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# Point Paper on Agent Orange Guam

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4-19-2011

Sirs,

Here is a manual from the Alvin Young collection, produced by the Department of Agriculture and the University of Maryland, on how to properly use the rainbow herbicides.

1. Farmers Bulletin No. 2183, U.S. DEPARTMENT OF AGRICULTURE & the University of Maryland. The facts are these herbicides were the industry standard for that time for vegetation control. The DoD denies the rainbow herbicides were used on Guam, so where is their evidence of some other herbicide being used on Guam?
2. This “user’s manual” was printed in May 1962 and revised in January 1971 after I was exposed in Guam. So in 1969 – 1970 we were not doing anything unusual or illegal by using these herbicides. As you can see these herbicides were the “standard” for that time. The reason why these two herbicides were mixed was 2-4-D was more effective on some weeds and the 2-4-5-T was more effective on other weeds. (2-4-D and 2-4-5-T is Agent Orange)
3. These herbicides were approved for use by the Department of Agriculture and the University of Maryland for farming and vegetation control. Now the DoD states that there are no records showing the use of these herbicides on Guam and at the same time there is testing for them in the well water and they are being found (see page 29). It must be “magic” how they got there.
4. The DoD states they don’t have any records of the rainbow herbicides being on Guam while denying the pictures and eye witness testimony from the people handling the drums of the rainbow herbicides. Then the VA approves the claims for the eye witnesses and the VA turns my claim down without even looking at the evidence.
5. At what point does the “Reasonable Doubt” regulation (38 CFR 3.102) kick in? The Government has no evidence and the Veterans have a mountain of evidence. If that doesn’t meet or exceed the standards for the Reasonable Doubt regulation, I can’t imagine what would.

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Contents: Point Paper about Agent Orange on Guam.....	Pages 1
Contents: Location Where the User Manual was Found.....	Pages 2-4
Contents: User’s Manual for the Rainbow Herbicides.....	Pages 5-28
Contents: Well Water Data Report Showing Herbicides in Well Water .....	Pages 29
Contents: Robert Burgett VA Case Approved for Agent Orange On Guam.....	Pages 30-32
Contents: Robert Burgett Statement with Photo Descriptions & Photos.....	Pages 33-35
Contents: Robert Burgett Additional Letter.....	Pages 36
Contents: Roger Richmond Statement about Agent Orange on Guam.....	Pages 37
Contents: Jimmy Dale Young Statement about Agent Orange on Guam.....	Pages 38
Contents: 38 CFR 3.102 Reasonable Doubt Regulation.....	Pages 39

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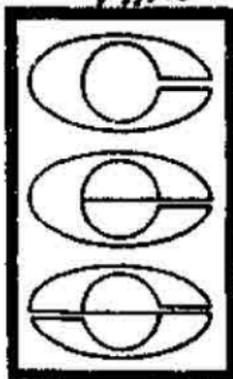
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**Description Notes**

J.R. ... Another Lazeris ... see mugwort ✓



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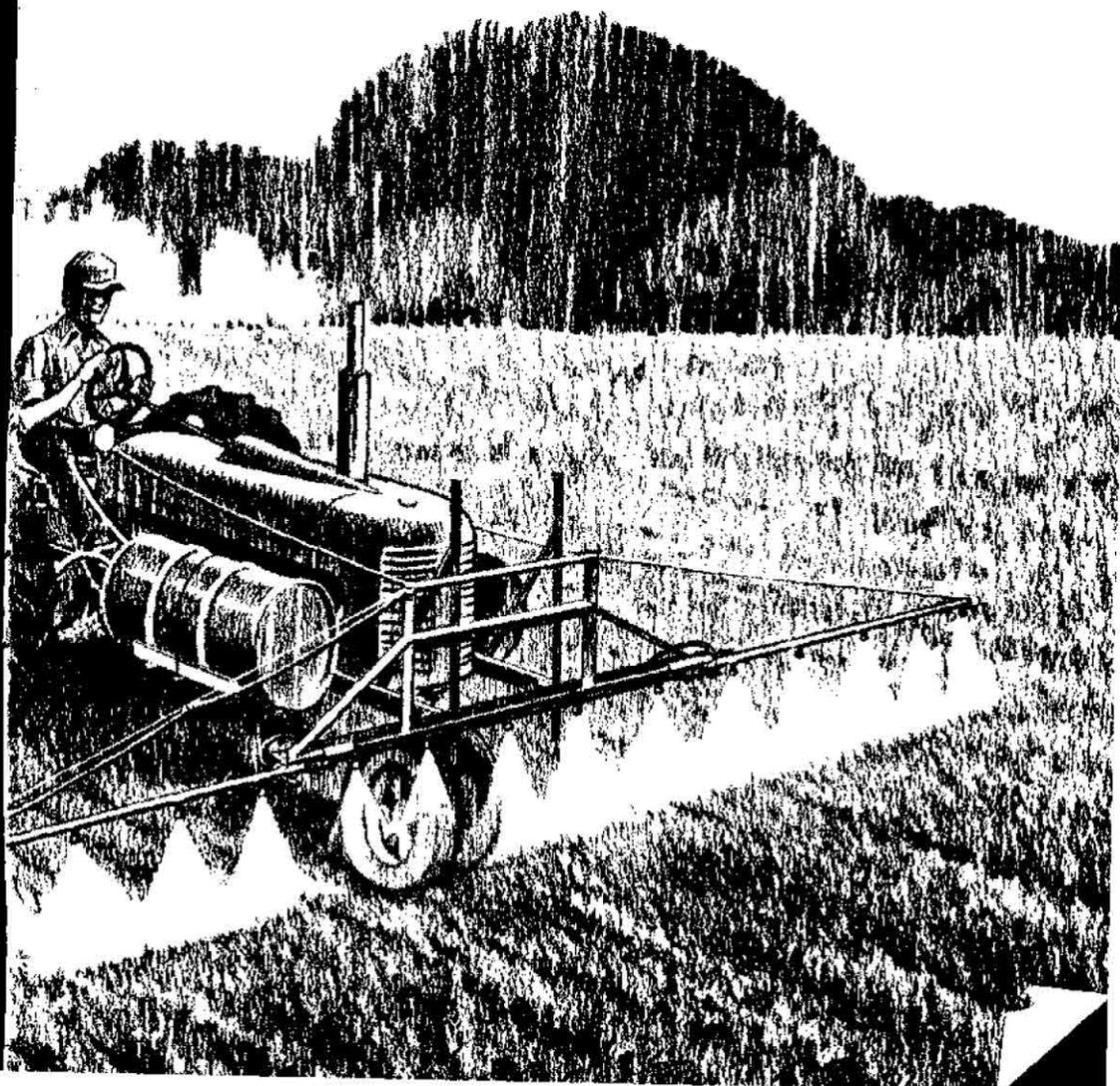
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# USING PHENOXY HERBICIDES EFFECTIVELY



# COMMON AND CHEMICAL NAMES OF PHENOXY HERBICIDES <sup>A</sup>

<i>Common name</i>	<i>Chemical name</i>
2,4-D .....	2,4-dichlorophenoxyacetic acid
2,4,5-T .....	2,4,5-trichlorophenoxyacetic acid
Silvex .....	2-(2,4,5-trichlorophenoxy)propionic acid
MCPA .....	2-methyl-4-chlorophenoxyacetic acid
2,4-DB .....	4-(2,4-dichlorophenoxy)butyric acid

The U.S. Department of Agriculture has suspended the use of liquid formulations of 2,4,5-T around the home and of all formulations on lakes, ponds, and ditchbanks. Also, the Department has cancelled use of all formulations of 2,4,5-T on food crops and of dry formulations around the home. 2,4,5-T should not be used in any of the above situations, and inclusion of 2,4,5-T in this publication does not suggest such uses.

## CONTENTS

	Page
How plants react .....	3
Salts and esters .....	3
"Acid equivalent" .....	5
Application .....	5
General principles .....	5
Methods .....	6
Testing output of sprayer .....	8
Cleaning spray equipment .....	10
Susceptibility chart .....	11



*Use Pesticides Safely*  
FOLLOW THE LABEL

U.S. DEPARTMENT OF AGRICULTURE

***This bulletin supersedes Farmers' Bulletin 2005, "Using 2,4-D Safely."***

Washington, D.C.

*Issued May 1962  
Revised January 1971*

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# USING PHENOXY HERBICIDES EFFECTIVELY

## 2,4-D, 2,4,5-T, MCPA, Silvex, 2,4-DB

By D. L. Klingman and W. C. Shaw, Crops Research Division,  
Agricultural Research Service

Phenoxy herbicides—chiefly 2,4-D, 2,4,5-T,<sup>1</sup> silvex, MCPA, and 2,4-DB—are used widely. They are used for controlling weeds in many crops, on grazing lands, on lawns, and for killing unwanted brush and trees. These herbicides are especially useful because—

- They are selective; they kill most broadleaf plants but do not kill grasses or grain crops.
- They are potent; many species of weeds are controlled by less than 1 pound of active ingredient per acre.
- They are easy to use.
- They are not poisonous to man, domestic animals, or game when applied at the recommended rates.
- They do not accumulate in the soil and they have no harmful effects on soil organisms.
- They are not corrosive to spraying equipment.

### HOW PLANTS REACT

When sprayed with phenoxy herbicides, leaves, green stems, twigs, flowers, and fruits usually absorb the herbicides. Roots absorb herbicides sprayed on the soil.

<sup>1</sup> See limitation on use of 2,4,5-T on page 2.

When they are applied to growing plants or to the soil, herbicides rapidly become distributed in the leaves, stems, and roots and cause susceptible plants to die.

These herbicides are absorbed most readily by plants that are growing rapidly. Annual weeds are easiest to kill when they are young. Perennial weeds are easy to kill while they are seedlings; after they are established, most perennials are easiest to kill at the time flower buds appear.

Some broadleaf weeds are killed by very small amounts of phenoxy herbicides. Some are almost unaffected by very large amounts.

The chart on pages 12 to 24 lists the susceptibility of many common weeds and woody plants to control by 2,4-D, 2,4,5-T,<sup>1</sup> MCPA, silvex, and 2,4-DB.

### SALTS AND ESTERS

Phenoxy herbicides are usually formulated as acids, salts, and esters. Salt and ester formulations usually are supplied as liquid concentrates. The purchaser mixes them before use. The salt concentrates form solutions when mixed with water. The ester concentrates form solutions when mixed with oil; they form milky-white

emulsions when mixed with water.

