substance for the issue to gain traction in Congress and in public opinion. Politicians made speeches and President Jimmy Carter formed an Agent Orange Inter-Agency Working Group that was eventually elevated to cabinet council status.

In 1979, the Environmental Protection Agency stopped most use of 2,4,5-T, declaring it unavoidably contaminated by dioxins. The EPA action came just before the annual spraying season, when seven million pounds of 2,4,5-T were to have been spread on forests, pastures, and along power lines and highways.

A number of newly formed veterans groups took up the charge, notably the Vietnam Veterans of America, a mainstream offshoot of the Vietnam Veterans Against the War. In 1979, lawyers representing the veterans filed a class action lawsuit against Dow and six other Agent Orange manufacturers.

The case never went to trial, settled instead in 1984 when the companies agreed to establish a \$180 million fund for Vietnam veterans and their families. The chemical companies did not acknowledge any fault, but the net effect was a significant blemish on the image of the industry.

In 1983, Dow abandoned the effort to have 2,4,5-T declared safe. Production had stopped after the EPA ban in 1979, but this decision also ended sales from inventory, which had continued.

In 1984, Congress adopted the Dioxin Standards Act, which required VA to develop regulations for disability compensation to veterans exposed to Agent Orange. It stipulated that claimants should be given the benefit of the doubt in resolving the determination of claims.

Sifting The Evidence

The evidence against 2,4,5-T and dioxins was mounting but the data came either from laboratory experiments or situations in which civilians were exposed to herbicides other than Agent Orange in places other than Vietnam. Beginning in the 1980s, two large-scale government efforts sought to determine specifically the effects on US veterans.

The best such assessment was the Air Force Health Study, conducted between 1982 and 2003. With the help of the Ranch Hand Vietnam Association, the Air Force gained the volunteer participation of 1,150 former Ranch Handers, nearly all of the survivors from the total of 1,269 pilots, navigators, flight mechanics, and ground personnel who served with the organization in Vietnam (77 of the Ranch Handers were already deceased, 27 of them killed in action).

These men, in close daily contact with the herbicides for the length of their tours, had greater exposure to Agent Orange than anyone else. They took rigorous physical examinations at regular intervals over the course of 20 years, and their health was compared with a control group of 1,300 airmen who flew similar aircraft (C-130s) in Southeast Asia at the same time but who did not handle herbicides.

The Ranch Handers had dioxin levels much higher than the control group or the general US population, but except for a statistical association with diabetes—for which other causes could not be ruled out—there was nothing different or unusual about their health.

Retired Col. Ralph C. Dresser, commander of Ranch Hand from 1965 to 1966, is among those skeptical of the dangers attributed to Agent Orange. The Ranch Handers had been assured that the herbicides could be used without harm to humans or animals. "To make this point as Ranch Hand commander, I would dip my fingers into an open Orange barrel and rub the substance on my lips and tongue," Dresser says. "While it tasted like hell, I have suffered no ill effects and I am 84 years old."

The limitation of the Air Force study was that it included only airmen. That gap was supposed to be closed by the congressionally mandated Vietnam Experience Study, conducted from 1983 to 1987 by the Centers for Disease Control on contract to VA.

CDC interviewed and examined thousands of Army Vietnam veterans and for comparison, a large control group who did not serve there. The results were muddled. The study was unable to distinguish those exposed to herbicides from those who were not, in part because the CDC scientists did not understand troop movement data and other military matters and stubbornly refused military help in interpreting the information.

The study was canceled as impossible to complete in October 1987. Congressional Democrats charged that it was designed to fail and had been obstructed by political interference.

The most vehement critic was retired Navy Adm. Elmo R. Zumwalt Jr., former chief of naval operations, who had ordered the extensive spraying of Agent Orange when he was commander from 1968 to 1970 of the “brown water” naval forces patrolling the Vietnam coasts, harbors, and rivers. One of his swift boat commanders was his son, Elmo R. Zumwalt III, who died of cancer at age 42 in 1988. Zumwalt was convinced that the cause was Agent Orange.

In 1989, Zumwalt was appointed special assistant on Agent Orange issues to his friend, Edward J. Derwinski, the secretary of Veterans Affairs. Testifying in that capacity in 1990, Zumwalt told Congress that the CDC study and the Air Force study were “absolutely without merit.”

Zumwalt said, “The sad truth that emerges from my work is not only that there is credible evidence linking certain cancers and other illnesses with Agent Orange, but that government and industry officials credited with examining such linkage intentionally manipulated or withheld compelling information of the adverse health effects associated with exposure to the toxic contaminants contained in Agent Orange.”

Principle of Presumption

For more than 10 years, Congress had been asking questions about Agent Orange and not getting many answers. Patience was running out and the ire on Capitol Hill was bipartisan.

In February 1991, the Agent Orange Act passed the Senate by a thumping vote of 99-0 and the House by 412-0. The law said that any veteran of military, naval, or air service in Vietnam would be “presumed to have been exposed” to a herbicide containing dioxins and that there would be a “presumption of service connection” if the veteran contracted a disease specified in the act. Three such medical conditions were listed: non-Hodgkins lymphoma, soft tissue sarcoma, and chloracne.

The law further assigned primary responsibility for Agent Orange to VA—redesignated in 1989 as the Department of Veterans Affairs but keeping its old initials—and named the National Academy of Sciences to review and evaluate “available scientific evidence” and advise VA. If warranted, VA could add to the list of diseases.

That stood the controversy on its head. Questions about exposure to Agent Orange and its effects were no longer relevant. All that mattered was which veterans and which diseases qualified for the presumption.

