IDAHO NOXIOUS WEED CONTROL

ENVIRONMENTAL ASSESSMENT

FINAL

IDAHO STATE OFFICE
Bureau of Land Management

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Idaho State Office
3380 Americana Terrace
Boise, Idaho 83706

IN REPLY
REFER TO:

IDAHO NOXIOUS WEED CONTROL ENVIRONMENTAL ASSESSMENT

January 18, 1985

Dear Citizen:

Enclosed is a copy of the environmental assessment for Idaho's noxious weed control program. The document describes and analyzes the environmental impacts of three alternative noxious weed control programs that could be used on Idaho public lands. A fourth alternative is to allow continued spread of the noxious weeds. Two of the alternatives, including the proposed action, involve the use of herbicides.

Written comments are invited on the adequacy of the alternatives and the impact analysis. Written comments must be received on or before February 20, 1985, to be considered in the decision process. Written comments are to be submitted to:

Steve Ellis
Bureau of Land Management (930)
Idaho State Office
3380 Americana Terrace
Boise, ID 83706

We look forward to your comments and thank you for your past and future assistance in our efforts to manage public lands in the best interests of all concerned.

Sincerely yours,

Clair M Whitlock
State Director

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I. PURPOSE AND NEED

Purpose

The purpose of the proposed weed control is twofold:

1. To reduce present and future economic losses to ranchers, farmers, and the general public caused by reduced crop yields, lowered rangeland productivity, and costly weed control efforts. These losses could be reduced by controlling the designated noxious weeds on public lands.

2. To comply with state and federal laws. Federal law restricts interstate shipping of contaminated products and addresses itself to weed infestations on federally owned land (Carlson-Foley Act, PL90-583 and Federal Noxious Weed Act of 1974, PL93-629). The Idaho Noxious Weed Law (Title 22, Chapter 24, Idaho Code) applies to all infested land within the state--private, state, or federally owned. Both state and federal laws have quarantine provisions that can be used as enforcement measures (Appendix E and F).

The Bureau of Land Management (BLM) is responsible for implementing the proposed weed control program on public land and may do so through cooperative agreements with county weed control districts. The Idaho Department of Agriculture is responsible for coordinating weed control activities on federal, state, and private land. Proposed control efforts to minimize infestations of noxious weeds will use an interdisciplinary approach.

The need to control noxious weeds has been recognized by federal and state law makers. It is also demonstrated by annual estimated economic losses which could be reduced by an effective weed control program.

Background

Noxious weeds have become established and are spreading on public and private lands in Idaho. They continue to pose a threat to the public welfare and the state's economy. A University of Idaho study estimated the economic loss due to weeds in Idaho to be more than $500,000,000 per year (Lee, 1980). The Idaho State Legislature recognized the seriousness of the noxious weed problem and passed the Noxious Weed Law (Title 22, Chapter 24, Idaho Code) which places the primary duty and responsibility for controlling the spread and eradication of noxious weeds with the landowner or custodian. This could be a district irrigation or canal company, highway district, county, city, state, or federal government agency (Title 22, Chapter 2441). Each accountable party is responsible for implementing and pursuing effective control programs to minimize the impact of noxious weeds. The law also authorizes the board of county commissioners to initiate the organization of a county-wide weed district (Title 22 Chapter 2443A).

The Director of the Idaho Department of Agriculture has published a list of currently designated noxious weed species (Appendix A). The federal government also publishes a list of noxious weeds. Both lists are periodically updated. This EA applies to any weed that occurs on either of these two lists. Survey results identified infestations of several of these species on BLM administered public land in Idaho (Table 1). These weed species and areas where they occur are shown on Maps 1-6. The weed control areas shown on these maps do not indicate the size of the infestations, but rather show weed distribution throughout each district in the state. Other weed species infest BLM land but are not designated as noxious and will not be considered in this report.

Over recent years, BLM has allowed the counties to enter and control noxious weeds on BLM land because, in most cases, county officials were treating adjacent weed infested non-BLM land. In each year, about 1,800 acres of public lands administered by the BLM have been treated for noxious weed control by the counties. This has allowed for all lands to be treated in one efficient operation. The BLM has treated approximately 400 acres of public land for noxious weed control annually. These operations were in response to the Idaho Noxious Weed Law.

Issues

The primary controversy in implementing a noxious weed control program centers not around whether or not to control noxious weeds, but rather on what methods are acceptable from a human health viewpoint. The primary concern is the risks associated with chemical treatment.

Other issues deal with acute and chronic effects of herbicides on fish and wildlife, soil, water quality, non-target plant species, and on soil erosion.

Alternative weed control programs have been developed to address these issues. A "no action" alternative has been included to serve as a baseline for analysis purposes. The "no action" alternative would not achieve the objective of weed control, nor would it comply with state and federal law calling for noxious weed control.

II. PROPOSED ACTION AND ALTERNATIVES

ALTERNATIVE A

(Proposed Action for Integrated Herbicidal Ground and Helicopter Aerial Application, Manual, Mechanical, and Biological Control)

Noxious weeds on public land are controlled either by the BLM conducting activities or by the counties. During recent years, several counties have had cooperative agreements with BLM under which they controlled noxious weeds on public land.

It is estimated that 59,440 acres of Idaho public land are infested with noxious weeds (Table 1). The location(s) of which are shown, by district, on map(s) 1-6. Of these known infestations, a total of 8,832 acres are proposed for treatment in FY 85 with subsequent followup treatments, or continued maintenance programs, for the next five years as needed (Table 2); however, budget constraints will probably limit the FY 85 treatment to no more than 3,000 acres. Treatment would not be limited to those sites which are known locations of noxious weeds. Treatment may also be applied to any BLM land in the state of Idaho where noxious weeds occur when the action would be consistent with existing land use plans. Control efforts on a number of the acres proposed in the action have been in effect during the past five years under prior agreements (Table 3). An exception to this was in 1984, when no herbicides were used to control weeds on BLM land in Idaho. Funding availability will dictate the extent to which the proposed program would be carried out in FY 85 and in each subsequent year. The majority of the actual ground weed control work would be accomplished by county weed control supervisors.

Control measures utilized by the proposed action are manual and mechanical, herbicidal, and biological. They are tailored to the individual weed species or weed complexes under various habitat types and conditions. Each of these measures or components will be discussed as elements of the proposed action.

Variables that are important factors in determining which control measures should be used in a given area are:

--The characteristics of the weed species (annual, biennial, perennial).
--Location of the infestations (cropland, rangeland, riparian, roadside, irrigation canal banks).
--Proximity of infestation to sensitive areas (threatened and endangered plant or animal species, riparian zones, significant aquatic resources, and unstable watersheds).