Heat causes ester formulations to release vapors. At temperatures below 90° F., low-volatile esters are much less volatile than high-volatile esters, and are less likely to damage susceptible crops. Vapors from either low- or high-volatile esters are about equally phytotoxic at temperatures above 90° F.

*Vapors from ester formulations can kill susceptible plants growing near the area to which the formulations are applied.* Low-volatile esters are safer—that is, less likely to harm susceptible crops by toxic vapors—than high-volatile esters. Salt formulations are safest—they do not release enough vapors to cause damage.

High-volatile esters are less expensive than low-volatile esters and

they can be used effectively and safely if no susceptible crops are growing nearby.

Ester formulations of the phenoxy herbicides are generally more potent, pound for pound, than salts. They penetrate leaves and other plant surfaces more readily than salts. When a range of rates is recommended for herbicide application, use the lower rate for esters and the higher rate for salts.

Esters are more effective than salts for killing weeds that are growing slowly because of drought or cold weather. Esters usually are best for treating weeds in areas of low humidity; esters are formulated in oils and remain in moist contact on foliage longer and penetrate better than salts, which are mixed with water. And, because



BN-13721-X

Weeds in this field of small grain (treated part at right) were controlled with 2,4-D. The herbicide costs about 25 cents per acre.

they are oily, esters are less likely than salts to be washed off foliage if rain falls soon after their application.

## "ACID EQUIVALENT"

Phenoxy herbicide concentrates are available in various strengths. The amount of active ingredient in the concentrate is indicated on the container label as the number of pounds of "acid equivalent" in each gallon of concentrate.

Usually the strongest concentrates are the most economical to use; they usually cost less per pound of acid equivalent than weaker concentrates. For example, 1 gallon of a 2,4-D concentrate containing 4 pounds of acid equivalent per gallon usually will cost less than 4 gallons of concentrate containing 1 pound of acid equivalent per gallon, and it contains the same amount of active ingredient.

## APPLICATION

### General Principles

If herbicides are applied carefully they can save you money and labor. If they are applied carelessly, they can kill your crops.

Some crops and ornamental plants are extremely sensitive to phenoxy herbicides; they are severely injured or killed by small traces of the herbicides, such as spray drift or vapors.

The most sensitive of the crops and ornamental plants include cotton, grapes, tomatoes, cucumbers, tobacco, mimosa, roses, and dogwood. For more information

about sensitivity of your crops to phenoxy herbicides, ask your county agricultural agent.

When using phenoxy herbicides near sensitive plants, observe all precautions regarding vapors, spray drift, and cleanliness of equipment.

For safe and effective control of weeds—

- Get professional advice before applying herbicides; ask your county agricultural agent, your State extension weed specialist, or other local agricultural authorities for weed-control recommendations.
- Use herbicides wisely: Follow label precautions. Do not apply herbicides for any use for which they are not registered.
- Avoid spraying on windy days.

---

### *Types of Phenoxy Herbicides Commonly Available*

#### **SALTS, such as:**

Amine (triethanolamine, diethanolamine, trimethylamine, diethylamine, and isopropanolamine.

Sodium

Potassium

Ammonium

#### **ESTERS**

##### *High-Volatile, such as:*

Methyl

Ethyl

Isopropyl

Butyl

Amyl

##### *Low-Volatile, such as:*

Butoxyethanol

Butoxyethoxypropanol

Ethoxyethoxypropanol

Isocetyl

Propylene glycol butyl ether

- Do not apply ester formulations when the temperature is above 90°.
- Check output of your sprayer frequently to prevent over application of herbicides.
- Avoid sprayer skips or overlapping swaths.
- Clean spray equipment immediately after use.
- Before using spray equipment for applying insecticides or fungicides to crops, test it for injurious traces of herbicides.

## Methods

### *Cropland*

You can apply herbicides on cropland as preemergence sprays (after the crop is planted but before it or the weeds come up) or as postemergence sprays (after the crop and weeds come up).

Most modern spray equipment is designed for low-volume application—from about 5 to about 20 gallons of spray per acre. With the



BN-13660-X

Cotton is extremely susceptible to phenoxy herbicides. This plant was killed when it was accidentally sprayed with 2,4-D.

proper attachments, low-volume equipment can be used for broadcast spraying, band treatments, or directed spraying.

Apply a broadcast spray if the crop plants are not sensitive to the herbicide.

For broadcast application, the spray rig is equipped with a multiple-nozzle boom or a single boomless nozzle.

Apply a directed spray if the crop plants are somewhat sensitive to the herbicide.

For directed application, the rig is equipped with a boom and drop nozzles, which are adjusted to spray the weeds but no more than the bases of the crop plants.

Airplanes often are used for spraying nonrow crops, such as small grains and rice.

### ***Noncropland***

Use a ground sprayer with boom to apply low-volume broadcast spray for the control of weeds, brush, and trees on grazing land and along irrigation canals.

Airplanes often are used for applying low-volume broadcast sprays to noncropland areas that are too large, too rough, or have too many obstructions for ground equipment.

Apply high-volume directed spray to kill brush and trees along roads, utility lines, and fencerows, and aquatic weeds and brush along irrigation and drainage canals.

Equipment for high-volume spraying usually has a large-capacity spray tank (over 100 gallons per acre of spray may be used) and operates at relatively

high pressure (about 60 to 100 pounds per square inch). The rig usually is equipped with a spray hose and adjustable nozzle. The spray often is applied as a drench that thoroughly wets the leaves and stems of the plants that are to be killed.

Apply sprays of ester formulations in diesel oil or kerosene to the bark at the base of small trees or to cuts in the bark at the base of large trees.

Phenoxy ester formulations with oil as a carrier can be absorbed by the bark at the base of trees with trunk diameters up to about 4

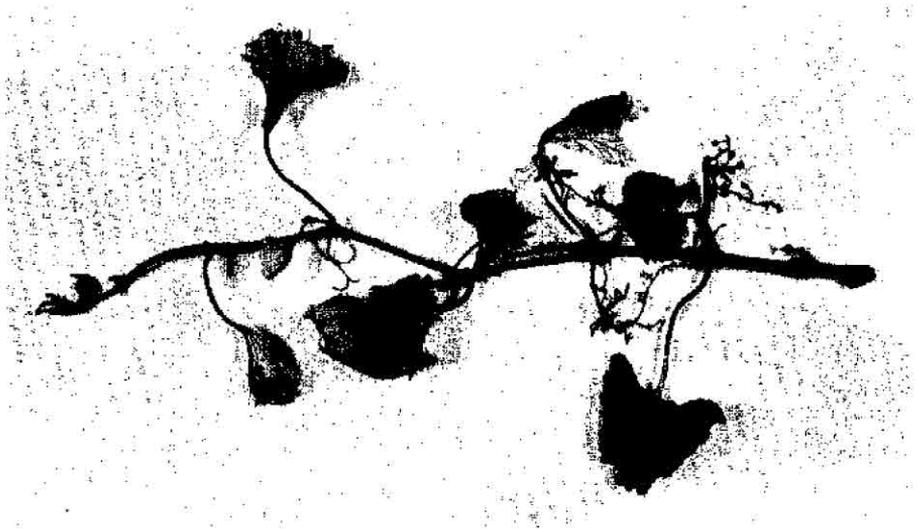
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### ***Spray Drift***

Wind-carried droplets of phenoxy herbicides may kill susceptible crops near the area that is being treated.

To reduce the danger of damaging crops with spray drift—

- Use nozzles that apply a coarse spray.
- Use low pressures—no more than 35 pounds per square inch for boom sprayers, 100 pounds for spray guns.
- Avoid spraying on windy days; do not spray with ground equipment or from airplanes when the wind velocity is sufficient to cause drift to sensitive crops.
- Spray when wind is blowing away from susceptible crops and toward the area being sprayed.
- Where special drift hazards exist, use one of the special drift-control agents or formulations in properly designed and adjusted equipment. Get professional advice before using these.



#N-13679-X

Spray drift from a nearby application of phenoxy herbicide severely injured this Concord grape vine.

inches. The spray usually is applied with a small hand-operated sprayer and the lower 6 to 12 inches of bark on the trunk is thoroughly wetted with the solution.

The bark of many trees that are over 4 inches in diameter is too thick for the spray to penetrate. To kill these larger trees, it is necessary to ring the base of the tree with ax cuts and spray the ester solution into the cuts. The ax cuts must go through the bark and into the sapwood.

### TESTING OUTPUT OF SPRAYER

Before mixing or applying herbicides on cropland, check the output of your spray equipment. If you apply too little herbicide, it is ineffective. If you apply too much, it may kill your crops.

In the test, the tractor speed and the pump pressure should be the same as they will be when you apply herbicide. If your tractor is not equipped with a speedometer, it is a good idea to make the test on the same type of terrain that you plan to spray and to mark the throttle setting that you use.

To test the output—

- Fill the spray tank with water.
- Spray a strip exactly 220 yards long.
- At the end of 220 yards, stop spraying and measure, in quarts, the amount of water needed to refill the spray tank.

To determine the spray output in gallons per acre, multiply the number of quarts by 16.5 and divide the answer by the width, in feet, of the spray strip.

Example: Your spray rig treats a strip 20 feet wide. At operating



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The equipment used to apply insecticide to this tobacco plant had been used previously for applying phenoxy herbicide. The tobacco was injured by herbicide traces that remained in the sprayer.

speed and pressure, the rig uses 6 quarts of water in 220 yards:

$$6 \times 16.5 = 99.$$

$99 \div 20 = 4.95$ , or about 5 gallons of spray per acre.

The output of the sprayer is for the area treated. If your sprayer is adjusted to apply spray in bands to row crops, calculate the total width of the spray pattern. To do this, multiply the number of nozzles by the width that each nozzle treats.

If you are using 6 drop nozzles and each treats a 20-inch width, then the total width of the spray

pattern is 10 feet, regardless of the nozzle spacing.

Output of the spray equipment may change because of enlarged nozzle orifices or worn parts in the pump. Check the output periodically to prevent application at the wrong rate.

After you know the output of your sprayer, you can mix the spray accurately. To calculate the total amount of spray needed, multiply the area to be sprayed, in acres, by the output per acre. Add the recommended amount of acid equivalent—in the form of herbicide

concentrate—to enough carrier (water or oil) to equal the total amount of spray needed.

