Agent Orange: Herbicide Tests and Storage in the U.S.

Agent Orange and other herbicides used in Vietnam were tested or stored elsewhere, including many military bases in the United States. Below is information from the Department of Defense (DoD) on projects to test, dispose of, or store herbicides in the U.S. For projects outside the U.S., go to Herbicide Tests and Storage Outside the U.S.

Arizona

Location: Pinal Mountains near Globe, AZ
Project Description: In 1965, the USFS began a land improvement program in the Pinal Mountains. The program called for spraying an area of chaparral with herbicides to accomplish the objectives of multiple land use.
Agents: 2,4-D isooctyl-ester, 2,4,5-t isooctyl-ester, silvex, propyleneglycolbutylether ester, 2,4,5-T butyl ester, 2,4,5-T 2-e-he
DoD Involvement: No

Arkansas

Location: Fort Chaffee, AR
Project Description: During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Derrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI.
Agents: Basic, in-house, improved desiccants and Orange, Blue
DoD Involvement: Yes

California

Location: Brawley, CA
Dates: 1950-51
Project Description: The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Here, irrigation water studies were done with the agent. H.F. Arle worked here.
Agents: 2,4-D
DoD Involvement: Undetermined

Florida

Location: Orlando, FL; Cocoa, FL
Dates: 1944
Project Description: Tests were conducted in 1944 by the Army in Orlando and Cocoa areas of Florida to determine the value of ammonium thiocyanate and chloride as marking and defoliation agents. They were conducted initially at ground level and later from aircraft.
Agents: Ammonium thiocyanate and zinc chloride
DoD Involvement: Yes

Location: Near Lake George, FL
Dates: Spring 1944
Project Description: The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Spraying here.
Agents: Zinc chloride
DoD Involvement: Yes

Location: Orlando, FL at Army Grove Air Force's Tactical Center
Dates: 3/14/1944, 4/12/1944
Project Description: The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent.
Agents: Ammonium thiocyanate, zinc chloride, sodium nitrate, sodium arsenate, sodium fluoride
DoD Involvement: Yes
Location: Marathon, FL  
Project Description: The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Spraying was done here.  
Agents: Zinc chloride, ammonium sulphamate, ammonium thiocynate  
DoD Involvement: Yes

Location: Bushnell Army Air Field, FL  
Dates: 2/1945  
Project Description: Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was aerial spray experiments on potted plants.  
Agents: LN *phenoxy  
DoD Involvement: Yes

Location: Avon Air Force Base, FL  
Dates: 2/1951 - 4/1951  
Project Description: Trials were conducted at Avon Air Force Base, FL by Chemical Corps with personnel of the Air Force and Navy to determine the practical effectiveness of spraying pure anticrop agents from at low volume from aircraft. C-47 and Navy XBT2D-1 aircraft with various nozzles were used.  
Agents: Butyl 2,4 D  
DoD Involvement: Yes

Location: Englin Air Force Base, FL  
Dates: 11/1952 - 12/1952  
Project Description: Two trials: Chemical Corps- concerned with basic fundamental work, using 2,4-D, Air Force-concerned with evaluating prototype large capacity spray system for aircraft installation using 2,4,5-T, primarily. Used 3 atomizing nozzles: Bete Fog Nozzles, Whirljet Spray Nozzles, and Fogjet 1.5F50.  
Agents: 2,4-D, 2,4,5-T: 143 and 974, respectively  
DoD Involvement: Yes

Location: Avon Park Air Force Base, FL  
Dates: Spring 1954  
Project Description: Series of tests were conducted at Avon Park AFB during the spring of 1954 to study the behavior of chemical anticrop aerial sprays when released from high-speed jet aircraft. The Navy F3D jet fighter was used with Aero 14A Airborne Spray Tanks to disperse the anticrop agents.  
Agents: Butyl 2,4-D, butyl 2,4,5-T, Isopropyl 2,4-D  
DoD Involvement: Yes

Location: Jacksonville, FL  
Dates: 7/18/1962 - 7/21/1962  
Project Description: The HIDAL was used successfully on an H-34 helicopter to spray herbicidal materials. Therefore, it had not been calibrated previously. Spray tests were performed to do so. This was done under order by OSD/ARPA.  
Agents: Purple, Fuel Oil, Mix  
DoD Involvement: Yes