These variables interact from one weed location to another enhancing the possibility of combining two or more control measures.

Components of the Proposed Action

1. Physical Control - Choice of a physical control method depends upon the characteristic of the target weed species (growth habit, habitat and life span) and on the accessibility of the weed infestation.

Tillage methods, mowing, cutting, and smothering techniques work well with annual and biennial weeds (Musk thistle and Plumeless thistle). Biennial weeds are also responsive to hand grubbing. Perennial weeds such as Canada thistle, Perennial pepperweed, White top, Leafy spurge, and Russian knapweed are difficult to control with hand grubbing and other tillage methods due to their rhizomatous root systems that allow for significant vegetative reproduction.

Tillage and mowing control weeds in two ways. Properly timed, these methods prevent plants from producing seeds and repeated efforts can deplete the underground food supply of some perennials. Other perennials are more resistant to the depletion of underground food reserves and require as many as three control efforts per year for up to three years. These methods are often hampered by terrain, access, and economics.

Most weeds should be tilled, burned, or cut in the bud stage or earlier to prevent the production of viable seed that can occur as early as the flowering stage. Perennial weeds should be tilled or cut in the early bloom stage when underground food reserves are lowest.

Smothering techniques sometimes work well on small annual or biennial weed infestations but are ineffective on most perennial weed infestations.

Most physical control methods have limited usefulness and are not economically feasible on perennial weed infestations, riparian areas, and unaccessible terrain.

2. Biological Control - At this time, biological control will be limited to the use of the Thistle weevil (Rhinocyllus conicus) in controlling various species of thistle that occur on BLM lands in Idaho; it's use will be very limited. Biological control, using the Thistle weevil, was covered in a previous environmental analysis (EA No. ID-81-01) which is on file in the Idaho State Office. If a new biological control method is researched and becomes available, it will be evaluated for use on noxious weeds once an EA is approved.

3. Herbicidal Control - The most effective method available to control noxious weed infestations is the use of herbicides; therefore, the use of herbicides will be the major part of the proposed action. The herbicide control program outlined in this action will be considered on all BLM land in Idaho where noxious weeds occur (Maps 1-6). The herbicidal control program proposed for 1985 is shown in Table 4. Treatment will primarily occur within the infestation problem areas shown on Maps 1-6. Table 5 lists proposed treatment formulations, application methods and optimum phenotypic growth stage for treatment. In subsequent years, locations proposed for herbicidal control will be on file in each respective BLM district office. Herbicides will also be considered for use in gaining quick and effective control of "spot" outbreaks of noxious weeds that may occur outside the known infestation areas shown on Maps 1-6.

The herbicides proposed for control of noxious weeds on BLM land in Idaho include: picloram (Tordon); dicamba (Banvel); glyphosate (Rodeo and Roundup[1/]); both 2,4-D amine and ester formulations; and amitrole (Amatrol-T)*.

Table 1 presents a summary of the weed species identified on Idaho BLM land in 1984. The weed control program would begin in the early spring of 1985 and continue through 1990 with continued maintenance that could extend beyond the five-year time period. If a new chemical comes on the market that is approved by the U.S. Environmental Protection Agency and the Idaho Department of Agriculture for noxious weed control in Idaho, it will be evaluated as an amendment to this EA before its use.

Proposed Herbicide Formulations: picloram (Tordon), dicamba (Banvel), 2,4-D amine and ester, glyphosate (Rodeo and Roundup), and tank mixes of 2,4-D amine and dicamba (Banvel), 2,4-D ester and dicamba (Banvel), and picloram (Tordon) plus 2,4-D amine. Where essential, diesel oil may be mixed in as a carrier with any of these formulations. The formulations, trade, common, and chemical names, and EPA registration numbers are presented in Table 6. Specific application rates are presented in Table 5. Application rates will not exceed label recommendations.

A. Herbicide Application Methods: Various methods are proposed to apply herbicides to designated noxious weed infestations. The application method chosen for use is contingent on the weather conditions, proximity to riparian zones, type of vegetative cover, topography, and the size of the weed infestation in a given area. Specific descriptions of each method follow:

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*The trade names shown in parenthesis are used in this publication to simplify the information presented. Use of trade name does not imply an endorsement of the product nor criticism of similar products that are not mentioned. The chemical recommendations made in this publication are based on the best information available at the time of printing.

1/ Roundup will be used only for control of noxious weeds at the Russell Bar seed orchard in the Coeur d'Alene District until such a time that the EPA approves it for rangeland applications.

1. Helicopter Aerial Application - Liquid formulations of either picloram, 2,4-D amine and ester or the tank mix of picloram and 2,4-D amine, dicamba and 2,4-D ester, or dicamba and 2,4-D amine, will be applied by helicopter.* Nozzles to minimize drift will be used for all aerial helicopter application of liquid herbicides. Spray pressure in the boom will normally be 20 to 35 pounds per square inch. Droplet size would be greater than 100 microns. Application will be made with the helicopter from a height of 10-20 feet. Speed of the helicopter shall not exceed 50 mph during application and all liquid formulation treatment will occur when wind velocity is 8 mph or less (generally early morning). In the interest of safety, where steeper (greater than 50% slopes) canyon areas exist, application height will be 15-30 feet. To minimize drift at this higher altitude, no application will be made when surface wind velocities exceed 6 mph. No herbicides will be applied when raining or when rain is expected, to minimize the effectiveness of the chemical being applied, and to minimize water pollution. Also, no herbicides will be applied when air turbulence (thermal up drafts, etc.) is so great as to seriously affect the normal spray pattern. All aerial application, particularly near live water (perennial or ephemeral), still water (ponds or lakes) or irrigation canal banks, would require the direct consultation and approval of the resource area managers prior to the action. An unsprayed buffer zone of 200 feet will be maintained near any significant aquatic resource. Aerial helicopter application will also require that a 500-foot unsprayed buffer strip will be left adjacent to inhabited dwellings unless waived, in writing, by the resident.

   Specific herbicide labels may specify boom pressures, air speeds, aircraft heights, and nozzle configurations that are considered desirable to reduce drift and increase effectiveness. In the event of a conflict, the label specifications will be followed in lieu of the requirements mentioned above.