For example: The calculated output is 5 gallons per acre and you plan to spray 10 acres at a recommended rate of 1 pound of acid equivalent per acre. Therefore you will need a total of 50 gallons of spray containing 10 pounds of acid equivalent.

The herbicide concentrate contains 4 pounds of acid equivalent per gallon. Add 2½ gallons of concentrate (10 pounds total acid equivalent) to 47½ gallons of water.

### CLEANING SPRAY EQUIPMENT

Clean your spray equipment immediately after using it for applying herbicides.

Some crops can be damaged or killed by traces of phenoxy herbi-

cides that are left in the sprayer after cleaning. Before applying fungicides or insecticides to crops with equipment that has been used for herbicides, test the equipment for herbicide traces.

Fill the tank with water and spray a few of the crop plants. Sensitive plants such as tomato, cotton, and tobacco are good test plants. Wait a day or two after spraying. If the crop plants show no distorted growth after this period, the equipment can be used safely for spraying the crop. If the plants are distorted, then clean the spray equipment again. Re-test the equipment for cleanliness before using it on crops.

For greatest safety with sensitive crops, apply fungicides or insecticides with equipment that has not been used for applying herbicides.

You can clean spray equipment quickly with a suspension of acti-



BN-11740-X

The right half of this field was sprayed with 2,4-D before the corn or weeds emerged. The left half of the field was not treated.

## PRECAUTIONS

Phenoxy herbicides are safe when stored, handled, mixed, and used in accordance with label instructions and sound agricultural practices. Most herbicides are low in toxicity. However, some can cause injury to man, many domestic animals, and fish and wildlife if improperly used.

Most herbicides are toxic to many crop plants and ornamentals. Many are volatile and their vapors and spray drift will cause damage to desirable plants. Avoid spraying when windy conditions exist.

Keep herbicides away from children, livestock, and pets. Store herbicides in closed, well-labeled containers in a dry place where they cannot contaminate food, feed, or water.

When handling herbicides wear clean, dry clothing. Launder clothing after each spraying operation before wearing again.

Do not inhale herbicides and avoid contact with spray mist and drift. Avoid repeated or prolonged contact of herbicide with your skin. Avoid spilling it on any part of your body—especially your eyes, nose, and mouth. If you spill it on your body, wash it off with soap and water and remove contaminated clothing.

To protect fish, wildlife, and livestock, do not clean spraying equipment or dump excess spray material near lakes, streams, or ponds.

Empty herbicide containers may be hazardous. Dispose of them in accordance with label instructions and the recommendations of your State Extension weed science specialist or other local agricultural authorities. Do not burn herbicide containers.

vated charcoal in water. Use at least one-third of a tank of water. For each 10 gallons of water add  $\frac{1}{4}$  pound of activated charcoal and  $\frac{1}{8}$  to  $\frac{1}{4}$  pound of laundry detergent. Agitate this mixture vigorously to distribute the charcoal through the water.

Wash the equipment for 2 minutes by swirling the liquid around in the tank so that it reaches all parts of the tank. Pump some of the liquid through the hose and nozzles. Then drain the tank and rinse the equipment with clean water.

## SUSCEPTIBILITY CHART

The chart that follows lists the effects of phenoxy herbicides when

applied as foliage sprays on a number of common weeds. Normal rate of application for 2,4-D, 2,4,5-T,<sup>1</sup> MCPA, or silvex is 1 pound per acre; normal rate of application for 2,4-DB is 2 pounds per acre.

The control ratings for the herbicides are interpreted as follows:

Excellent.—One application at normal rate kills the weed.

Good.—Several applications at normal rate needed to kill the weed.

Fair.—Repeated applications at normal rate or application at higher rates needed to kill the weed.

Poor.—Weed kill is erratic, even at high rates of application.

<sup>1</sup> See limitation on use of 2,4,5-T on page 2.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Alder ( <i>Alnus</i> spp.)	Woody	Good	Good	Excellent	Excellent	
Alligatorweed ( <i>Alternanthera philoxeroides</i> )	Perennial	Poor	None	Fair	Fair	
Alyssum, hoary ( <i>Berteroa incana</i> )	Perennial <sup>3</sup>	Fair	Fair	Excellent		Poor.
Amaranth:						
Green ( <i>Amaranthus hybridus</i> )	Annual	Excellent	Excellent	do		Excellent.
Palmer ( <i>A. palmeri</i> )	do	do	do	do	Excellent	
See also Pigweed.						
Arrowgrass, seaside ( <i>Triglochin maritima</i> )	Perennial	Fair		Fair		
Arrowhead:						
Annual ( <i>Sagittaria calycina</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Do.
Perennial ( <i>S. longiloba</i> )	Perennial	Fair	Fair	Poor		
Ash ( <i>Fraxinus</i> spp.)	Woody	None	None	do	Poor	None.
Aster:						
Many-flowered ( <i>Aster ericoides</i> )	Perennial	Good				
Western ( <i>A. occidentalis</i> )	do	Poor		Poor		Do.
White heath ( <i>A. pilosus</i> )	do	Fair		Fair	Fair	Do.
Woody ( <i>Xylorrhiza parryi</i> )	do	Poor	None	Poor	Poor	
Baccharis, coyote brush ( <i>Baccharis salicina</i> )	Woody	Excellent				
Baileya, desert ( <i>Baileya multiradiata</i> )	Perennial	Good		Good		
Bassia, five-hook ( <i>Bassia hyssopifolia</i> )	Annual	Fair				
Cornflower:						
Batchelor's button ( <i>Centaurea cyanus</i> )	do	Excellent				
Bedstraw:						
Cleavers ( <i>Gallium aparine</i> )	do	Poor	None	Poor	Good	Do.
Smooth ( <i>G. mollugo</i> )	Perennial	None	do	do	do	Do.
Beeplant, Rocky Mountain ( <i>Cleome serrulata</i> )	Annual	Fair				
Beggartick, devils ( <i>Bidens frondosa</i> )	do	Excellent	Excellent	Excellent		
Florida betony ( <i>Stachys floridana</i> )	Perennial	Poor		Poor		
Bindweed:						
Field ( <i>Convolvulus arvensis</i> )	do	Fair	Fair	Fair	Fair	Fair.
Hedge ( <i>C. sepium</i> )	do	Good	Good	Good		
Biscuitroot ( <i>Lomatium leptocarpum</i> )	do	Fair		do		
Bistort, American ( <i>Polygonum bistortoides</i> )	do	do		Fair		None.
Blackberry ( <i>Rubus</i> spp.)	Woody	None	None	Good	Fair	Do.

Blackeyed susan ( <i>Rudbeckia serotina</i> )	Perennial	Good		do	Excellent	
Bloodweed ( <i>Ambrosia aptera</i> )	Annual	Excellent		Excellent		
Blueweed, Texas ( <i>Helianthus ciliaris</i> )	Perennial	Fair				
Bouncingbet ( <i>Saponaria officinalis</i> )	do	Poor	None	Poor	Poor	Do.
Boxelder ( <i>Acer negundo</i> )	Woody	Good		Good	Good	
Bracken ( <i>Pteridium aquilinum</i> )	Perennial	None	None	None	None	Do.
Broomweed, common ( <i>Gutierrezia dracunculoides</i> )	Annual	Good		Good	Good	
Broom, Scotch ( <i>Cytisus scoparius</i> )	Woody	do		do		
Buckeye, California ( <i>Aesculus californica</i> )	do	Fair		Poor	None	
Buckwheat:						
Tartary ( <i>Fagopyrum tataricum</i> )	Annual	Poor	Excellent	Fair		
Wild ( <i>F. convolvulus</i> )	do	Fair	Fair	Good	Fair	Good.
Buffalobur ( <i>Solanum rostratum</i> )	do	None	None	None		
Bulrush ( <i>Scirpus</i> spp.)	Perennial	Fair	Fair	Fair	Fair	None.
Burdock, common ( <i>Arctium minus</i> )	Biennial	Excellent	Excellent	Excellent	Excellent	Excellent.
Bur-head ( <i>Echinodorus cordifolius</i> )	Annual	do	do	do	do	
Buckbrush ( <i>Symphoricarpos orbiculatus</i> )	Woody	Good		Fair	None	
Western ( <i>S. occidentalis</i> )	do	Fair	None	Poor		
Bullnettle ( <i>Cnidocolus stimulosus</i> )	Perennial	Good	Fair	Good		
Burweed ( <i>Haplopappus tenuisectus</i> )	do	do		Excellent		
Buttercup:						
Celery leaf ( <i>Ranunculus sceleratus</i> )	Annual	Fair				
Corn ( <i>R. arvensis</i> )	do	Good	Excellent	Excellent	Excellent	Excellent.
Creeping ( <i>R. repens</i> )	Perennial	do	do	do	do	Good.
Tall ( <i>R. acris</i> )	do	do	do	do	do	Excellent.
Campion, bladder ( <i>Silene cucubalus</i> )	do	None	None	None	None	None.
Carpetweed ( <i>Mollugo verticillata</i> )	Annual	Excellent		do	do	Excellent.
Carrot, wild ( <i>Daucus carota</i> )	Biennial	Fair	Fair	Fair	Fair	Fair.
Catchfly, night flowering ( <i>Silene noctiflora</i> )	Annual	None	None	None	None	None.
Catsear, spotted ( <i>Hypochaeris radicata</i> )	Perennial	Good	Excellent	Excellent	Excellent	Excellent.
Catnip ( <i>Nepeta cataria</i> )	do	do		do		
Cattail:						
Broadleaf ( <i>Typha latifolia</i> )	do	Fair	Poor	Fair	Fair	Poor.
Narrowleaf ( <i>T. angustifolia</i> )	do	do	do	do	do	Do.
Ceanothus ( <i>Ceanothus</i> spp.)	Woody	do	Fair	Good		Fair.
Wedgeleaf ( <i>C. cuneatus</i> )	do	Good	do	Excellent		
Chamise ( <i>Adenostoma fasciculatum</i> )	do	Fair	Poor	Fair	Poor	Poor.
Chickweed:						
Common ( <i>Stellaria media</i> )	Annual	do	do	Good	Excellent	Fair.
Field ( <i>Cerastium arvense</i> )	Perennial	do	do	do	do	Poor.
Mouseear ( <i>C. vulgatum</i> )	do	do	do	do	do	Do.

