

The History, Use, Disposition and Environmental Fate of Agent Orange

Alvin L. Young

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 Springer

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The History, Use, Disposition and Environmental Fate of Agent Orange
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ISBN 978-0-387-87485-2 e-ISBN 978-0-387-87486-9
DOI 10.1007/978-0-387-87486-9

Library of Congress Control Number: 2008939877

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Printed on acid-free paper

springer.com

Preface

For almost four decades, controversy has surrounded the tactical use of herbicides in Southeast Asia by the United States military. Few environmental or occupational health issues have received the sustained international attention that has been focused on Agent Orange, the major tactical herbicide deployed in Southern Vietnam. With the opening and establishment of normal relations between the United States and the Socialist Republic of Vietnam in 1995, the time has come for a thorough re-examination of the military use of Agent Orange and other “tactical herbicides” in Southern Vietnam, and the subsequent actions that have been taking place since their use in Vietnam.

The United States Department of Defense has had the major role in all military operations involving the use of tactical herbicides, including that of Agent Orange. This included the Department’s purchase, shipment and tactical use of herbicides in Vietnam, its role in the disposition of Agent Orange after Vietnam, its role in conducting long-term epidemiological investigations of the men of Operation RANCH HAND, and its sponsorship of ecological and environmental fate studies. This book was commissioned by The Office of the Deputy Under Secretary of Defense (Installations and Environment) with the intent of providing documentation of the knowledge on the history, use, disposition and environmental fate of Agent Orange and its associated dioxin.

A large body of historical records and other data exist on the use of Agent Orange in Vietnam. Many of these primary historical records are now openly available, and they permit a comprehensive assessment of the procedures and supporting historical data related to spraying of herbicides in Vietnam. An extensive collection of environmental data has been assembled on Agent Orange and its associated dioxin. These data provide insight into the mechanisms of dissipation and degradation as they relate to the distribution and bioavailability of the herbicides and dioxin in the environment, i.e., issues related to human exposure. Procurement records from the United States Air Force and Defense Supply Agency, complemented by records from the Chemical Companies that produced the tactical herbicides, and from the National Institute for Occupational Safety and Health, permit new estimates on both the quantities of tactical herbicides sprayed in Vietnam and on the level of dioxin in those inventories. Lastly, workshops between the United States Department of

Defense and Vietnam's Ministry of National Defence have opened a dialogue on how the two governments can work together to resolve the remaining controversy over Agent Orange and "dioxin hot spots" in Southern Vietnam.

It is hoped that the history and science described in this book can correct many of the misperceptions about the use of tactical herbicides in Vietnam. In particular the science of the degradation of the herbicides and its associated dioxin and historical records, have not yet received the recognition in the debates of the issues that they should. It is my hope that this discussion and this book will make a positive contribution to society's effort to put the Vietnam War behind us and to look to the future relationships between both countries and their peoples.

1 July 2008

Alvin L. Young, Ph.D.

Acknowledgments

First, I want to thank the United States Air Force and the United States Government for giving a young man from the prairies of Wyoming the opportunity to have an exciting career for 40 years in environmental chemistry and toxicology of pesticides and related materials.

For those of us who went to college in the 1960s, the Vietnam War was a major social and political issue. I was a ROTC (Reserve Officer Training Corps) cadet at the University of Wyoming and 1964 was the year of my commissioning and graduation, and it was the year that the War became a national commitment. Because I was a graduate from the College of Agriculture, I was aware of the military's interest in herbicides. Accordingly, I contacted Air University and was given the opportunity to seek a PhD in Herbicide Physiology/Environmental Toxicology at Kansas State University. In 1968, I reported for active duty at Eglin Air Force Base, Florida where I had the opportunity to work closely with the men of Operation RANCH HAND in the evaluation of the aerial spray equipment that was continually being upgraded for use in Vietnam.

I also had the opportunity to conduct the first ecological studies on the dioxin contaminant in Agent Orange. While at Eglin, I began to collect documents on the tactical herbicides Orange, White, and Blue, on their use in Vietnam, and on subsequent studies related to their disposition, environmental fate, and toxicology. During the next 20 years the collection continued to develop as I advanced in my Air Force career. Eventually the size of the collection became large, and I was fortunate in having the interest of the Special Collections Division of the National Agricultural Library, Agricultural Research Service, Beltsville, Maryland. The Air Force School of Aerospace Medicine graciously provided funds to have the collection (>5,850 documents, reports, articles, photographs, and maps) placed into an electronic database, so that it could support the literature needs of the ongoing Air Force Health Study (the RANCH HAND Epidemiological Study). Thus, my thanks to the National Agricultural Library and to Sarah H. Fugate and Patricia Murphy for establishing "The Alvin L. Young Collection on Agent Orange." The collections is located at the following web site: <http://www.nal.usda.gov/speccoll/findaids/agentorange/intro.htm>.