2. Vehicular Mounted Boom Sprayers and Hand Spray Gun - These two methods would mostly be used in non-riparian zones, accessible by vehicle, including road right-of-ways, gravel pits, etc. Near water the spray boom would only be used, where feasible, to treat solid weed infestations. The hand spray gun would be used up to the high water line, and for spot treatment of weed infested areas. Neither method will be used in riparian areas where weeds are closely intermingled with shrubs and trees, such as willows. In these areas, more selective hand, backpack, and wipe application methods will be made, and then only when wind is blowing away from bodies of water and other sensitive areas. With both methods, sprays would be applied at a height of 1.5 to 2 feet when wind velocity is below 8 mph, except in riparian areas where treatment would only be conducted when surface wind velocity is below 4 mph. 2,4-D ester would not be used within 100 feet of a significant aquatic resource. Vehicular mounted boom sprayers would not be used within 25 feet of a significant aquatic resource.

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*Glyphosates such as Rodeo will not be applied aerially.

TABLE 1
ESTIMATED IDAHO PUBLIC LAND ACREAGE INFESTED WITH NOXIOUS WEEDS - 1984

trict	County	This-tle 1/	White Top	Yellow Star-thistle	Knap-weed 2/	Leafy Spurge	Hen-bane	Skel-eton weed	Dyers woad	Buf-falo bur	Toad-flax 3/	Teasel	Crupina	Poison Hemlock	Death Camas	Mediter-ranean Sage	Total Acres
ISE	Ada	2,000	1,000														3,000
	Adams	500		10				100									610
	Boise	300				Tr		1,000									1,300
	Canyon	100															100
	Elmore	1,100	200		Tr												1,300
	Gem	300	100														400
	Owyhee	5,100	1,000	Tr													6,100
	Payette	300															300
	Twin Falls	1,000			100												1,100
	Valley	100															100
	Washington	500		10		100											610
total		11,300	2,300	20	100	100		1,100									14,920
LEY	Cassia	245			220	600	375										1,440
	Oneida	365	5				400			100							870
	Power	150			5												155
	Twin Falls	175			400												575
total		935	5		625	600	775			100							3,040
HO	Bannock								760								760
LS	Bear Lake	320							40								360
	Bingham	4,100			50												4,150
	Blaine	100															100
	Bonneville	50				40											90
	Butte	5,000				1,500											6,500
	Caribou				50	65			1,340		10						1,465
	Clark	1,280			690	3,360	1,280										6,610
	Custer					2,000											2,000
	Franklin	320							1,000								1,320
	Fremont	320				120											440
	Jefferson	80			640	640											1,360
	Madison	10				10											20
	Power	50															50
	Teton	15															15
total		11,645			1,430	7,735	1,280		3,140		10						25,240
MON	Custer	50			500	40											590
	Lemhi	100			1,000	160											1,260
total		150			1,500	200											1,850
SHONE	Blaine	350			1,000				700								2,050
	Camas	200			700	10									500		1,410
	Elmore	140			100									25			265
	Gooding	500			510									25			1,035
	Jerome	260			700									100			1,060
	Lincoln	200			2,740	90								50			3,080
total		1,650			5,750	100			700					200	500		8,900
JR	Adams	50															50
LENE	Benewah	75															75
	Bonner				20												20
	Boundary	100			10												110
	Clearwater			250	5							60	5				320
	Idaho	340		700	10						40	200	600			150	2,040
	Kootenai	50			100												150
	Latah	25		15													40
	Lewis	50		800								60	195				1,105
	Nezperce	90		1,250								40					1,380
	Shoshone	50			150												200
total		830		3,015	295						40	360	800			150	5,490
nd Total		26,510	2,305	3,035	9,700	8,735	2,055	1,100	3,840	100	50	360	800	200	500	150	59,440

Thistle includes Canadian, Scotch, Musk, and Plumeless.
Knapweed includes Diffuse, Spotted, and Russian.
Toad flax includes Dalmation and Yellow.

TABLE 2
ESTIMATED ACREAGE OF NOXIOUS WEED INFESTED IDAHO
PUBLIC LAND PROPOSED FOR CONTROL
(1985-1990) 1/

District	County	1985	1986	1987	1988	1989	1990
BOISE	Ada	8	10	10	10	10	10
	Adams	2	10	10	10	10	10
	Boise	10	10	10	10	10	10
	Canyon	0	0	0	0	0	0
	Elmore	10	10	10	10	10	10
	Gem	0	0	0	0	0	0
	Owyhee	20	20	20	20	20	20
	Payette	0	0	0	0	0	0
	Twin Falls	40	40	40	40	40	40
	Valley	0	0	0	0	0	0
	Washington	50	30	30	20	20	20
Subtotal		140	130	130	120	120	120
BURLEY	Cassia	235	250	250	250	250	175
	Oneida	85	95	95	90	90	90
	Power	25	30	30	25	25	25
	Twin Falls	100	100	100	90	90	75
Subtotal		445	475	457	455	455	365
IDAHO	Bannock	760	760	760	760	760	760
FALLS	Bear Lake	360	360	360	360	360	360
	Bingham	100	200	200	200	200	200
	Blaine	20	50	50	50	50	50
	Bonneville	10	50	50	50	50	50
	Butte	500	1,000	1,500	1,500	1,500	1,500
	Caribou	1,425	1,425	1,425	1,425	1,425	1,425
	Clark	200	2,300	2,300	2,300	2,300	2,300
	Custer	500	1,000	1,500	1,500	1,500	1,500
	Franklin	1,400	1,400	700	700	700	700
	Fremont	20	30	30	30	30	300
	Jefferson	10	50	50	50	50	500
	Madison	0	0	0	0	0	0
	Power	20	50	50	50	50	500
	Teton	0	0	0	0	0	0
Subtotal		5,325	8,675	8,975	8,975	8,975	8,975
SALMON	Custer	40	40	40	40	40	20
	Lemhi	160	160	160	160	160	50
Subtotal		200	200	200	200	200	70
SHOSHONE	Blaine	600	600	600	600	600	600
	Camas	400	400	400	400	400	400
	Elmore	50	50	50	50	50	50
	Gooding	500	500	500	500	500	500
	Jerome	300	300	300	300	300	300
	Lincoln	500	500	750	750	750	1,000
Subtotal		2,350	2,350	2,600	2,600	2,600	2,850
COEUR	Idaho	232	50	60	340	100	200
D'ALENE	Nezperce	0	80	200	0	160	40
	Lewis	40	120	40	0	40	40
Subtotal		272	250	300	340	300	280
Grand Total		8,732	12,080	12,662	12,690	12,650	12,660

1/ Limited to funding available.