Location: Eglin AFB, FL, C-52A test area  
Dates: 1962-70  
Project Description: CPT John Hunter discussed vegetation changes and ecological studies of the 2 square mile test area which had been sprayed with herbicides over the period 1962-70.  
Agents: Orange (1962-68), Purple (1962-68), White (1967-70), Blue (1968-70)  
DoD Involvement: Yes

Location: Apalachicola National Forest near Sophoppy, FL  
Project Description: During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI.  
Agents: Basic desiccants and Orange/Blue  
DoD Involvement: Yes

Location: Eglin AFB, FL  
Project Description: A spread factor study was performed by the Army to correlate the spherical drop sizes of both Orange and Stull Bifluid defoliants. It involved development of new techniques to determine spread factors over an extended range of drop sizes. A spinning cup drop generator was used.  
Agents: Orange, Bifluid #1, Bifluid #2, Stull Bifluid  
DoD Involvement: Yes

Agent Orange: Herbicide Tests and Storage in the U.S. - Office of Public Health and Environmental Affairs - Department of Veteran Affairs
Location: 2 areas in FL, 2 areas in GA, and 1 in TN  
Dates: 1968  
Project Description: In 1968, emphasis was given to soil applied herbicides for grass control. Applications were made by a jeep-mounted sprayer on small plots or by helicopter on larger plots.  
Agents: Bromacil, Tandex, monuron, diuron, and fenuron  
DoD Involvement: Undetermined  

Georgia  
Location: Georgia and Tennessee  
Dates: 1964  
Project Description: In 1964, helicopter spray tests were conducted on transmission line rights-of-way by the Georgia Power Company and Tennessee Valley Authority in collaboration with Fort Detrick to evaluate effectiveness of several commercially available herbicides.  
Agents: Diquat and Tordon 101, various  
DoD Involvement: Yes  

Location: Fort Gordon, GA  
Project Description: During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI.  
Agents: In-house desiccants mixtures and formulations, Orange and Blue  
DoD Involvement: Yes  

Location: 2 areas in GA, 2 areas in FL, and 1 in TN  
Dates: 1968  
Project Description: In 1968, emphasis was given to soil applied herbicides for grass control. Applications were made by a jeep-mounted sprayer on small plots or by helicopter on larger plots.  
Agents: Bromacil, Tandex, monuron, diuron, and fenuron  
DoD Involvement: Undetermined  

Hawaii  
Location: Hilo, HI  
Dates: 12/1966  
Project Description: Field tests of defoliants were designed to evaluate such variables as rates, volume of application, season, and vegetation. Data from aerial application tests at several CONUS and OCONUS locations are provided in tables. There were Fort Detrick personnel there.  
Agents: Orange  
DoD Involvement: Yes  

Location: State Forest area, 3500 ft. elevation on slope of Mauna Loa, near Hilo, HI  
Project Description: The purpose of this project was to evaluate iso-octyl ester of picloram (TORDON) in mixtures with ORANGE, as a candidate defoliant agent, using ORANGE as standard. There were personnel from Fort Detrick there.  
Agents: Orange, M-3140, TORDON ester, 2,4-D ester, 2,4,5-T ester  
DoD Involvement: Undetermined  

Location: Kauai, HI  
Dates: 1967  
Project Description: Field tests of defoliants were designed to evaluate such variables as rates, volume of application, season, and vegetation. Data from aerial application tests at several CONUS and OCONUS locations are provided in tables.  
Agents: Orange  
DoD Involvement: Yes  

Location: Kauai Branch Station near Kapaa, Kawai, HI  
Project Description: During the period of 12/1966 - 10/1967, a comprehensive short-term evaluation was conducted by personnel from Fort Detrick's Plant Science Lab in coordination with contract research on formulations by chemical industry and field tests by USDA and U of HI.  
Agents: Blue, diquat, paraquat, Orange, PCP, Picloram, White, HCA, 2,4,5T, Endothall  
DoD Involvement: Yes  

Indiana  
Location: Vigo Plant CWS, Terre Haute, IN  
Dates: 5/1945 - 9/1945  
Project Description: Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was aerial trials spraying field grown plants.  
Agents: LN *phenoxy
DoD Involvement: Yes
Location: Jefferson Proving Grounds, Madison, IN
Dates: Summer 1945
Project Description: Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was dropping trials.
Agents: LN *phenox