The collection at the National Agricultural Library is one of two primary sources for this book. The other primary source is the Armed Forces Pest

Management Board's Literature Retrieval System. The Literature Retrieval System houses more than 150,000 electronically available documents, reports, and books on pests, pesticides, and AFPMB's worldwide studies. The AFPMB's Literature Retrieval System is located at the following web site: <http://www.afpmb.org>

The unique nature of this book is enhanced through the outstanding photographs and first-hand accounts of all phases of the various tactical herbicide operations and research. Many of the details and photographs of RANCH HAND missions were provided by men who served in Operation RANCH HAND in Vietnam. I am especially indebted to Lt. Colonel Paul F. Cecil, USAF (RET), Ph.D, Military Historian, who provided great assistance in reviewing and commenting on Chapter 3. The other men of Operation RANCH HAND that I wish to acknowledge are Major John "Jack" Spey, USAF (RET); Colonel Ralph Dresser, USAF (RET); Lt. Colonel James Pochurek; and, to the RANCH HAND Vietnam Association. I wish to acknowledge the experience and knowledge shared by men who served as Forward Air Controllers for RANCH HAND missions, especially Colonel Charles "Chuck" Hines, USAF (RET) and Lt. Colonel Leo Tibbitts, USAF (RET). Thanks also to Lt. Colonel Warren Hull, USAF (RET), BSC, for information on Project PACER IVY, and to Major James W. Tremblay, USAF (RET), BSC, who contributed photographs and details on Operation PACER HO. I am grateful for the special scientific expertise of Lt. Colonel Charles "Charlie" E. Thalken, USAF (RET), VC, and Lt Colonel Lorris G. Cockerham, Ph.D., USAF (RET), Colonel Robert Clegern, Ph.D., BSC, USAF (RET), and Colonel William Cairney, Ph.D., USAF (RET) in the conduct of ecological studies at Eglin AFB, Florida, and the Site Monitoring Programs at the Naval Construction Battalion Center, Gulfport, Mississippi, and Johnston Island, Central Pacific Ocean. I wish to give a special thanks to Mr. J. Ray Frank, Frederick, Maryland (formerly with the US Army Chemical Corps, Fort Detrick, Maryland) for many of the photographs included in the book.

I wish to acknowledge the opportunity provided me by Dr. James L. Regens to serve as a Visiting Professor and Senior Fellow with the Institute for Science and Public Policy, Sarkeys Energy Center, The University of Oklahoma, Norman, Oklahoma. Dr. Regens and his Research Associate James T. Gunter encouraged and provided a forum for me to document the history of Agent Orange. Dr. Regens is now Presidential Professor, Occupational and Environmental Health, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma. A special appreciation is also given to Dr. Nathan Karch, Exponent, Inc., Washington DC for the many excellent suggestions that contributed to improving the book.

I wish to acknowledge the Program Manager for this project, Mr. Willam J. Van Houten, Environmental Readiness and Safety Group, Office of the Under Secretary of Defense, Washington, DC, and to the Project Manager, Mr. William B. Andrews, Battelle Memorial Institute, Richland, Washington.

It was great pleasure to travel to Hanoi, Vietnam and participate with them in Workshops on “Agent Orange and Dioxin Remediation”.

In conclusion, I wish to acknowledge my colleagues, the men and women who served with honor and distinction in the War in Vietnam. May their sacrifices never be forgotten!

Colonel, USAF (RET)
1 July 2008

Alvin L. Young, Ph.D.

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Alvin L. Young Biographical Sketch, 2008

For 40 years, Dr. Alvin L. Young has collected documents, reports, and photographs on the use, disposition, and environmental fate of Agent Orange and other tactical herbicides used in the Vietnam War. He has published or edited four books and more than 70 peer reviewed publications, commentaries, and editorials on the herbicides (and the associated dioxin contaminant) used in Vietnam. He completed his PhD in Herbicide Physiology and Environmental Toxicology at Kansas State University in 1968. He began his Air Force career as a Project Scientist with the United States Air Force in 1968, evaluating both the dissemination characteristics of the Air Force aircraft and the fate of the herbicides used in South Vietnam. In his 21 years with the Air Force (obtaining the rank of Colonel), he was involved with all phases of the Agent Orange Controversy, from test and evaluation of equipment to environmental fate and health impacts. During his years as Associate Professor at the United States Air Force Academy (1971–1977), Colorado Springs, Colorado he conducted studies on the environmental fate of TCDD including studies on the biodegradation of massive quantities of Agent Orange.

From 1977 to 1983, Dr. Young was affiliated with the Epidemiology Division, The School of Aerospace Medicine, Brooks AFB, Texas, and the Environmental Epidemiology Unit of the Department of Veterans Affairs, Washington, DC. His primary responsibilities were the documentation and establishment of exposure assessment protocols for the epidemiological studies of Vietnam veterans. From 1983 to 1987, Dr. Young was assigned to the Executive Office of the President, Washington, DC, where he provided advice to the White House on the issues of Agent Orange and Dioxins. From 1987 to 1997, he was a Science Advisor for the United States Department of Agriculture. From 1997 to 2001, he was the Director, Center for Risk Excellence, United States Department of Energy, Argonne, Illinois. From 2002 through 2007 he was a Visiting Professor and Senior Fellow with the Institute for Science and Public Policy, The University of Oklahoma, Norman, Oklahoma. He currently is President, A. L. Young Consulting, Inc., Cheyenne, Wyoming. His scientific specialty is on the use, toxicology, and human and environmental risks associated with the military herbicides used in South Vietnam, 1961–1972.

Dr. Young has traveled, lectured, attended and sponsored conferences and workshops in 32 countries speaking on issues related to Agent Orange and TCDD, ecological studies, environmental toxicology, and biotechnology. He has served as a Co-editor for four different journals and has more than 300 publications in the scientific literature. He is currently the Editor-in-Chief of the *International Journal Environmental Science and Pollution Research*. He maintains a Special Collection on Agent Orange at the USDA's National Agricultural Library, Beltsville, Maryland, at: <http://www.nal.usda.gov/speccoll/findaids/agentorange/index.htm>