TABLE 3
ACRES OF NOXIOUS WEEDS TREATED ON
IDAHO PUBLIC LAND
(1978-1983)

District	County	1978	1979	1980	1981	1982	1983	Total Acres
BOISE	Ada	0	10	0	0	0	3	13
	Adams	0	0	0	0	0	3	3
	Boise	0	0	0	0	0	6	6
	Canyon	0	0	0	0	0	0	0
	Elmore	5	5	10	10	5	5	40
	Gem	0	0	0	0	0	0	0
	Owyhee	1	1	1	1	0	22	26
	Payette	0	0	0	0	0	0	0
	Twin Falls	0	24	44	40	36	40	184
	Valley	0	0	0	0	0	0	0
	Washington	10	10	10	10	45	78	163
Subtotal		16	50	65	61	86	157	435
BURLEY	Bannock	NA 1/	NA	NA	7	0	150	157
	Caribou	NA	NA	NA	27	113	4	144
	Cassia	NA	NA	117	167	200	193	677
	Oneida	NA	NA	68	90	0	39	197
	Power	NA	NA	5	12	24	8	49
	Twin Falls	NA	NA	100	97	97	100	394
Subtotal		NA	NA	290	400	434	494	1,618
IDAHO FALLS	Bannock	550	550	660	660	210	560	3,190
	Bear Lake	20	0	0	0	40	1	61
	Bingham	0	0	0	9	15	15	39
	Blaine	0	0	0	0	0	0	0
	Butte	0	29	20	50	30	30	159
	Caribou	66	0	133	302	117	304	922
	Clark	25	25	25	25	35	10	145
	Custer	0	19	20	0	27	0	66
	Franklin	76	0	0	0	40	15	131
	Fremont	0	0	0	10	10	10	30
	Jefferson	0	0	0	0	0	10	10
	Madison	0	0	0	0	0	0	0
	Power	0	0	0	0	0	0	0
	Teton	0	0	0	10	10	0	20
Subtotal		737	623	858	1,066	534	955	4,773
SALMON	Custer	Less than 10 acres per year (R/W only).						
	Lemhi	Less than 10 acres per year (R/W only).						
SHOSHONE	Blaine	100	100	100	400	400	400	1,500
	Camas	100	100	100	0	100	100	500
	Elmore	0	0	0	50	50	50	150
	Gooding	50	50	100	300	300	400	1,200
	Jerome	100	100	200	300	300	300	1,300
	Lincoln	150	150	100	0	0	50	450
Subtotal		500	500	600	1,050	1,150	1,300	5,100
COEUR D'ALENE	Idaho	0	87	66	76	37	261	527
	Lewis	40	0	20	0	40	0	100
	Nezperce	174	0	210	0	288	0	672
Subtotal		214	87	296	76	365	261	1,299
Grand Total		1,467	1,260	2,109	2,653	2,569	3,167	13,225

1/ NA - Not Available

TABLE 4
IDAHO BLM NOXIOUS WEED CONTROL PROGRAM - 1985 1/

District	County	Target Species	Acres of Treatment	Proposed Herbicide	Method of 2/ Application	Time of Application
BOISE	Ada	Thistle 3/, White top	8	2,4-D, Banvel	GV-h	Spring-Fall
	Adams	Yellow starthistle	2	Tordon	H	
				Tordon beads	Hs	Spring
	Boise	Skeletonweed	10	2,4-D, Banvel	GV-h	Spring-Summer
		Thistle				
	Elmore	Thistle, Knapweed 4/	10	2,4-D, Banvel	GV-h, b	Spring-Summer
	Owyhee	Thistle, Knapweed	20	2,4-D, Banvel	GV-h	Spring-Summer
	Twin Falls	Knapweed	40	2,4-D, Banvel	GV-h, b	Spring-Summer
		Thistle	60	Banvel	GV-h, b	Spring-Summer
	Washington	Leafy spurge,				
		Yellow starthistle,	50	Tordon	GV-h	Spring, Summer
		Thistle		Banvel	H	Fall
				Weedmaster 5/	H, Hs	
Subtotal			200			
BURLEY	Cassia	Leafy spurge	200	Banvel/2,4-D mix	GV-h, b	Spring, Summer
		Thistle	20	Banvel	GV-h, b	Spring, Summer
		Black henbane	20	Tordon	GV-h, b	Spring, Summer
	Oneida	Thistle	60	Banvel	GV-h, b	Spring, Summer
		Black henbane	40	Tordon 22K	GV-h, b	Spring, Summer
	Power	Thistle	20	Banvel	GV-h, b	Spring, Summer
		Knapweed	5	Banvel/2,4-D mix	GV-h, b	Spring, Summer
	Twin Falls	Thistle	20	Banvel	GV-h, b	Spring, Summer
		Knapweed	60	Banvel/2,4-D mix	GV-h, b	Spring, Summer
Subtotal			445			
IDAHO	Bannock	Dyers woad	760	2,4-D/Banvel mix	Hel; GV-h, b	Spring-Summer
FALLS	Bear Lake	Dyers woad	40	2,4-D/Banvel mix	GV-h,b	Spring-Summer
		Thistle	320	Tordon	Hel; GV-h,b	Spring-Summer
	Bingham	Knapweed	50	2,4-D/Banvel mix	GV-h, b	Spring-Summer
		Thistle	50	2,4-D/Banvel mix	GV-h, b	Spring-Summer
	Blaine	Thistle	20	2,4-D/Banvel mix	GV-h, b	Spring-Summer
	Bonneville	Leafy spurge	10	Tordon	GV-h	Spring-Summer
	Butte	Thistle	250	2,4-D/Banvel	Hel	Spring-Summer
		Leafy spurge	250	Tordon	GV-h, b	Spring-Summer
	Caribou	Dyers woad	1,340	2,4-D/Banvel mix	Hel; GV-h, b	Spring-Summer
		Leafy spurge, Knapweed,				
		Thistle	20	2,4-D/Banvel	GV-h	Spring
		Thistle	20	Tordon	GV-h	Spring
		toad flax	85	Tordon	GV-h, b	Spring-Summer
	Clark	Leafy spurge	200	Tordon	GV-h, b	Spring-Summer
	Custer	Leafy spurge	500	Tordon	Hel; GV-h, b	Spring-Summer
	Franklin	Dyers woad & Thistle	1,375	2,4-D/Banvel	Hel; GV-h, b	Spring-Summer
	Fremont	Leafy spurge	20	Tordon beads	GV-h	Spring
	Jefferson	Leafy spurge	10	Tordon beads	GV-h	Spring
	Power	Thistle	20	2,4-D/Banvel	GV-h	Spring
Subtotal			5,340			
SALMON	Custer	Leafy spurge	40	Tordon	GV-h, b	Spring-Summer
	Lemhi	Leafy spurge	160	2,4-D, Weedmaster	GV-h, b	Spring-Summer
Subtotal			200			
SHOSHONE	Blaine	Dyers Woad	700	2,4-D/Weedmaster	GV-h, b	Spring-Summer
		Knapweed	300	2,4-D/Weedmaster	GV-h, b	Spring-Summer
	Camas	Knapweed	300	2,4-D/Weedmaster	GV-h, b	Spring-Summer
	Elmore	Thistle	100	2,4-D/Weedmaster	GV-h, b	Spring-Summer
	Gooding	Knapweed	150	2,4-D/Weedmaster	GV-h, b	Spring-Summer
		Thistle	150	2,4-D/Weedmaster	GV-h, b	Spring-Summer
	Jerome	Water hemlock	60	2,4-D/Weedmaster	GV-h, b	Spring-Summer
		Thistle	240	2,4-D/Weedmaster	GV-h, b	Spring-Summer
	Lincoln	Knapweed	150	2,4-D/Weedmaster	GV-h, b	Spring-Summer
		Thistle	200	2,4-D/Weedmaster	GV-h, b	Spring-Summer
			2,350			
COEUR	Idaho	Yellow starthistle	200	Tordon	Hel	Spring
D'ALENE		Yellow starthistle	10	Tordon	GV-h	Spring
		Teasel	40	Tordon	Hel	Spring
		Thistle	7	Tordon	GV-h	Spring
	Lewis	Yellow starthistle	40	Tordon	Hel	Spring
Subtotal			297			
Grand total			8,832			