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Chicory ( <i>Cichorium intybus</i> )	Perennial	Good	Good	Good	Good	Fair.
Chockcherry ( <i>Prunus virginiana</i> )	Woody	Poor		Fair	Fair	None.
Cinquefoil:						
Blueleaf ( <i>Potentilla diversifolia</i> )	Perennial	Fair		do		Do.
Common ( <i>P. canadensis</i> )	do	Good	Fair	do	Fair	
Rough ( <i>P. norvegica</i> )	Annual <sup>3</sup>	Excellent				
Sulfur ( <i>P. recta</i> )	Perennial	Good	Fair	Good	Fair	
Cockle:						
Corn ( <i>Agrostemma githago</i> )	Annual <sup>3</sup>	Poor	Poor	None	None	None.
White ( <i>Lychnis alba</i> )	Perennial	do	None	do		Do.
Cocklebur, common ( <i>Xanthium pensylvanicum</i> )	Annual	Excellent	Fair	Excellent		Good.
Coffeeweed ( <i>Daubentonia texana</i> )	Woody	do		do	Good	
Coyote brush ( <i>Baccharis pilularis</i> )	do	Good		Fair		
Coyotillo ( <i>Karwinskia humboldtiana</i> )	Perennial			Excellent	Excellent	
Cranebill, cutleaf ( <i>Geranium dissectum</i> )	Annual <sup>3</sup>		Excellent			
Cress, hoary ( <i>Cardaria draba</i> )	Perennial	Fair	Fair	Fair	Fair	Fair.
Croton:						
Lindheimer ( <i>Croton lindheimeri</i> )	Annual	Excellent	Excellent	Good	Good	Good.
Texas ( <i>C. texensis</i> )	do	do		Excellent	Excellent	
Wolly ( <i>C. capitatus</i> )	do	do		do	do	Excellent.
Cucurbit ( <i>Sicyos angulatus</i> )	do	Fair	Excellent			
Cudweed ( <i>Gnaphalium peregrinum</i> )	Annual	None				
Daisy, oxeye ( <i>Chrysanthemum leucanthemum</i> )	Perennial	Fair	Fair	Good	Fair	None.
Dandelion ( <i>Taraxacum officinale</i> )	do	Excellent	Excellent	Excellent	Excellent	Good.
Deadnettle, red ( <i>Lamium purpureum</i> )	Annual <sup>3</sup>	Poor	Poor			Poor.
Deathcamas ( <i>Zigadenus gramineus</i> )	Perennial	Fair		Poor		
Foothill ( <i>Z. paniculatus</i> )	do	Good		Fair		
Deerweed ( <i>Lotus scoparius</i> )	Woody	Excellent		Excellent		
Devil's claw ( <i>Proboscidea louisianica</i> )	Annual	do				

Dock:							
Broadleaf ( <i>Rumex obtusifolius</i> )	Perennial	Good	Fair	Good	Good	Fair	
Curly ( <i>R. crispus</i> )	do	do	do	do	Poor	Fair	
Fiddle ( <i>R. pulcher</i> )	do	Excellent					
Pale ( <i>R. altissimus</i> )	do	Good	Good	Good	Good	Poor	
Veiny ( <i>R. venosus</i> )	do	Fair					
Dodder:							
Largeseed ( <i>Cuscuta indecora</i> )	Annual	Poor	None	None	None	None	
Smallseed alfalfa ( <i>C. pentagona</i> )	do	do	do	do	do	Do	
Duckweed, common ( <i>Lemna minor</i> )	do	do		do	None		
Elm ( <i>Ulmus</i> spp.)	Woody	do	None	Fair	Fair	Do	
Eveningprimrose, common ( <i>Oenothera biennis</i> )	Biennial	Excellent		Good	Excellent		
Falseflax, smallseeded ( <i>Camelina microcarpa</i> )	Annual	do					
Fennel, dog ( <i>Eupatorium capillifolium</i> )	do	Good		Excellent	Excellent	Do	
Fiddleneck, coast ( <i>Amsinckia intermedia</i> )	do	do	Fair	Good	do	Do	
Filaree, redstem ( <i>Erodium cicutarium</i> )	Annual <sup>2</sup>	Good				Poor	
Fireweed ( <i>Epilobium angustifolium</i> )	Perennial	do		Good	Excellent		
Fleabane:							
Annual ( <i>Erigeron annuus</i> )	Annual	Fair	Fair	do	do	Excellent	
Oregon ( <i>E. speciosus</i> )	Perennial	do					
Rough ( <i>E. strigosus</i> )	Annual <sup>2</sup>	Good		Excellent	Excellent		
Flixweed ( <i>Descurainia sophia</i> )	do	Excellent	Fair			Good	
Franseria:							
Bur ( <i>Franseria discolor</i> )	Perennial	Fair					
Woollyleaf ( <i>F. tomentosa</i> )	do	do	Poor	Poor	Poor	Poor	
Galinsoga, hairy ( <i>Galinsoga ciliata</i> )	Annual	Good	Excellent	Excellent	Excellent		
Garlic, wild ( <i>Allium vineale</i> )	Perennial	Fair	Poor	Poor	None	Do	
Geranium, Carolina ( <i>Geranium carolinianum</i> )	Annual <sup>2</sup>	Good	Excellent	Good	Good	Excellent	
Goatsrue ( <i>Galega officinalis</i> )	Perennial	Fair					
Goldenrod ( <i>Solidago</i> spp.)	do	do					
Gooseberry, sierra ( <i>Ribes roezli</i> )	Woody	Excellent		Good			
Goosefoot:							
Jerusalem-oak ( <i>Chenopodium botrys</i> )	Annual	Fair					
Nettleleaf ( <i>C. murale</i> )	do	Excellent	Excellent	Excellent		Do	
Oakleaf ( <i>C. glaucum</i> )	do	do	do	do	Fair	Do	
Gooseweed ( <i>Sphenoclea zeylanica</i> )	do	Fair	Poor	Fair	Poor	None	
Gourd, buffalo ( <i>Cucurbita foetidissima</i> )	Perennial	Poor					
Goutweed, Bishops ( <i>Aegopodium podagraria</i> )	do	None					
Grapehyacinth ( <i>Muscari botryoides</i> )	do		Poor				
Greenbrier ( <i>Smilax bona-nox</i> )	Woody	None	None	Poor	Poor		
Common ( <i>S. rotundifolia</i> )	do	do	do	do	do		
Gromwell ( <i>Lithospermum officinale</i> )	Perennial	do					

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Groundcherry:						
Clammy ( <i>Physalis heterophylla</i> )	Woody	None		Fair	Fair	None
Purple flower ( <i>P. lobata</i> )	do	do				
Smooth ( <i>P. subglabrata</i> )	do	do	None	Poor	Poor	Do.
Wrights ( <i>P. wrightii</i> )	Annual	Excellent		Excellent	Excellent	
Ground-ivy ( <i>Glechoma hederacea</i> )	Perennial	Fair	Poor	Fair	Good	
Groundsel:						
Arrowleaf ( <i>Senecio triangularis</i> )	do	do		do		Do.
Common ( <i>S. vulgaris</i> )	Annual	Poor	Poor	None	None	Do.
Cressleaf ( <i>S. glabellus</i> )	do	Excellent	Excellent	Excellent	Good	Good.
Riddell ( <i>S. riddellii</i> )	Perennial	do				
Threadleaf ( <i>S. longilobus</i> )	do	Fair				
Gum:						
Sweet ( <i>Liquidambar styraciflua</i> )	Woody	Poor		Good	Fair	
Tupelo or black ( <i>Nyssa sylvatica</i> )	do	None		Fair	do	
Gumweed ( <i>Grindelia squarrosa</i> )	Perennial	Excellent				
Halogeton ( <i>Halogeton glomeratus</i> )	Annual	Fair	Poor	Poor	Poor	None.
Hawksbeard, smooth ( <i>Crepis capillaris</i> )	Annual <sup>3</sup>	Poor	do	None	None	Poor.
Hawkweed:						
Orange ( <i>Hieracium aurantiacum</i> )	Perennial	Fair	do	Poor		
Yellow ( <i>H. pratense</i> )	do	do	do	do		
Hawthorn ( <i>Crataegus</i> spp.)	Woody	None	None	Fair	Poor	None.
Healall ( <i>Prunella vulgaris</i> )	Perennial	Good	do	Poor	do	Do.
Hellebore, false western ( <i>Veratrum californicum</i> )	do	do				
Hemlock, poison ( <i>Conium maculatum</i> )	Biennial	do	Excellent	Fair	Excellent	Excellent.
Hemp ( <i>Cannabis sativa</i> )	Annual	do		Good		Good.
Hempnettle ( <i>Galeopsis tetrahit</i> )	do	Poor	Fair			
Henbit ( <i>Lamium amplexicaule</i> )	do	do	Poor	Fair	Good	Poor.
Hickory ( <i>Carya</i> spp.)	Woody	do	Fair	do	Fair	None.
Hogpeanut ( <i>Amphicarpa bracteata</i> )	Perennial	Excellent				
Hogpotato ( <i>Hoffmanseggia densiflora</i> )	do	None	None	None	None	Do.
Honey locust ( <i>Gleditsia triacanthos</i> )	Woody	Poor		Fair		
Honeysuckle ( <i>Lonicera japonica</i> )	do	Fair	Excellent	Good	Good	
Horsebrush, littleleaf ( <i>Tetradymia glabrata</i> )	do	Poor		Poor		

