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Long Overlooked Historical Information On Agent Orange And Tcdd Following Massive Applications of 2,4,5-t-containing herbicides, eglin air force base, florida.

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[Abstract](#)

BACKGROUND:

From 1961-1971, The Air Development Test Center, Eglin Air Force Base (AFB), Florida, developed, tested, and calibrated the aerial spray systems used in support of Operation RANCH HAND and the US Army Chemical Corps in Vietnam. Twenty major test and evaluation projects of aerial spray equipment were conducted on four fully instrumented test grids, each uniquely arrayed to match the needs of fixed-wing, helicopter, or jet aircraft. Each of the grids was established within the boundary of Test Area 52A of the Eglin Reservation.

METHODS:

The tests, conducted under climatic and environmental conditions similar to those in Vietnam, included the use of the military herbicides (Agents) Orange, Purple, White, and Blue. Approximately 75,000 kg of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) and 76,000 kg of 2,4-dichlorophenoxyacetic acid (2,4-D) were aerielly disseminated on an area of less than 3 km² during the period 1962-1970. Data from the analysis of archived samples suggested that an estimated 3.1 kg of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), present as a contaminant, were aerielly released in the test area. Because most of the vegetation had been removed before establishing the test site in 1961, there was an opportunity to follow ground-based residues independent of canopy interception, and the resulting high solar exposure of initial residues. Studies of the soils, fauna, flora, and aquatic ecosystems of the test grids and associated perimeters of Test Area C-52A (an area totally more than 8 km²) were initiated in 1969 and concluded in 1984.

RESULTS AND DISCUSSION:

Data from soil samples collected from 1974 through 1984 suggested that less than one percent of the TCDD that was present in soil when sampling began persisted through the ten-year period of sampling. More than 340 species of organisms were observed and identified within the test area. More than 300 biological samples were analyzed for TCDD and detectable residues were found in 16 of 45 species examined. Examination of the ecological niches of the species containing TCDD residues suggested each was in close contact with contaminated soil. Indepth field studies, including anatomical, histological and ultrastructural examinations, spanning more than 50 generations of the Beachmouse, *Peromyscus polionotus*, demonstrated that continual exposure to soil concentrations of 0.1 to 1.5 parts-per-billion (ng/g) of TCDD, had minimal effects upon the health and reproduction of this species.

CONCLUSIONS:

Since Agent Orange with its associated TCDD contaminant was aerielly disseminated on the test grids, Test Area C-52A provided a 'field laboratory' for what may have happened in Vietnam, had there been no intercepting forest cover. However, in Vietnam a 'typical' mission would have disseminated 14.8 kg of 2,4,5-T/ha, most of which was intercepted by the forest canopy, versus the 876 kg 2,4,5-T/ha on the test grid at Eglin. Moreover, each hectare on the Eglin test grid received at least 1,300 times more TCDD than a hectare sprayed with Agent Orange in Vietnam. The disappearance or persistence of TCDD is dependent upon how it enters the ecosystem. Spray equipment test and evaluations missions at Eglin were generally scheduled and conducted with environmental conditions that were optimal for spray operations. This suggests that conditions favorable for dissemination of herbicide were the same conditions favorable for photodegradation of TCDD. It was likely that 99 percent of the TCDD never persisted beyond the day of application. No long-term adverse ecological effects were documented in these studies despite the massive quantities of

herbicides and TCDD that were applied to the site. Reviews by the US Environmental Protection Agency and the National Academy of Sciences' Institute of Medicine did not address the fate of Agent Orange and TCDD as described in these studies from Eglin AFB, Florida.

Comment in

- [The story of 2,4,5-T: a case study of science and societal concerns.](#) [Environ Sci Pollut Res Int. 2004]