1/ Limited to funding available.
2/ GV - Ground vehicle; h - handgun; b - boom spray; H - backpack handspray; Hs - hand spread beads; Hel - helicopter.
3/ Thistle includes Canadian, Scotch, Musk, and Plumeless.
4/ Knapweed includes Diffuse, Spotted and Russian.
5/ Weedmaster is a commercial mix of 2,4-D and Banvel.

SUMMARY OF BUFFER ZONE REQUIREMENTS

Practice	Restriction
Helicopter	200' unsprayed buffer zone near significant aquatic resource.
	500' unsprayed buffer zone near inhabited dwellings.
Vehicular mounted boom sprayers	Not allowed in riparian areas where noxious weeds are closely intermingled with trees and shrubs, etc.
	No application in riparian areas when surface wind speeds exceed 4 mph.
	No application within 25' of a significant aquatic resource.
Hand Application	No application near a significant aquatic resource if surface wind speeds exceed 4 mph.
	No granular picloram application within 100' of a significant aquatic resource.
Wipe Application	No application of 2,4-D ester within 100' of a significant aquatic resource.
General restriction for 2,4-D ester	No use within 100' of a significant aquatic resource.
General restrictions for picloram	No use within 25' of a significant aquatic resource.
	No use within 100' of a significant aquatic resource March 1 - April 15 to reduce impacts to trout.

TABLE 5
OPTIMUM PHENOTYPIC GROWTH STAGE AND MONTH(S) FOR TREATMENT
OF WEEDS WITH SPECIFIC HERBICIDES AND RANGE OF APPLICATION RATES

Growth stage and herbicide application rate in lbs.acid equivalent/acre.

Weed Specie	2,4-D amine	Banvel	Tordon	Amitrol-T	Tank mix 2,4-D & Banvel	Tank mix 2,4-D & Tordon	2,4-D ester	Roundup	Rodeo	Tordon Beads
Buffalo bur (Solanum roatratum)			When plants are actively growing. (May-Aug) 1/4-1/2 lb/ac		When plants are actively growing. (May-Aug) 1 1/2 lbs 2,4-D + 1/2 lb Dicamba/ac			When plants are actively growing (May-Aug) 1 1/2-3 1/2 lbs/ac		
Canada thistle (cirsium arvense)		Rosette stage in fall or early bud stage in spring to maturity. (May-Sept) 2-6 lbs/ac	Bud to maturity. (May-Sept) 1-2 lbs/ac	Bud to bloom. (May-Sept)	Early bud stage or maturity. (May-June or Aug-Sept) 1/2-2 lbs Banvel + 1-3 lbs 2,4-D/ac	Bud to maturity. (May-Sept) 1/4-1 lb Tordon + 1/2-2 lbs/ac 2,4-D			Actively growing beyond bud stage. (June-Aug) 1 1/2-2 1/4 lbs/ac	Any time shortly before or during normal growing season when adequate moisture is available to carry product into soil. (April-Sept) 2-3 lbs/ac
Diffuse Knapweed (Centaurea diffusa)			Spring or wheo weeds are actively growing. (May-Aug) 1/2-2 lbs/ac		When plants are actively growing. (May-Aug) 1/2 lb Banvel + 1 1/2 lbs 2,4-D/ac					
Dyers woad (Isatis tinctoria)	Rosette stage to 4 inch elongation of flowering stalk. (Mar-June) 1 1/2 lbs/ac	Early growth stage to flowering. (Mar-June) 4 lbs/ac	Rosetta stage to 4 inch elongation of flowering stalk. (Mar-June) 1/4 lb/ac		Early growth up to flowering. (Mar-June) 1/2 lb Banvel + 1 1/2 lbs 2,4-D/ac		Rosette stage to 4 inch elongatioo of flowering stalk. (Mar-June) 1-1 1/4 lbs/ac			
Blackhenbane (Hyoscyamus niger)		When plants are actively growing before flowering. (Mar-June) 1/2-3/4 lb/ac	Plants actively growing before full bloom stage. (Mar-July) 1/4-1/2 lb/ac							
Leafy spurge (Euphorbia esula)	Early bud stage to maturity. (May-Nov) 1-2 lbs/ac	Bud to maturity. (May-Nov) 2-4 lbs/ac	Bud to maturity. (May-Nov) 1/2-2 lbs/ac		Bud to maturity. (May-Nov) 1 1/2-3 1/2 lbs/ac	Bud to maturity. (May-Nov) 1/4-1 lb Tordon + 1/2-2 lbs/ac 2,4-D	Bud to maturity. (May-Nov) 2-4 lbs/ac			Any time shortly before or during normal growing season when adequate moisture is available to carry product into soil. (April-Sept) 2-3 lbs/ac
Musk thistle (Carduus outans)	Actively growing. (May-Sept) 1-2 lbs/ac	Actively growing. (May-Sept) 1/2-1 lb/ac	Rosette stage in fall or before flowering atalk lengthens in spring. (May-Nov) 1/4-1 lb/ac		When plants are actively growing. (May-Sept) 1/8-1/2 lbs Banvel + 3/8-1 1/2 lbs 2,4-D	Actively growing. (May-Sept) 1/4-1 lb Tordon + 1/2-2 lbs 2,4-D	Actively growing. (May-Sept) 1-2 lbs/ac			
Russian Knapweed (Centaurea repens)			Wheo plants are actively growing. (May-Oct) 1/2-1 lbs/ac		When plants are actively growing. (May-Oct) 1/2 lb Banvel + 1 1/2 lbs/ac 2,4-D				Apply when actively growing from late bud to early flowering. (June-July) 3 lbs/ac	Any time shortly before or during normal growing season when adequate moisture is available to carry product into soil. (April-Sept) 2-3 lbs/ac
Scotch Thistle (Onopordon acanthium)	Active growth. (May-Sept) 1/2-1 lb/ac	Active growth. (May-Sept) 1/2-1 lb/ac	When plants are ectively growing. (May-Sept) 1/4-1 lb/ac		When plants are young to flowering. (May-Aug) 1/2 lb Banvel + 1 1/2 lbs/ac 2,4-D		Active growth. (May-Sept) 1-2 lbs/ac			
Spotted Knapweed (Centaurea maculosa)		Start of growth thru flowering. (May-July) 4 lbs/ac	Start of growth thru flowering. (May-July) 1/4 - 1/2 lb/ac		Start of growth thru flowering. (May-July) 1 lb Banvel + 3 lbs/ac 2,4-D					
White top (Cardaria darba)	Vigorous spring growth to early bloom. (May-July) 4 lbs/ac		Spring growth to bloom. (May-July) 1 lb/ac	Spring growth to bloom. (May-July) 4 lbs/ac						
Yellow starthistle (Centaurea solstitialis)			Small rosette stage well before bolting. (April-June) 1/8-1/4 lb/ac							
Yellow toad flax (Linaria vulgaris)			Active growth. (Juoe-Aug) 1-2 lbs/ac							
Hounds tongue* (Cynoglossum officinale)	Early growth to bud stage. (May-July) 1-2 lbs/ac									
Plumeless thistle* (Carduus acanthoides)		When plants are actively growing. (May-Sept) 1/2-1 lb/ac	When plants are actively growing. (May-Sept) 1/4-1/2 lb/ac		When plants are actively growing. (May-Sept) 1/4-1/2 lb Banvel + 3/4-1 1/2 lbs/ac 2,4-D					Any time shortly before or during normal growing season when adequate moisture is available to carry product into soil. (April-Sept) 2-3 lbs/ac
Dalmation toad flax (Linaria dalmatica)		Bosatte stage. (May-June) 1-2 lbs/ac	Active growing period. (May-Sept) 1-1 1/2 lbs/ac							
Common crupina							When plants are actively growing. (April-Sept) 2 lbs/ac			
Teasel (Dipsacus sylvestris)		1/4-1 1/2 lbs/ac								
Mediterraneao sage* (Salvia aethiopis)							When pleots are actively growing. (April-Sept) 2 lbs/ac			
Skeleton weed (Lygodesmis juncea)		Active Growth (May-July) 4 lbs/ac								
Water hemlock (Cicuta spp.)		Active Growth (May-July) 4 lbs/ac								
							Wheo pleots are actively growing. (May-Aug) 2 lbs/ac			