Horsenettle, Carolina ( <i>Solanum carolinense</i> )	Perennial	do	None	Fair		Poor.
Horsetail, field ( <i>Equisetum arvense</i> )	do	do	Fair	Poor	Poor	
Horseweed, mare's tail ( <i>Erigeron canadensis</i> )	Annual	Fair	do	Good	Good	Fair.
Houndstongue ( <i>Cynoglossum officinale</i> )	Biennial	do				
Indian-hemp ( <i>Apocynum cannabinum</i> )	Perennial	Poor	None	None		
Indian-tobacco ( <i>Lobelia inflata</i> )	Annual	Fair				
Iris, Rocky Mountain ( <i>Iris missouriensis</i> )	Perennial	do		Poor		
Ironweed, Western ( <i>Vernonia baldwinii</i> )	do	Good		Good	None	Poor.
Ivy, English ( <i>Hedera helix</i> )	do	do		Excellent		
Jerusalem-artichoke ( <i>Helianthus tuberosus</i> )	do	Good		do		
Jewelweed ( <i>Impatiens pallida</i> )	Annual	Excellent				
Jimmyweed ( <i>Haplopappus pluriflorus</i> )	Perennial	Fair		Fair		
Jimsonweed ( <i>Datura stramonium</i> )	Annual	Good	Excellent	Good		Excellent.
Jointvetch, Northern ( <i>Aeschynomene virginica</i> )	do	Fair	Fair	Excellent	Fair	None.
Juniper:						
Alligator ( <i>Juniperus deppeana</i> )	Woody	None		None	None	Do.
One-seed ( <i>J. monosperma</i> )	do	do		do	do	Do.
Utah ( <i>J. osteosperma</i> )	do	Poor		Poor	do	Do.
Knapweed:						
Brown ( <i>Centaurea jacea</i> )	Perennial	Fair				
Diffuse ( <i>C. diffusa</i> )	Biennial	Excellent	None	Poor	Poor	Do.
Russian ( <i>C. repens</i> )	Perennial	Poor	Poor	do	do	Do.
Spotted ( <i>C. maculosa</i> )	Biennial	Fair	Excellent	Fair	Good	
Squarrose ( <i>C. virgata</i> var. <i>squarrosa</i> )	Perennial	do				
Knawel ( <i>Scleranthus annuus</i> )	Annual	None	None			
Kochia ( <i>Kochia scoparia</i> )	do	Excellent	Good	Excellent	Excellent	Excellent.
Knotweed:						
Japanese ( <i>Polygonum cuspidatum</i> )	Perennial	Poor		Poor	do	
Prostrate ( <i>P. aviculare</i> )	Annual	Fair	Poor	Fair	Fair	Poor.
Sakhalin ( <i>P. sachalinense</i> )	Perennial	Good				
Silversheath ( <i>P. argyrocoleon</i> )	Annual	Fair				
Kudzu ( <i>Pueraria lobata</i> )	Perennial	do	Fair	Fair	Fair	
Lambsquarters, common ( <i>Chenopodium album</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Excellent.
Larkspur:						
Little ( <i>Delphinium bicolor</i> )	Perennial	None		None		None.
Menzies ( <i>D. menziesii</i> )	do	Fair		Fair	None	
Tall ( <i>D. barbeyi</i> )	do	None		None		
Duncecap ( <i>D. occidentale</i> )	do	do	None	Fair	Fair	
Lettuce:						
Blue ( <i>Lactuca pulchella</i> )	do	Fair	Fair	do	Fair	Fair.
Wild ( <i>L. scariola</i> )	Annual	Excellent				
See footnotes at end of table.						

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Loco, bigbend ( <i>Astragalus earlei</i> )	Annual <sup>3</sup>	Excellent				
Locoweed, white ( <i>Oxytropis lambertii</i> )	Perennial	Fair		Fair	Fair	
Locust, black ( <i>Robinia pseudo-acacia</i> )	Woody	do		Good	Good	
London-rocket, annual ( <i>Sisymbrium irio</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Excellent.
London-rocket, perennial ( <i>Franseria confertiflora</i> )	Perennial	None	None	None	None	None.
Lupine ( <i>Lupinus rivularis</i> )	Woody	Excellent		Excellent		
Silvery ( <i>L. argenteus</i> )	Perennial	Fair	None	do	Excellent	Excellent.
Tailcup ( <i>L. caudatus</i> )	do	Good				
Madrone ( <i>Arbutus menziesii</i> )	Woody	Fair		Fair		
Mallow:						
Common ( <i>Malva neglecta</i> )	Annual <sup>3</sup>	Poor	None	Poor	Poor	
Dwarf ( <i>M. rotundiflora</i> )	Perennial	Fair				
Little ( <i>M. parviflora</i> )	Annual	do	None			
Venice ( <i>Hibiscus trionum</i> )	do	Good	Excellent	Excellent		
Manzanita ( <i>Arctostaphylos</i> spp.)	Woody	do	Poor	Fair	Fair	Poor.
Maples ( <i>Acer</i> spp.)	do	Poor	None	do	Good	None.
Marshelder ( <i>Iva xanthifolia</i> )	Annual	Excellent	Good	Good	Excellent	Excellent.
Mayweed, dogfennel ( <i>Anthemis cotula</i> )	do	Fair	Poor	Fair	Poor	None.
Medic, Black ( <i>Medicago lupulina</i> )	do	do	Fair	do	Good	Poor.
Mesquite:						
Honey ( <i>Prosopis juliflora</i> var. <i>glandulosa</i> )	Woody	Poor		do	Fair	Fair.
Velvet ( <i>P. juliflora</i> var. <i>velutina</i> )	do	None	None	Good	do	None.
Mexican tea ( <i>Chenopodium ambrosioides</i> )	Annual	Excellent	Excellent	Excellent	Good	Excellent.
Mexican weed ( <i>Caperonia castaneaefolia</i> )	do	Fair	Fair	Good	do	None.
Milkweed ( <i>Asclepias curassavica</i> )	Perennial	Good		Excellent		Do.
Broadleaf ( <i>A. latifolia</i> )	do	Fair			Fair	
Common ( <i>A. syriaca</i> )	do	None	None	Poor	do	Do.
Showy ( <i>A. speciosa</i> )	do	do	do	do	Good	Do.
Eastern whorled ( <i>A. verticillata</i> )	do	do	do	do		Do.
Mimosa, catclaw ( <i>Mimosa biuncifera</i> )	Woody			do		Poor.
Moneywort ( <i>Lysimachia nummularia</i> )	Perennial	Excellent				

Morningglory:							
Common ( <i>Ipomoea purpurea</i> )	Annual	do		Excellent		Excellent.	
Ivyleaf ( <i>I. hederacea</i> )	do	do		do		Do.	
Woolly ( <i>I. hirsutula</i> )	do	do	Excellent	do	Excellent		
Mountain Mahogany ( <i>Cercocarpus montanus</i> )	Woody			Poor		Poor.	
Mudplantain ( <i>Heteranthera limosa</i> )	Annual	Excellent	Good	Good	Good	Fair.	
Mugwort ( <i>Artemisia vulgaris</i> )	Perennial	Poor	None	None			
Mulberry ( <i>Morus</i> spp.)	Woody	None		Poor	Fair		
Mullesears ( <i>Wyethia amplexicaulis</i> )	Perennial	Good		Good			
Mullein:							
Common ( <i>Verbascum thapsus</i> )	Biennial	Poor	Poor	Fair		None.	
Moth ( <i>V. blattaria</i> )	Perennial	Fair		do			
Mustard:							
Black ( <i>Brassica nigra</i> )	Annual	Excellent	Excellent	Excellent	Good	Excellent.	
Blue ( <i>Chorispora tenella</i> )	do	Fair	Poor	Good	do	None.	
Haresear ( <i>Conringia orientalis</i> )	do	Excellent	Good				
Hedge ( <i>Sisymbrium officinale</i> )	do	do	Excellent	Excellent	Excellent	Excellent.	
Indian ( <i>Brassica juncea</i> )	do	do	do	do	Good	Do.	
Tumble ( <i>Sisymbrium altissimum</i> )	do	do	Good	do		Do.	
Wild ( <i>Brassica kaber</i> )	do	do	Excellent	do	Good	Do.	
Wormseed ( <i>Erysimum cheiranthoides</i> )	Annual <sup>3</sup>	do	do	do		Do.	
Nettle:							
Stinging ( <i>Urtica dioica</i> )	Perennial	Good					
Tall ( <i>U. procera</i> )	Annual	do					
Niggerhead ( <i>Rudbeckia occidentalis</i> )	Perennial	do					
Nightshade:							
Black ( <i>Solanum nigrum</i> )	Annual	Fair	Fair	Fair	Good	Fair.	
Cutleaf ( <i>S. triflorum</i> )	do	do					
Silverleaf ( <i>S. elaeagnifolium</i> )	Perennial	Poor		Poor	Poor		
Norcal bean ( <i>Sophora secundiflora</i> )	do			Excellent	Excellent		
Nutsedge:							
Purple ( <i>Cyperus rotundus</i> )	do	Poor	None	None	None	None.	
Yellow ( <i>C. esculentus</i> )	do	do	do	do	do	Do.	
Oak:							
Black ( <i>Quercus velutina</i> )	Woody	do		Fair			
Blackjack ( <i>Q. marilandica</i> )	do	do	None	do	Fair	Do.	
Blue ( <i>Q. douglasii</i> )	do	do	Poor	Poor	do	Poor.	
Gambel ( <i>Q. gambelii</i> )	do			Fair			
Interior live ( <i>Q. wislizenii</i> )	do	Poor	Poor	Poor	Poor	Do.	
Post ( <i>Q. stellata</i> )	do	Fair	None	Good	Good	None.	
Scrub ( <i>Q. dumosa</i> )	do	Poor	Poor	Fair	Fair	Poor.	
Shinnery ( <i>Q. havardii</i> )	do	Fair		Excellent	Excellent		

