Vuktor Yushchenko, Ukrainian presidential candidate poisoned by dioxin, 2004.

It originates as a byproduct of the deliberately accelerated manufacture of the weed killer 2,4,5-T. It acts on humans by altering the transcription of specific genes. And the results aren't pretty.

Often, when we are talking about the long-term impacts of Agent Orange on human health and the environment, we are actually talking about dioxin. Specifically, the 2,3,7,8-Tetrachlorodibenzodioxin (TCDD),which was an unnecessary contaminant in the 2,4,5-T component of Agent Orange, and several of the other herbicides (Pink, Purple, and Green). Therefore, it is important to have clarity on two terms used throughout this website:

Agent Orange — (aka Herbicide Orange) was one of a class of color-coded herbicides that US forces sprayed over the rural landscape in Vietnam to kill trees, shrubs and food crops over large areas. Agent Orange was a 50/50 mixture of two individual herbicides, 2,4-D and 2,4,5-T. It remained toxic over a short period—a scale of days or weeks—and then degraded. The production of Agent Orange was halted in the 1970s, existing stocks were destroyed and it is no longer used. Production of the 2,4,5-T component of Agent Orange was also halted in the 1980s in most countries. However, 2,4-D is still produced by Dow Agroscience and is a common component of over 70 products, including Scott's Weed and Feed, Miracle-Grow Weed and Feed, Weed B Gone and many others.

The effects of Agent Orange do, however, persist in the form of ecologically degraded landscapes in parts of the hilly and mountainous areas of Vietnam. The pre-war forests that existed in most of these areas took hundreds of years to reach an ecologically-balanced mixture of large numbers of species of flora and fauna. Natural regeneration would take centuries to reproduce those landscapes. In addition, in some of the sprayed areas soil erosion and landslides have sharply lowered soil nutrient levels and altered thetopographical features of the landscape. These changes have encouraged a few species of invasive grasses of low value. Active replanting with species of trees and shrubs which are ecologically viable and have economic value will require substantial and sustained long term investment.

Dioxin — is a member of the class of persistent organic pollutants that is produced through combustion, in the bleaching of paper/pulp or in the chemical manufacturing process. In regards to Agent Orange dioxin was a by-product of the deliberately accelerated production of the herbicide 2,4,5-T, one of the components of Agent Orange. Specifically the dioxin contaminating Agent Orange was 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) which is the most toxic of all the dioxins and dioxin-like compounds. The US National Toxicology Program (NTP) and the International Agency for the Research on Cancer list TCDD as a known human carcinogen. Dioxin has been found to be an endocrine disrupter, it can cause chloracne, certain cancers, and reproductive and developmental effects (at least in animals).

Dioxin is not absorbed by plants nor is it water soluble. It can attach to fine soil particles or sediment, which are then carried by water downstream and settle in the bottoms of ponds and lakes. It continues to adversely affect people who eat dioxin-contaminated fish, molluscs and fowl produced around point sources of dioxin called dioxin "hot spots." The good news is that for the most part as environmental restriction on emissions of dioxin and dioxin – like compounds have been tightened the levels of dioxin in the environment has decreased over the past 30 years. However, dioxin is toxic over a long period – a scale of many decades – and does not degrade readily. The half-life of dioxin varies depending on where it is found, in humans the half life is between 11 and 15 years, in surface soil that has been fully exposed to sunlight the half-life is between 1 and 3 years and in **sediment the half-life can be more than 100 years.**

"A few grains of salt dissolved in an olympic-size swimming pool."

– Philip Jones Griffiths, "Agent Orange:

Collateral Damage in Viet Nam," 2004.

The average person in an industrialized nation has 3-7 pg/g (picograms/gram) of TCDD in their blood, primarily through environmental exposure to dioxin from combustion, and by eating dioxin contaminated meat, dairy and fish. In comparison, the average Ranch Hander, the type of veteran who handled the contaminated chemicals, had an estimated 12.2 pg/g of dioxin in his blood when it was measured twenty-years after his exposure in Vietnam. Those at most risk to adverse health effects of dioxin are those who were exposed to high levels through industrial accidents, by frequently eating fish and animals that have been feeding in dioxin hotspots, or who were exposed to dioxin-contaminated herbicides such as Agent Orange. Dioxin's continuing impact can be slowed or halted by cutting the dioxin exposure pathways in the human food chain, and by environmental remediation of contaminated sites.

Unfortunately there is no known "safe–level" of dioxin exposure; if dioxin permanently alters the intricate internal cellular and chemical balances involved in maintaining good human health, there is serious risk of life-long health problems, which may ultimately lead to mortality. Scientists are still trying to understand how dioxin may adversely affect health or cause reproductive and developmental abnormalities in humans. It is hoped that as epigenetic research continues to evolve, answers may finally be found as to how dioxin may alter the expression of genes.