*Not on Idaho official list

3. Hand Application Methods for Liquid and Granular Formulations - Liquid formulations such as picloram (Tordon), dicamba (Banvel), 2,4-D ester or amine mix, picloram (Tordon) and 2,4-D amine mix, dicamba (Banvel) and 2,4-D ester or amine mix, glyphosate (Rodeo and Roundup) can be applied with backpack-mounted hand sprayers. This type of hand sprayer is equipped with a single low volume (30-40 psi) nozzle. Spray would be applied at .5 to 2.5 feet above the ground when surface wind velocity is below 8 mph, except near a significant aquatic resource, where treatment would be conducted when velocity is below 4 mph.

   Granular formulations of picloram (Tordon) can be applied by hand, using whirl-plate spreaders or shaker type granular applicators. Application of granular herbicide formulations with spreaders or shakers would be made at approximately 3.5 feet above the ground surface. Granular Picloram or 2,4-D ester would not be used within 100 feet of a significant aquatic resource.

4. Wipe Application Methods for Liquid Formulations - Liquid formulations of picloram (Tordon), glyphosate (Rodeo or Roundup), dicamba (Banvel), 2,4-D amine, may be used near water and other aquatic sites, particularly environmentally sensitive areas where weeds overhang waterways. However, 2,4-D ester would not be used within 100 feet of a significant aquatic resource. The herbicide solution would be wiped on the individual plants to be controlled. This method would be used up to the existing water line.

B. Herbicide Application Rates - Table 6 presents specific application information regarding each herbicide formulation. They would be applied in accordance with EPA approved label recommendations. Tank mix application rates would not exceed the maximum rate allowed for the individual herbicide. Where effective, lesser rates may be applied.

C. Time of Application - To achieve optimum control of noxious weeds treated, the growth stage of the plant must be taken into consideration. For the noxious weed species considered in this report, treatments during early growth stages (rosette to bud) are best. Table 5 indicates the optimum phenotypic growth stage for treatment of the weed species proposed for control in Idaho.

   In non-riparian zones, depending upon the characteristics of the target weed species and herbicide used, treatment can be successful any time from May through September. In riparian zones (near perennial, ephemeral and still waters) potential treatment times may not correlate with the optimum plant growth stage because of high water and other environmental concerns. Weed treatment operations using application techniques other than the wipe application method will not be conducted directly along any stream until runoff is over and waters recede to normal levels.

D. Mitigating Measures

   The following mitigating measures have been developed to reduce or eliminate impacts on the environmental components identified. They have been incorporated into the proposed action and all alternatives where applicable. Mitigating measures listed under one environmental component may also mitigate impacts on other components.

Air Quality

1. Liquid formulations of herbicides, applied with backpack, would be applied with low pressure sprayers to minimize wind drift.

2. To avoid wind drift and volatilization, aerial applications would proceed only if surface wind velocity is less than 8 mph and vegetation free of snow/ice and air turbulence does not interfere with normal spray patterns.

3. Liquid aerial applications would be made using a nozzle to limit wind drift.

4. Spray applications would be restricted to cooler periods of the day to reduce thermal influences on volatility and spray drift.

Soil

1. On steep (60%) slopes, eroded streambanks, herbicides would not be applied to noxious weed infestations that are within 10 feet of streambank interface vegetation unless hand application method is used. Glyphosate would only be applied where very selective treatment can be done. Where non-target affects may be significant, wiping would be used. Removal of non-target vegetation in these areas would contribute to severe erosion. If hand application is not used the weeds would be controlled by physical methods or wiping.