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Oak—Continued						
Turbinella ( <i>Q. turbinella</i> )	Woody			Poor		Poor.
White ( <i>Q. alba</i> )	do	Fair	None	Good	Fair	None.
Onion, wild ( <i>Allium canadense</i> )	Perennial	do	Poor	Poor		Poor.
Orache ( <i>Atriplex hastata</i> )	Annual	Good		Excellent		
Osage-orange ( <i>Maclura pomifera</i> )	Woody	Poor		Good	Fair	
Parsley, desert ( <i>Lomatium grayi</i> )	Perennial	Excellent	Excellent		Excellent	Excellent.
Parsnip, wild ( <i>Pastinaca sativa</i> )	Biennial	do		Excellent		
Partridgepea ( <i>Cassia fasciculata</i> )	Annual	do	Excellent	do	Excellent	
Passionflower, Maypop ( <i>Passiflora incarnata</i> )	Perennial	Fair				
Peavine ( <i>Astragalus emoryanus</i> )	Annual	Good		Good		
Pellitoryweed ( <i>Parietaria floridana</i> )	do	None	None	Excellent		None.
Pennycress, field ( <i>Thlaspi arvense</i> )	do	Excellent	Excellent	do	Good	Good.
Pennywort, lawn ( <i>Hydrocotyle sibthorpioides</i> )	Perennial	Good		do	Excellent	
Penstemon, Rydberg ( <i>Penstemon rydbergii</i> )	do	Fair		Poor		None.
Pepperweed:						
Field ( <i>Lepidium campestre</i> )	Annual	Excellent	Excellent	Good	Fair	Excellent.
Perennial ( <i>L. latifolium</i> )	Perennial	Fair		Fair		
Virginia ( <i>L. virginicum</i> )	Annual	Excellent	Excellent			Do.
Yellowflower ( <i>L. perfoliatum</i> )	do	do	do	Excellent	Excellent	
Persimmon ( <i>Diospyros virginiana</i> )	Woody	Poor		Poor	Fair	
Texas ( <i>D. texana</i> )	do	Excellent			Excellent	
Pigweed:						
Prostrate ( <i>Amaranthus graecizans</i> )	Annual	do	Excellent	Excellent		Do.
Rough ( <i>A. retroflexus</i> )	do	do	do	do	Excellent	Do.
Tumble ( <i>A. albus</i> )	do	do	do	do	do	Do.
Pineappleweed ( <i>Matricaria matricarioides</i> )	do	Fair	Poor	None	Poor	None.
Plantain:						
Blackseed ( <i>Plantago rugelii</i> )	Perennial	Excellent	Excellent	Excellent	Good	Excellent.
Broadleaf ( <i>P. major</i> )	do	do	do	do	Excellent	Do.
Buckhorn ( <i>P. lanceolata</i> )	do	do	Good	do	do	Do.
Poison-ivy ( <i>Rhus radicans</i> )	Woody	Fair	Fair	do	do	None.
Poison-oak ( <i>Rhus diversiloba</i> )	do	do	Poor	do	do	Do.

Pokeweed ( <i>Phytolacca americana</i> )	Perennial	do	Fair	Good	Good	
Pondweed ( <i>Potamogeton</i> spp.)	do	do	None	Poor	Poor	
Ponyfoot ( <i>Dichondra repens</i> )	do	Excellent				
Poorjoe ( <i>Diodia teres</i> )	Annual	Good	Fair	Good	Fair	Fair.
Poppy, Roemer ( <i>Roemeria refracta</i> )	do	Excellent				
Prickly-ash, Northern ( <i>Xanthoxylum americanum</i> )	Woody	Poor		Fair		
Pricklypear ( <i>Opuntia</i> spp.)	Perennial			do		
Prickly poppy ( <i>Argemone intermedia</i> )	Annual	Excellent				
Purslane, common ( <i>Portulaca oleracea</i> )	do	Fair	Fair	Excellent	Good	Good.
Puncturevine ( <i>Tribulus terrestris</i> )	do	Good	do		Fair	Do.
Pusley, Florida ( <i>Richardia scabra</i> )	do	Excellent				
Queensdelight ( <i>Stillingia sylvatica</i> )	Perennial	None				
Rabbitbrush:						
Gray ( <i>Chrysothamnus nauseosus</i> )	Woody	Fair	Poor	Poor	Poor	
Yellow ( <i>C. viscidiflorus</i> )	do	do	do	do	do	
Radish, wild ( <i>Raphanus raphanistrum</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Excellent.
Ragweed:						
Common ( <i>Ambrosia artemisiifolia</i> )	do	do	do	do	do	Do.
Giant ( <i>A. trifida</i> )	do	do	do	do	do	Do.
Western ( <i>A. psilostachya</i> )	Perennial	Good		do	do	Do.
Ragwort, tansy ( <i>Senecio jacobaea</i> )	Perennial <sup>3</sup>	do	Fair	Fair	Fair	Poor.
Rape, Bird ( <i>Brassica rapa</i> )	Biennial	Excellent	Excellent	Excellent	Excellent	Excellent.
Raspberry ( <i>Rubus</i> spp.)	Woody	Poor	None	Good	Good	None.
Redbay ( <i>Persea borbonia</i> )	do	do		do	Poor	
Redbud ( <i>Cercis occidentalis</i> )	do	do		Poor		
Redvine ( <i>Brunnichia cirrhosa</i> )	Perennial	None	None	do	Poor	Do.
Redstem ( <i>Ammannia coccinea</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Good.
Rose:						
California ( <i>Rosa californica</i> )	Woody	None		Fair		
Cherokee ( <i>R. laevigata</i> )	do	Fair		do	Excellent	
Macartney ( <i>R. bracteata</i> )	do	do	None	Good	Good	
Multiflora ( <i>R. multiflora</i> )	do	Poor	do	Fair	Fair	
Prairie ( <i>R. pratincola</i> )	do	Fair		Excellent		
Woods ( <i>R. woodsii</i> )	do	None		Fair	None	None.
Rubberweed:						
Bitter ( <i>Hymenoxys odorata</i> )	Annual	Excellent				
Colorado ( <i>H. richardsoni</i> )	Perennial	Good		Fair		
Rue, African ( <i>Peganum harmala</i> )	do			do	Fair	
Sage:						
Creeping ( <i>Salvia somomensis</i> )	do	Good	Fair	Good	do	Fair.
Purple ( <i>S. leucophylla</i> )	do	do				

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Sage—Continued						
White ( <i>S. apiana</i> )	Perennial	Good				
Sagebrush:						
Big ( <i>Artemisia tridentata</i> )	Woody	do	Poor	Good	Fair	None.
California ( <i>A. californica</i> )	do	Excellent		do		
Sand ( <i>A. filifolia</i> )	do	do	Good	do	Good	Poor.
Salsify:						
Common ( <i>Tragopogon porrifolius</i> )	Biennial	Good				
Meadow ( <i>T. pratensis</i> )	do	do				
Saltcedar ( <i>Tamarix gallica</i> )	Woody	Poor	None	Fair	Good	None.
Sedge, Umbrella ( <i>Cyperus difformis</i> )	Annual	Fair	Fair	Poor	Poor	
Sesbania, coffeebean ( <i>Sesbania exaltata</i> )	do	do	Good	Good	Excellent	Fair.
Sorrel ( <i>Rumex acetosa</i> )	Perennial	Good	Fair	do	Fair	Do.
Heartwing ( <i>R. hastatulus</i> )	do	Excellent				
Red ( <i>R. acetosella</i> )	do	None	None	None	Poor	None.
Shepherdspurse ( <i>Capsella bursa-pastoris</i> )	Annual	Good	Good	Excellent	Good	Good.
Sicklepod, coffeeweed ( <i>Cassia tora</i> )	do	Excellent	Excellent			
Skunkcabbage ( <i>Symplocarpus foetidus</i> )	Perennial	Good		Good	Fair	
Smartweed:						
Ladysthumb ( <i>Polygonum persicaria</i> )	Annual	do	Fair	do	Good	Do.
Pennsylvania ( <i>P. pensylvanicum</i> )	do	do	do	do	Fair	Do.
Swamp ( <i>P. coccineum</i> )	Perennial	Poor				
Snakeroot, white ( <i>Eupatorium rugosum</i> )	do	Fair		Fair	Poor	
Snakeweed:						
Broom ( <i>Gutierrezia sarothræ</i> )	do	do	Fair	do	do	Poor.
Threadleaf ( <i>G. microcephala</i> )	do	Good		Good	Good	
Sneezeweed, bitter ( <i>Helienium tenuifolium</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Good.
Snow-on-the-mountain ( <i>Euphorbia marginata</i> )	do	Fair		Good	Fair	Fair.
Sowthistle:						
Annual ( <i>Sonchus oleraceus</i> )	do	Excellent	Excellent	Excellent		Excellent.
Perennial ( <i>S. arvensis</i> )	Perennial	Fair	Fair	Fair	Fair	Fair.
Spiny ( <i>S. asper</i> )	Annual	Excellent		Excellent		Excellent.
Spanishneedles ( <i>Bidens bipinnata</i> )	do	do	Excellent	do	Excellent	

Speedwell:							
Common ( <i>Veronica officinalis</i> )	Perennial	Poor	None	None	Poor	None.	
Corn ( <i>V. arvensis</i> )	Annual	do	do	do	do	Do.	
Purslane ( <i>V. peregrina</i> )	do	Fair	do	Fair	do		
Spikerush ( <i>Eleocharis palustris</i> )	Perennial	do	Fair	Poor	Poor	Poor.	
Spurge:							
Flowering ( <i>Euphorbia corollata</i> )	do	Poor		Good			
Leafy ( <i>E. esula</i> )	do	do	None	Poor	Fair	None.	
Spotted ( <i>E. maculata</i> )	Annual	do		do	Fair		
Spurry, corn ( <i>Spergula arvensis</i> )	do	do	Fair	None	Fair	Do.	
Squaw-berry ( <i>Rhus trilobata</i> )	Woody			Poor		Poor.	
Starthistle, yellow ( <i>Centaurea solstitialis</i> )	Annual	Fair				None.	
Sticktight, European ( <i>Lappula echinata</i> )	do	Good					
Strawberry, wild ( <i>Fragaria</i> spp.)	Perennial	Poor	None	Poor	Fair	Do.	
St. Johnswort ( <i>Hypericum perforatum</i> )	do	do					
Spotted ( <i>H. punctatum</i> )	do	Fair		Fair			
Sumpweed, rough ( <i>Iva ciliata</i> )	Annual	Excellent					
Sunflower ( <i>Helianthus annuus</i> )	do	do	Good	Excellent	Excellent	Excellent.	
Sweetclover, annual yellow ( <i>Melilotus indica</i> )	do	do	Excellent			Do.	
Tanoak ( <i>Lithocarpus densiflora</i> )	Woody	Poor		Poor	Poor	Poor.	
Tansy ( <i>Tanacetum vulgare</i> )	Perennial	Fair	None	Fair			
Tansymustard ( <i>Descurainia pinnata</i> )	Annual	Excellent					
Thistle:							
Blessed ( <i>Cnicus benedictus</i> )	do	do					
Blue ( <i>Echium vulgare</i> )	Biennial	Fair	Fair	Fair			
Bull ( <i>Cirsium vulgare</i> )	do	Excellent	Excellent	Excellent	Excellent	Excellent.	
Bristly ( <i>C. horridulum</i> )	Perennial <sup>s</sup>	Fair					
Canada ( <i>C. arvense</i> )	Perennial	do	Fair	Fair	Fair	Fair.	
Russian ( <i>Salsola kali</i> )	Annual	Good	Good	Good	Good	Good.	
Tickseed ( <i>Coreopsis tinctoria</i> )	do	do		Excellent			
Toadflax:							
Blue ( <i>Linaria canadensis</i> )	Perennial	Poor					
Yellow ( <i>L. vulgaris</i> )	do	None	None	None	None	None.	
Toyon ( <i>Heteromeles arbutifolia</i> )	Woody	Good	Fair	Fair	Fair	Fair.	
Tree-of-heaven ( <i>Ailanthus altissima</i> )	do	Fair	None	Excellent	Good	Poor.	
Trumpet creeper ( <i>Campsis radicans</i> )	do	Poor	do	Fair	Excellent	None.	
Velvet-leaf ( <i>Abutilon theophrasti</i> )	Annual	Excellent	Good	Good		Excellent.	
Vervain:							
Blue ( <i>Verbena hastata</i> )	Perennial	do					
Hoary ( <i>V. stricta</i> )	do	Good					
Prostrate ( <i>V. bracteata</i> )	do	Excellent					
Roadside ( <i>V. bonariensis</i> )	do	Good					