Kansas
Location: Hays, KS; Langdon, ND
Dates: 1960
Project Description: Two studies on the stem rust of wheat were conducted during 1960 to obtain data on the establishment, development, and destructiveness of artificially induced stem rust epiphytotics.
Agents: Stem rust of wheat
DoD Involvement: Undetermined

Kentucky
Location: Fort Knox, KY
Dates: 1945
Project Description: In 1945, a special project known as Sphinx was conducted jointly by CWS and the ARML to investigate the use of chemical agents for increasing the flammability of vegetation prior to flame attack.
Agents: Various
DoD Involvement: Yes

Maryland
Location: Camp Detrick, MD - Fields A, B, and C
Dates: 1946-47
Project Description: The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots.
Agents: 2,4,5-T, 2,4,5-T triethanolamine, tributylphosphate, ethyl 2,4-D, butyl 2,4,5-Ttriet 2,4-D
DoD Involvement: Yes
Location: Camp Detrick, MD - Fields C, D, and E
Dates: 1948
Project Description: The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots.
Agents: 2,4,5-T, isopropyl phenol carbamate, LN-2426, 2,4-D
DoD Involvement: Yes
Location: Camp Detrick, MD - Fields C, D, and E
Dates: 1949
Project Description: The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were done by Ennis, DeRose, Newman, Williamson, DeRigo, and Thomas.
Agents: Triethelyne. 2,4,5-T, carbamates
DoD Involvement: Yes
Location: Camp Detrick, MD - Fields A, B, D, and E
Dates: 1950
Project Description: The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were done by Ennis, DeRose, Acker, Newman, Williamson, and Zimmerly.
Agents: 2464, butyl 2,4-D, 974, butyl 2,4,5-T, q:o 143 and 974
DoD Involvement: Yes
Location: Camp Detrick, MD - Field F
Dates: 1950-51
Project Description: The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were done by Acker, DeRose, McLane, Newman, Williamson, Baker, Dean, Johnson, Taylor, Walker, and Zimmerly.
Agents: 2464, carbamate, butyl 2,4-D, 143 and 974 (orange?),2,4,5-T, 2,4-D, Orange
DoD Involvement: Yes
Location: Area B, Camp Detrick, MD
Dates: Spring/Summer 1953
Project Description: Personnel at Camp Detrick tested the feasibility of using an experimental spray tower for applying a mixture of chemical anticrop agents to broad-leaf crops.
Agents: 3:1 mixture 2, 4-D and 2, 4, 5-T
### Texas

**Location:** Near San Antonio, TX

**Dates:** 1964

**Project Description:** While discussing the mandatory disposal of Orange, it was mentioned that 15,161 drums were being stored at San Antonio, Texas.

**Agents:** Orange

**DoD Involvement:** Yes

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### Oklahoma

**Location:** Chickasha, OK

**Dates:** 1968-70

**Project Description:** During the month of 1/1/1965, personnel from Naval Applied Science Laboratory in conjunction with personnel from Limited War Laboratory conducted a defoliation test along the shoreline.

**Agents:** Orange, Orange plus foam, Orange plus foam Orange, Foam

**DoD Involvement:** Yes

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### New Mexico

**Location:** San Ildefonso, NM

**Dates:** 1968-70

**Project Description:** While discussing the mandatory disposal of Orange, it was mentioned that 15,161 drums were being stored at San Ildefonso, New Mexico.

**Agents:** Orange

**DoD Involvement:** Yes

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### Utah

**Location:** Various locations in UT

**Dates:** 1968-70

**Project Description:** Various studies were done to explore the effectiveness of different herbicides. They were all field trials. These studies were done by personnel from the US Army Biological Laboratories.

**Agents:** Various, 577 compounds

**DoD Involvement:** Yes

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### Canada

**Location:** Various locations in CA

**Dates:** 1968-70

**Project Description:** Various studies were done to explore the effectiveness of different herbicides. They were all field trials. These studies were done by personnel from the US Army Biological Laboratories.

**Agents:** Various, 577 compounds

**DoD Involvement:** Yes

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### Virginia

**Location:** Various locations in VA

**Dates:** 1968-70

**Project Description:** Various studies were done to explore the effectiveness of different herbicides. They were all field trials. These studies were done by personnel from the US Army Biological Laboratories.