2. Safety precautions would be taken to reduce the risk of accidental herbicide spill and minimize the chance of soil sterility.

3. Treated soil would not be moved from treatment sites within 30 days after spraying.

Water

1. Herbicides will not be applied where wind currents can carry them into lakes or streams.

2. Where practicable, helicopters carrying herbicide would not cross any significant aquatic resource.

3. Picloram would not be used within 25 feet of any lake or stream.

Vegetation

1. Hand or wick application of liquid formulations, rather than backpack or boom sprayers, would be used in some riparian zones, particularly where dense stands of willows, cottonwoods, or other riparian plant species exist.

2. Aerial or vehicular herbicide would not be used in any area where threatened or endangered plants are known to exist. Control of these areas would be with backpack spray, wick application, or hand grubbing.

SAMPLE HERBICIDE FORMULATION AND REGISTRATION INFORMATION

Herbicide	Trade Name	Common Name	Chemical Name and (lbs. ac./gal) (lbs. ac./100 lbs.)	Registration Number
2,4-D amine	N/A	2,4-D amine salt	2,4-Dichlorophenoxy acetic acid (4 lbs./gal.)	464-1-AC 264-143AA
2,4-D butyl ester	N/A	2,4-D butyl ester	2,4-Dichlorophenoxy acetic acid, butyl esters (6 lbs./gal.)	464-279 264-271-AA
Banvel	Banvel	Dicamba	3,6-Dichloro -O- anisic acid (4 lbs./gal.)	876-25-AA
Tordon	Tordon 22K	Picloram	4-amino-3,5,6 Trichloropicolinic	464-323) ID-780009)
Amitrol-T	Amitrol-T	Amitrole	3-amino-1,2,4- triazole (2 lbs./gal.)	264-135-ZA
Tank mix or Weedmaster Banvel & 2,4-D	N/A	N/A	1 & 3	1 & 3 above
Tank mix Tordon & 2,4-D	N/A	N/A	1 & 4	1 & 4 above
Glyphosate	Rodeo	Glyphosate	Isopropylamine salt of N-(phosphonomethyl) glycine (4 lbs./gal.)	524-343
Glyphosate	Roundup	Glyphosate	(same as Rodeo above, except 3 lbs/gal)	524-308AA
Tordon Beads	Tordon	Picloram	4-amino-3,5,6- trichloropicolinic acid (2 lbs./100 lbs.)	464-333) ID-790025)

Fish and Wildlife

1. Except when applying herbicides, all vehicles would follow designated roads to avoid disruption of wildlife habitat.

2. Herbicides would not be applied within 10 feet of ground-nesting birds until hatch out and ground birds have left the nest, where possible.

3. Herbicides would not be applied during mating activities on the strutting/dancing grounds of sage and sharp-tailed grouse.

4. Prior to spraying any critical wildlife habitat, an evaluation would be made assessing the impacts of such an action on the species of wildlife that would be affected. A weed control method would be selected that would keep impacts to the wildlife resource within an acceptable level. Picloram would not be used within 100 feet of any significant aquatic resource during the period March 1 to April 15 to reduce impacts to trout fry.

Public Notification

1. Prior to application, weed and pest supervisors and the BLM would coordinate efforts to notify private property owners adjacent to treatment sites.

2. Developed recreation areas treated would have appropriate signs posted indicating the chemical used, date of application, and a contact number for additional information. Signs would remain in place for a minimum of two weeks after spraying.

3. Aerial application would not be made within 200 feet of property boundaries without concurrence of adjacent landowners.

Operational Procedures

In addition to the mitigating measures listed above, the following operating procedures will be followed. They are applicable to the proposed action and all the alternatives.

1. Aerial application plans must be approved by the BLM prior to application.

2. All herbicides would be applied under the guidance of an applicator licensed for herbicide application in the State of Idaho.

3. Those conducting helicopter applications would be licensed for aerial application with the Idaho Department of Agriculture.

4. Pre-spray reconnaissance flights will be conducted to orient pilots to project boundaries and sensitive areas.

5. Aerial spraying would be stopped at the end of each spray run and as the helicopter is turning to re-position for another run. Spray swaths along buffer strips would be parallel to the protected areas and would be sprayed before spraying the rest of the project area.

6. Those applying herbicides would carry copies of herbicide labels (Appendix G).

7. Herbicides mixing would be done at least 150 feet away from live water--streams, lakes, ponds, or drainage channels to prevent spills from entering any water source.

8. Care would be taken not to contaminate source water when obtaining water for herbicide mixing.

ALTERNATIVE B

(Use of All Noxious Weed Control Treatments Except the Aerial Application of Herbicides)

This alternative would be the same as Alternative A except herbicide application would be limited to ground methods. Increased use of treatments such as backpack and vehicular mounted boom spraying, and manual or mechanical methods would be made. Biological control would also be permitted in accordance with the guidelines identified in EA No. ID-81-01.

ALTERNATIVE C

(Use of Labor-Intensive Manual and Mechanical Methods, and Biological Control)

Labor-intensive methods such as: manual hand clearing, hand cutting, grubbing, and hoeing would be used to control noxious weeds along with mechanical methods such as mowing and tilling. Biological control will also be used. Independently, these actions may be successful in controlling some weeds. However, their overall success is limited, in that no single method is capable of controlling all of the noxious weeds of this program under the varied environments of the program area.

ALTERNATIVE D

(No Action)

The no action alternative allows no control efforts to be implemented to stop growth and further spread of noxious weeds. The no action alternative means that a statewide weed control agreement with the Idaho Department of Agriculture would not be completed. It may also be interpreted as a violation of the Idaho Noxious Weed Law that places primary responsibility of noxious weed control on the person, company, political entity, or Federal agency that controls the land (Section 22-2441 Idaho Code). This alternative does not meet the objectives of the proposed action.

III. DESCRIPTION OF THE AFFECTED ENVIRONMENT

Analysis has shown that the proposed weed control efforts with the specified mitigating measures would not affect the following resource components: air quality, threatened and endangered species, recreation opportunities, visual quality, wilderness areas, ACECs, wetlands, and wild or scenic river designations. They will not be discussed further.

Soil

Variations in parent material, climate, and topography, all over time, have resulted in many different soil types around the state of Idaho. These soils are confined to four geomorphic provinces: Northern Rocky Mountain; Middle Rocky Mountain; Basin and Range; and Columbia Intermountain.