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
<b>Vetch:</b>						
Narrowleaf ( <i>Vicia angustifolia</i> )	Annual	Excellent	Fair	Excellent		
Milk ( <i>Astragalus</i> spp.)	Perennial	Good	do	Good	Excellent	
Two grooved ( <i>A. bisulcatus</i> )	do	Excellent				
Wild ( <i>Vicia</i> spp.)	Annual	do	Excellent	Excellent	Excellent	Excellent
<b>Violet (<i>Viola</i> spp.)</b>						
Walnut, black ( <i>Juglans nigra</i> )	Woody	Excellent		Excellent		
Waterhemlock, spotted ( <i>Cicuta maculata</i> )	Perennial	Good		do		
Water-hyacinth ( <i>Eichhornia crassipes</i> )	do	do		do	Excellent	
Waterplantain ( <i>Alisma triviale</i> )	do	Excellent	Excellent		do	Good
Waterweed, Canada ( <i>Elodea canadensis</i> )	do	Fair			do	
Willow ( <i>Salix</i> spp.)	Woody	Good	Good	Good	Good	
Witchweed ( <i>Striga asiatica</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Excellent
Woodsorel, yellow ( <i>Oxalis stricta</i> )	Perennial	Poor	None		do	
Wormwood, annual ( <i>Artemisia annua</i> )	Annual	Good	Fair	Good		
Yankee weed ( <i>Eupatorium compositifolium</i> )	Perennial	Fair		Fair		
<b>Yarrow:</b>						
Common ( <i>Achillea millefolium</i> )	do	Poor	Poor	Poor	Poor	None
Western ( <i>A. lanulosa</i> )	do	Fair		Fair		Do.
Yellow-rocket ( <i>Barbarea vulgaris</i> )	Perennial <sup>3</sup>	Good	Good	Good	Fair	Fair
Yerba-santa ( <i>Eriodictyon californicum</i> )	Woody	Excellent	do	do	do	None
Yucca; soapweed ( <i>Yucca glauca</i> )	Perennial	None		Poor	do	

<sup>1</sup> For explanation of control ratings, see "Susceptibility Chart," page 11.

<sup>2</sup> See limitation of use of 2,4,5-T, page 2.

<sup>3</sup> Sometimes biennial.

FROM: (Station or unit)

U. S. Navy, PWC, Guam

DATE

16 Nov 83

TO: (Name and location of laboratory)

U. S. Navy, PWC Fena Laboratory, Guam

SAMPLE FROM (Location of sampling point)

Well B, Nav Cams

COLLECTED BY

Joan Ornato

DATE

13 Apr 83

HOUR

0945

SOURCE (Designate ground, surface, raw, treated)

Ground

REASON FOR EXAMINATION

Annual Analysis

EXAMINATION REQUESTED BY

NOTE: All results reported in parts per million unless otherwise noted except for pH, temperature, and specific conductance. One liter of potable water is assumed to weigh one kilogram.

I. FIELD ANALYSIS			III. ROUTINE LABORATORY ANALYSIS	
1. pH	TEMPERATURE		(CHECK ONE)	
7.40	°F	°C 27.5	<input checked="" type="checkbox"/> REQUESTED	<input type="checkbox"/> NOT REQUESTED
ITEM	PPM		1. COLOR	
2. CARBON DIOXIDE (CO <sub>2</sub> )	110		3	
3. DISSOLVED OXYGEN (O <sub>2</sub> )			2. TURBIDITY	
4. HYDROGEN SULFIDE (H <sub>2</sub> S)			0.35 NTU	
5. CHLORINE DEMAND (Cl <sub>2</sub> )			3. ALKALINITY (CaCO <sub>3</sub> )	
FIELD ANALYSIS BY			P	MD
Joan Ornato			0	139
DATE OF ANALYSIS			4. TOTAL HARDNESS (CaCO <sub>3</sub> ) (Computed)	
13 April 83			158	
II. SPECIAL LABORATORY ANALYSES			5. NON-CARBONATE HARDNESS (CaCO <sub>3</sub> ) (By Computation)	
Check (X) individual items to be included in the Special Analyses. Request determination only of those substances suspected of being present in significant amounts.			19	
(X)	ITEM	PPM	6. CARBONATE HARDNESS (CaCO <sub>3</sub> ) (By Computation)	
X	1. As	< 0.001	139	
X	2. Se	< 0.001	7. TOTAL DISSOLVED SOLIDS	
X	3. Pb	0.02	228	
X	4. Ba	< 0.5	8. SPECIFIC CONDUCTANCE (Micromhos)	
X	5. Cu	0.15	441	
X	6. Zn	< 0.04	ITEM	
X	7. Cr (Hexavalent)	< 0.05	9. CALCIUM (Ca)	
	8. PO		55	
X	9. Cd	< 0.01	10. MAGNESIUM (Mg)	
	10. CN		5	
X	11. Phenolic Compounds (PPB)		11. SODIUM (Na) AND POTASSIUM (K)	
X	12. Others (Specify) Ag	< 0.01	38.2	
X	13. Hg	< 0.001	12. HYDROXIDE (OH)* (Computed)	
X	14. Endrin (µg/l)	< 0.128	0	
X	15. Lindane (µg/l)	< 0.035	13. BICARBONATE (HCO <sub>3</sub> )* (Computed)	
X	16. Methoxychlor (µg/l)	< 0.526	139	
			14. CARBONATE (CO <sub>3</sub> )* (Computed)	
			0	
			15. SULFATE (SO <sub>4</sub> )	
			11.4	
			16. CHLORIDE (Cl)	
			78.8	
			17. NITRATE <del>(NO<sub>3</sub>)</del> (as nitrogen)	
			1.21	
			18. IRON (Fe) TOTAL	
			< 0.023	
			19. MANGANESE (Mn)	
			< 0.05	
			20. SILICA (SiO <sub>2</sub> )	
			1.17	
			21. FLUORIDE (F)	
			< 0.12	
REMARKS (Such as unusual appearance, taste, odor, etc.)				
X	17. Toxaphene (µg/l)	< 3.60	Langelier's Index = -.515	
X	18. 2, 4-D (µg/l)	< 0.05		
X	19. Silvex (µg/l)	< 0.21		
LABORATORY ANALYSIS BY			DATE OF ANALYSIS	
EB/RT/JO				

DD FORM 710

1 APR 53

REPLACES WD AGO FORM 8-125, 1 APR 45, WHICH MAY BE USED.

GPO 83-56027



**DEPARTMENT OF VETERANS AFFAIRS  
Louisville Regional Office  
321 W Main Street, Suite 390  
Louisville KY 40202**

**Robert L. Burgett**



**Decision Review Officer Decision  
March 27, 2007**

**INTRODUCTION**

The records reflect that you are a veteran of the Vietnam Era. You served in the Air Force from May 26, 1966 to March 27, 1970 and the Marine Corps from January 8, 1971 to December 11, 1972. We received a Notice of Disagreement from you on January 25, 2007 about one or more of our earlier decisions. Based on a review of the evidence listed below, we have made the following decision(s) on your claim. **This decision is considered under the de nova review process.**

**DECISION**

1. Service connection for cancer of the larynx with laryngectomy and hemithyroidectomy is granted with an evaluation of 100 percent effective May 17, 2006. **This is considered a full grant of benefits sought on appeal and is now closed.**
2. Service connection for scar of the neck, residuals of laryngectomy and hemithyroidectomy is granted with an evaluation of 10 percent effective May 17, 2006.
3. Entitlement to special monthly compensation based on complete organic aphonia with constant inability to communicate by speech is granted from May 17, 2006.

4. Basic eligibility to Dependents' Educational Assistance is established from May 17, 2006.

#### **EVIDENCE**

- All evidence contained in claims file to include numerous medical records from private and VA facilities, lay statements, military personnel records, service medical records 5/66 to 3/70 and 1/71 to 12/72
- Reopened claim received May 17, 2006
- Copies of prior BVA decisions
- Numerous articles on Agent Orange and chemicals used in Vietnam, Guam, and the Pacific
- VA Medical Centers Lexington and Huntington treatment records dated 11-12-02 through 3-13-07
- Informal Conference held on March 27, 2007
- Statement in Support of Claim dated 2-6-07
- Election of post decision review process dated 2-6-07
- Notice of Disagreement received 1-25-07
- Statements from Jimmy Young, Vance Sanderson, Donald Martin, and Roger Richmond
- Statement from claimant received 7-14-06
- Copies of photographs

#### **REASONS FOR DECISION**

##### **1. Service connection for cancer of the larynx with laryngectomy and hemithyroidectomy.**

Review of evidence from the NPRC shows that you were on TDY and were stationed at Anderson AFB, Guam for the period March 5, 1968 to September 4, 1968 and June 7, 1969 to September 18, 1969. AF Form 7 shows you were a material facility specialist. It also shows that you were on TDY from July 13, 1967 to October 15, 1967, but does not specify where your TDY was performed. You stated while stationed in Guam, you moved chemical stored in drums from one part of the storage area to another and periodically the drums would drop and chemicals would spray on you. It is also noted that while serving in Guam chemicals around the base was used to control the weeds.