**Agents:** Various, 577 compounds

**DoD Involvement:** Yes

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### None of the above

**Location:** Various locations

**Dates:** 1968-70

**Project Description:** Various studies were done to explore the effectiveness of different herbicides. They were all field trials. These studies were done by personnel from the US Army Biological Laboratories.

**Agents:** Various, 577 compounds

**DoD Involvement:** Yes

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Fort Drum, NY
Location: Fort Drum, NY
Dates: 1959
Project Description: The Commanding General, 1st US Army, requested that Fort Detrick assist with defoliation efforts at Fort Drum. Thirteen drums were sprayed there on 4 square miles from a helicopter spray device.
Agents: Orange
DoD Involvement: Yes

North Dakota
Location: Langdon, ND; Hays, KS
Dates: 1960
Project Description: Two studies on the stem rust of wheat were conducted during 1960 to obtain data on the establishment, development, and destructiveness of artificially induced stem rust epiphytotics.
Agents: Stem rust of wheat
DoD Involvement: Undetermined

Pennsylvania
Location: Stone Valley Experimental Forest in Huntington County and near State College in Centre County, PA
Project Description: Soil-applied herbicides were studied by the U of PA with Ft Detrick for 18 months for their effectiveness, rapidity of action, and duration of response in native stands of central PA grasses, broadleaf weeds and woody plants. These herbicides were spread or sprayed.
Agents: Bromacil, diuron, tandex, fenuron, picloram
DoD Involvement: Undetermined

Rhode Island
Location: Kingston, RI
Dates: 7/26/1949, 1950-51
Project Description: The experiments were directed mainly towards the investigation of plant inhibitors applied as sprays or to the soil in the solid form to be taken up by the roots. Experiments were carried out under supervision of T.E. Odland if RI State College. H.T. DeRigo was also there.
Agents: Trieth.2,4,5-T, butyl 2,4,5-T,974
DoD Involvement: Yes

Tennessee
Location: Tennessee and Georgia
Dates: 1964
Project Description: In 1964, helicopter spray tests were conducted on transmission line rights-of-way by the Georgia Power Company and Tennessee Valley Authority in collaboration with Fort Detrick to evaluate effectiveness of several commercially available herbicides.
Agents: Diquat and Tordon 101, various
DoD Involvement: Yes

Texas
Location: Beaumont, TX
Dates: 6/1944
Project Description: Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, they were testing on rice crops.
Agents: LN *phenoxy
DoD Involvement: No

Location: Beaumont, TX
Dates: 1950-51
Project Description: The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Here, irrigation water studies were
done with the agent. Coghill, Hasse, and Yeatner worked here.

**Agents:** 2,4-D  
**DoD Involvement:** Undetermined

**Location:** Weslaco, TX  
**Dates:** 5/1967 - 1/1969  
**Project Description:** 71 new arsenic compounds were tested in primary screening against 6 plant species in greenhouse tests. Then, 5 of the most active compounds were tested in field trials against Red Maple and compared to formulations of cacodylic acid and a 50:50 blend of orange and sodium cacodylate. The Ansul Co. for DoD.

**Agents:** Arsenic compounds, Orange, cacodylic acid, sodium cacodylate  
**DoD Involvement:** Yes

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**Utah**

**Location:** Granite Peak, UT  
**Dates:** Summer 1945  
**Project Description:** Small plot experiments were commenced to test the effectiveness of LN agents. Various trials were done under contract with the USDA, aided by personnel at Camp Detrick. Here, it was dropping trials.

**Agents:** LN *phenoxy*  
**DoD Involvement:** Yes

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**Washington**

**Location:** Prosser, WA  
**Dates:** 1950-51  
**Project Description:** The purpose was to determine means of accomplishing defoliation of tropical forest vegetation by application of a chemical agent. Here, irrigation water studies were done with the agent. V.F. Burns worked here.

**Agents:** 2,4-D  
**DoD Involvement:** Undetermined

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**Wisconsin**

**Location:** Marinette, WI  
**Dates:** 5/1967 - 1/1969  
**Project Description:** 71 new arsenic compounds were tested in primary screening against 6 plant species in greenhouse tests. Then, 5 of the most active compounds were tested in field trials against Red Maple and compared to formulations of cacodylic acid and a 50:50 blend of orange and sodium cacodylate. The Ansul Co. for DoD.

**Agents:** Arsenic compounds, Orange, cacodylic acid, sodium cacodylate  
**DoD Involvement:** Yes

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