The recognized authority for establishing connections between veterans' illnesses and Agent Orange became the Institute of Medicine (IOM), the health arm of the National Academy of Sciences. IOM did not conduct its own research, relying instead on studies done by others. So far, IOM has made nine biennial reports, the most recent one released in December 2013.

The original list of three presumptive diseases has now grown to 14. Of these, six are types of cancer, including prostate cancer, which VA acknowledges to be "one of the most common cancers among men."

In 2010, VA secretary retired Army Gen. Eric K. Shinseki said some members of Congress had objected to the addition of diseases that occur frequently in the general population but that the law did not allow him to exclude an ailment from presumption based on how common it is. Nevertheless, VA did not add high blood pressure of 140/90 or above, which was included in the IOM 2006 update, or stroke, which was in the 2013 report.

Of the 14 conditions on the VA presumptive list, IOM says that five meet a standard of "sufficient evidence of an association" and nine provide "limited/suggestive evidence of an association." IOM says that in none of the 14 instances is the evidence strong enough to definitively rule out other explanations for the findings.

"Brown water" sailors who operated on Vietnam's internal waterways are included in the VA presumption but "blue water veterans" who served offshore are not. There is a continuing challenge, with some support in Congress, to extend coverage and benefits to those who served in the "territorial seas" within 12 miles of the Vietnam coast. IOM says there were several "plausible routes" for Agent Orange exposure to reach that far, including spread of the spray by drifting winds.

More Exposures Exposed

In recent years, the Agent Orange issue has transcended Vietnam. The "significant use" of herbicides around US bases in Thailand was disclosed by a Freedom of Information Act case in 2010. This spraying was done by ground units to eliminate vegetation for security purposes. VA now awards compensation on a case-by-case basis to those whose duty was at or near the perimeter of these bases.

VA also presumes the exposure of veterans who served between 1968 and 1971 in areas near the Demilitarized Zone in South Korea, where South Korean soldiers sprayed Agent Orange and other herbicides.

However, the most dramatic new challenge involves the old Ranch Hand airplanes, which were configured back to standard C-123s when the Vietnam War ended and were flown by US Air Force Reserve units in the United States for 10 years. These crews are now exhibiting the same illnesses attributed elsewhere to Agent Orange. Some of the aircraft—including Patches, which had to be decontaminated before going on display at the Air Force Museum—were found to be carrying residues of Agent Orange.

“In 2010, the Air Force destroyed 18 of the Vietnam-era aircraft in part because of concerns about potential liability for Agent Orange, according to Air Force memos documenting the destruction,” Steve Vogel of the Washington Post reported in August 2013.

The aircraft were shredded at Hill AFB, Utah, and the aluminum remains were destroyed at a furnace in Michigan heated to nearly 1,400 degrees to be sure the dioxin residues were gone.

A hazardous waste manager at Hill said that “Ben and Jerry’s ice cream has more dioxin than these aircraft,” but Vogel obtained several Air Force documents that indicated deeper complications.

Vogel quoted a memo in which a consultant advised recycling or disposing of the aircraft “as soon as possible to avoid further risk from media publicity, litigation, and liability for presumptive compensation.” Another memo said, “Smelting is necessary for these aircraft so the Air Force will no longer be liable for ‘presumptive compensation’ claims to anyone who ever worked around this ‘Agent Orange’ metal.”

In 2013, VA reversed its denial of an Agent Orange-related claim by a pilot who had flown Patches, often eating and sleeping on the aircraft, and who had since developed cancer. Subsequently, VA considered C-123 contamination claims on a case-by-case basis, but took the position that post-Vietnam exposures to these aircraft “were unlikely to have put aircrew or passengers at risk.” The effects differ from direct contact with Agent Orange in liquid or spray form. “In the dry form—for example, adhered to a surface—Agent Orange residue cannot be inhaled or absorbed through the skin and would be difficult to ingest,” VA said.

A finding by the Institute of Medicine on the C-123 contamination residues was expected but had not been announced as this article went to press in December. If IOM reports a connection between the contamination and the Reservists’ medical problems, VA must then make a determination about the status of the claimants.

The Prevailing Conclusion

The controversy, such as it is, rolls on. There is no doubt that the veterans have the health problems specified. However, the extent to which their illnesses were caused by exposure to Agent Orange as opposed to other causes cannot be determined. In a broader sense, the principle of presumption makes the question of little or no importance.

"It's safe to assume that dioxin isn't responsible for all of the lung cancer, ischemic heart disease, diabetes, and other ailments common to aging populations that now afflict Vietnam veterans," says Peter Sills, an attorney who helped represent the Vietnam Veterans of America in the class action lawsuit. "But the government's insistent, unsupportable attempts to prove that herbicides haven't harmed its soldiers have made it impossible to tell which of these illnesses are service-related. In avoiding its responsibilities, the government has found itself under a far greater obligation than it would have faced if the job had been done correctly in the first place."

Reports abound of Vietnamese civilians with birth defects and various illnesses said to be caused by exposure to herbicides. However, there is no data to distinguish between the possible effects of Agent Orange and other explanations for health problems in rural Vietnam in the 1960s, and the US government has not acknowledged any responsibility.

The overwhelming consensus of the medical-scientific community is that the Agent Orange dioxins cause cancer and other diseases and was responsible for these conditions among Vietnam veterans. The news media is almost universal in subscribing to the case against Agent Orange and public opinion is not far behind.

Nobody, including VA, has an accurate handle on the scope of Agent Orange claims, but new cases in the past five years alone number in the hundreds of thousands with retroactive benefit payments to veterans and their survivors reaching well into the billions of dollars.

The end of the Agent Orange story is not yet in sight.