Report dated June 23, 2006, Petition for Justice and Peace for Guam and the Pacific reported that soldiers stationed on Guam who have handles Agent Orange in the late 1960's have become ill and symptoms of dioxin poisoning became apparent in the general population of the island, according to the Dow Chemical Investor Risk Report. It is also noted new information has surfaced as the Guam legislature prepares for introduction of a

resolution to ask Congress to include the island in the investigation into the chemical or biological warfare testing projects secretly conducted by the Department of Defense in various locations from 1954 to 1973. It is noted that the Dow Chemical Report that dioxin contamination has been measured at up to 1,900 ppm in some areas of Anderson Air Force Base. Evidence reviewed shows Agent Orange on Guam was confirmed. During the Vietnam War era, Guam was used as a storage facility for Agent Orange, a kind of chemical herbicide used in Vietnam in 1968 and 1969. A CBS News Report on June 12, 2005 stated that Agent Orange was sprayed on Guam from 1955 to 1960's. Report from Dr. Uis Szyfred noted problem with contamination of Guam with toxic chemicals is very complex due to the amount of chemicals, the dispersion factors (evaporation, rain, infiltration, winds, etc), the mechanisms of human exposure (infiltration, food, water, skin etc) but most of all because of government's censorship/cover up. More than 2,000 documents and obtained evidence of contamination of food, water, plants etc. Reports also noted extreme limited number of Air Force records that do not refer to the use of Agent Orange or other chemicals in routine base maintenance activities such as spraying along railroad tracks, weed control on rifle ranges, etc. Information on such does not exist.

Your military occupation duties as a material facility specialist requiring you to handle storage barrels at the Anderson Air Force Base and supporting photographs verifying your handling of these barrels as well as the numerous reports of herbicides used and stored at the Air Force Base, it is conceded you were exposed to herbicides while on TDY in Guam.

Numerous medical statements and treatment records show treatment for larynx cancer which required total laryngectomy and hemithyroidectomy in 1993. You currently use a prosthesis for verbal communication. On December 31, 2003 it is noted you are 10 years status post TL and XRT for laryngeal cancer. You are currently doing well and dysphagia complaints are completely resolved with GERD treatment.

Service connection may be granted for specific diseases or conditions which are presumed to have been caused by service if manifested to a compensable degree following military discharge. Although not shown in service, service connection for cancer of the larynx with laryngectomy and hemithyroidectomy has been granted on the basis of presumption. Although you do not meet the requirement of service in the Republic of Vietnam for application of the presumption of exposure to herbicides, the overwhelming evidence does suggest you were exposed to herbicides while stationed in Guam. You are also shown to have a medical diagnosis of larynx cancer which is recognized as being associated with herbicide exposure, under 38 CFR 3.309e. Therefore, service connection for cancer of the larynx, status post laryngectomy and hemithyroidectomy is granted with an evaluation of 100 based on total laryngectomy and hemithyroidectomy.

Hi Van

I have been getting your e-mails, and I have replied to you, but mine have been returned with a message saying your e-mail is full. You may want to check the space in your e-mail, or check with your Internet provider. You may have too many messages, and need to delete some, or else save them to a different file on your hard drive.

I got a few pictures that I want you to look at; they were all taken at GUAM when I was over there.

Picture # 2 is one of the supply yards. The drums are marked orange rings and orange tops for AO, white rings and white tops for Agent White and blue rings and tops for agent Blue, you will see all kinds in these pictures.

Picture # 3 the handsome guy on the forklift is me.

Picture # 4 is a field after we sprayed; we were making a supply yard.

Picture # 5 shows the drums of Agent White.

Picture # 6 shows more of drums of Agent Orange.

These are just a few of the pictures that I have.

I e-mailed a few senators and representatives, but none have gotten back to me. I still need to find a way to prove I was exposed, I need Air Force records.

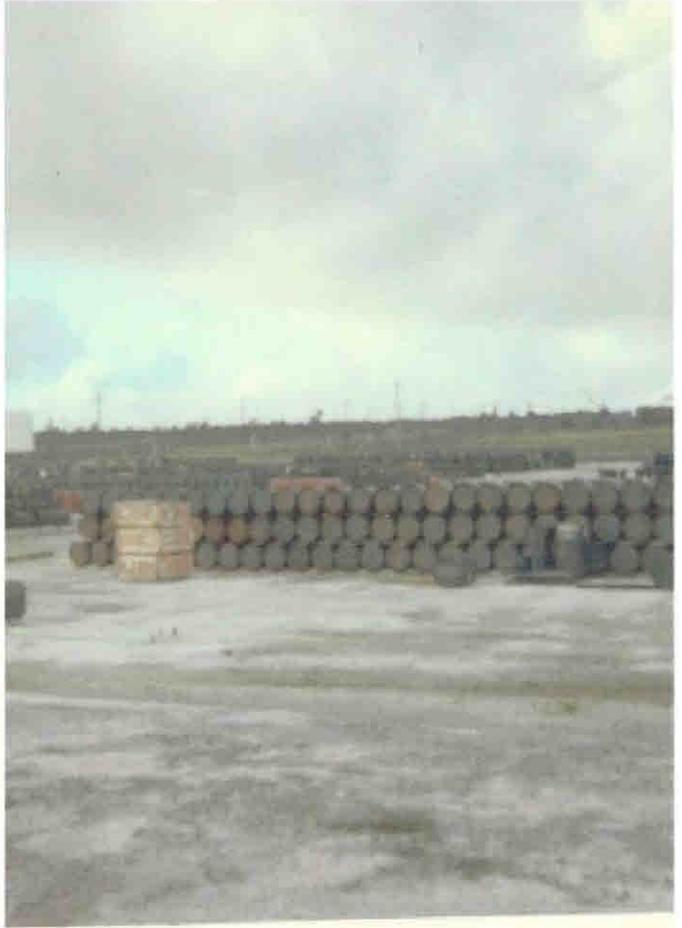
If you come up with anything else or talk to anyone that may have other information that may help let me know.

Good luck with your claim.

Robert Burgett  
P.O. Box 533  
Belfry, KY. 41514  
606-237-4511



4



6



5



July 5, 2007

Department of Veterans Affairs

Veterans Appeals Board

Washington, DC

Dear Sir:

I served in the Air Force in 1967, 1968, and 1969, and I was sent TDY to Guam three times. I was assigned to supplies, and my job consisted of supervising the supply yard. Supplies were sent to Guam, and then loaded on planes to send to Vietnam. These supplies included Agent Orange. I frequently used a fork lift, and drove a tractor trailer to transport the drums of Agent Orange.

Agent Orange was shipped to Guam, and the Air Force unloaded the ships, hauled the chemicals to the stock yard, and later loaded the air planes to send Agent Orange to Vietnam. We also used Agent Orange to spray around Andrews Air Force base to contain the weeds. We did not know the health hazards that these chemicals could cause, so we did not take precautions. We were not given protective clothing, and due to the heat, we often took our shirts off. It was not unusual for the fork lifts to puncture drums, causing the chemical to spray out on us.

I suffer from numerous health problems due to my exposure to Agent Orange. I have had throat cancer, skin cancer, chloracne, and lung disease. If you would like further information, please do not hesitate to contact me.

Sincerely,

Robert Burgett

606-237-4511

Roger Richmond  
120 Double R Lane  
Daniels, WV 25832

November 21, 2002

Department of Veterans Affairs  
Louisville Regional Office  
545 South Third Street  
Louisville Ky 40202

Dear Sir,

I am writing on behalf of Robert Burgett. We were stationed together at Pease Air Force Base in New Hampshire. We were sent TDY to Guam sometime during 1967,68, or 1969. We both worked in the supplies. One part of our job included loading, unloading, and stockpiling drums of Agent Orange and other hazardous chemicals. We also transported them in trucks from the supply yard to airplanes.

I have seen the photographs that Robert has of the supply yard, and can state that these photographs were taken in Guam. I am also in one of the photographs; I am driving a forklift.

Sincerely,

Roger Richmond

Jimmy Dale Young  
P.O. Box 324  
Sidney, Ky. 41564

January, 15, 2003

Dear Sir:

My name is Jimmy Dale Young, I live at Sidney, Kentucky. Bob Burgett has been a friend of mine since high school. Bob and I were stationed at Pease Air Force Base in New Hampshire. We were sent to Guam in Feb, 1969. While in Guam we both were in supplies. I was a truck driver and my job was to pick up truck loads of Agent Orange, and other hazardous chemicals, and haul them to the air craft. I unloaded the drums from the truck and put them on the airplanes.

I have gone to the supply yard and picked up these chemicals from Bob Burgett, I have seen him loading the chemicals in the same supply yard where I worked. I have also seen the pictures that were taken of the supply yard, and know that these photos were actually taken in Guam.

Sometimes we dropped the drums, or ran a forklift through one, but this was not something we reported. We did not know the danger of the chemicals at that time.

The military recognizes that Agent Orange was used in Vietnam, but they are overlooking the fact that someone had to store the chemicals, and load the chemicals in order to get them transported to Vietnam.

I will be happy to answer any questions you have that would help Mr. Burgett.

Sincerely yours,

Jimmy D. Young

A handwritten signature in cursive script that reads "Jimmy D. Young". The signature is written in dark ink and is positioned to the right of the typed name "Jimmy D. Young".

## 38 CFR 3.102 - Reasonable doubt.

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It is the defined and consistently applied policy of the Department of Veterans Affairs to administer the law under a broad interpretation, consistent, however, with the facts shown in every case. **When, after careful consideration of all procurable and assembled data, a reasonable doubt arises regarding service origin, the degree of disability, or any other point, such doubt will be resolved in favor of the claimant.** By reasonable doubt is meant one which exists because of an approximate balance of positive and negative evidence which does not satisfactorily prove or disprove the claim. It is a substantial doubt and one within the range of probability as distinguished from pure speculation or remote possibility. It is not a means of reconciling actual conflict or a contradiction in the evidence. Mere suspicion or doubt as to the truth of any statements submitted, as distinguished from impeachment or contradiction by evidence or known facts, is not justifiable basis for denying the application of the reasonable doubt doctrine if the entire, complete record otherwise warrants invoking this doctrine. **The reasonable doubt doctrine is also applicable even in the absence of official records,** particularly if the basic incident allegedly arose under combat, or similarly strenuous conditions, and is consistent with the probable results of such known hardships.

(Authority: 38 U.S.C. 501) [50 FR 34458, Aug. 26, 1985, as amended at 66 FR 45630, Aug. 29, 2001]

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