The Northern Rocky Mountain group is predominant from Idaho City north to the Canadian border, and is characterized by high, massive mountains, and deeper intermountain valleys. It includes soils of the Idaho batholith, Columbia River group, and various volcanics. The Idaho batholith soils are perhaps the most unstable of those in the group.

The Middle Rocky mountain group is located, as a long narrow strip, along the Idaho-Wyoming border. It is typified by volcanic soils of the Yellowstone plateau and a complex of mountain soils in the southeastern corner of the state.

The Basin and Range soils occur in the south central portion of the state and occur generally on mountains and alluvial fans, formed in mica schist, quartzite, and alluvium with some loess influence.

Soils of the Columbia Intermountain province include soils on relatively flat, broad plains and plateaus of the Snake River, with smaller areas of mountains and deep canyon lands. They also include the Palouse hills in the western part of the state.

A new general soils map of the State of Idaho has been developed by the USDA Soil Conservation Service; publication is pending for 1985. Third order soil surveys have either been completed or are underway on most public land in Idaho. This information is available at each respective district's office.

Water

Idaho is an arid to semi-arid state with large climatic variability. Annual precipitation on the lower elevations (3000 ft.) is near 10 inches and at the higher elevations (7000 ft.) is near 40 to 60 inches with a statewide average of about 22 inches. Annual precipitation generally increases in a northerly direction for a given elevation. For the most part, annual precipitation on BLM administered (public lands) lands is below 30 inches with the majority being less than 15 inches. Seasonal precipitation varies with a winter maximum and a midsummer minimum in northern and western Idaho, while the eastern part of the state has the majority of precipitation in the spring and summer.

Idaho contains seven large river systems: the Bear, the Snake (which contains the Salmon and Clearwater), the Clark Fork-Pend Oreille, the Coeur d'Alene-Spokane, and the Kootenai. The latter four systems are in northern Idaho and have very little public land within their boundaries. The Snake River system is by far the largest in Idaho and contains most of the public land.

For the purposes of this report, the state will be described by six basins: the Upper Snake River, the Southwest Idaho basins, the Salmon, the Clearwater Basin, the Bear River basin, and the Panhandle basins. All of the basins are within the Snake River drainage except the latter two. The Snake River basins will be emphasized in this report since most of the proposed actions will occur within their boundaries. The following table illustrates the percent of water yielded as runoff from precipitation. Note that the basins in the southern part of the state yield much less water than the northern basins.

Bear River Basin	Upper Snake River Basin	Southwest Idaho Basins	Salmon Basin	Clearwater Basin	Panhandle Basin
13	19	34	39	49	55

Percent of precipitation yielded as runoff.
(Idaho Water Resources Institute, 1968)

Perennial rivers and streams on the public lands generally have average flows below 50 cubic feet per second while most are below 10 cubic feet per second. Ephemeral drainages are common to public lands especially in southern Idaho where flows oftentimes occur only during periods of snowmelt (spring runoff).

The quality of water is difficult to generalize over a large area; however, the chemical and physical characteristics can be summarized because of similar geologic and climatic conditions within a basin. Generally, waters in northern Idaho (Clearwater, Panhandle and much of the Salmon basins) are without much chemical content. Waters in these basins are typically low in calcium, carbonates, sulfates, and chlorides resulting in total dissolved constituents below 100 milligrams per liter. Most waters in these basins are protected as "special resource waters" by the State of Idaho because of their high quality and the types of use they support.

Waters in the upper Snake River Basins are of excellent quality with a slightly higher dissolved solids content than most of the northern streams. The balance of constituents and physical habitat in the upper Snake River basin has created highly productive fisheries (where pollutants or destruction of habitat have not limited the resource). The lower sections of the basin have sediment and nutrient water quality problems related to agriculture. Waters on public land generally are of excellent quality where disturbance to the stream corridor is minimal and where vegetation and soil conditions are in satisfactory condition.

The Southwest Idaho basins consist of the Boise, Payette, Weiser, Bruneau and Owyhee systems. The upper portions of the Boise, Payette, and Weiser systems are primarily on Forest Service and enter public land in the lower stretches usually in the foothills and valleys. Most of the valley land along the major perennial streams is privately owned. Therefore, in the Boise, Payette, and Weiser systems, public lands ownership of the stream corridor is limited mainly to the foothill regions and scattered tracts within the valleys. The water quality in these areas is generally acceptable for most uses, but has been degraded from the quality found in the upper watershed because of irrigation return flow, road construction, and grazing.

The Bruneau and Owyhee systems are considered arid. Public land dominates the entire drainage area. Water quality in the headwater streams is considered good. The quality within the entire system is acceptable for most use. The major water quality problem is sediment and irrigation return flow. On public lands, the major water quality problem is sediment which is naturally high but aggravated by livestock grazing, riparian vegetation destruction, and road construction.

The Bear River basin does not contain a great deal of public land. The major use of the water is for irrigation. Extensive pollution problems in the past has made the Bear River systems water quality generally poor when compared to other areas in the state. Water quality problems on public lands in this basin are similar to the Bruneau and Owyhee systems.

There are four main types of groundwater systems in Idaho: Snake River basalt, volcanic and sedimentary, older basalt, and deposits of alluvium. The largest and most important in the Snake Plain aquifer which covers most of the southern portion of the state. Water quality in the Snake Plain aquifer is good for most uses and serves as the irrigation and drinking water supply for much southern Idaho.

All of the systems occur in various parts of the state. The most common type of systems beneath public lands are the Snake River basalt, deposits of alluvium, and volcanic and sedimentary rock. The occurrence of these systems range from less than 50 feet to over 500 feet. The water quality is usually acceptable for more agricultural and domestic use where geothermal systems are not encountered. Typically the alluvial systems are the most shallow. Recharge to any of systems is considered negligible where annual precipitation is much below 10 inches. Recharge into the Snake River group is thought to be the most rapid of systems. However, any of the systems may have rapid recharge where fractures, faults, or highly porous materials are present.

Vegetation

There are three land resource regions and 15 major land resource areas in Idaho. The Northwestern Wheat and Range Region and the Western Range and Irrigated Region comprise 87 percent of BLM administered lands. Although the Rocky Mountain Range and Forest Region encompass 62 percent of all the land in Idaho, less than 2 percent is administered by BLM. Table 7 lists the major land resource areas. Range site descriptions have been written for all major land resource areas; they are on file and available at the BLM's Idaho State Office.

TABLE 7
MAJOR LAND RESOURCE AREAS AND CHARACTERISTICS IN IDAHO

Land Resource Region and Major Land Resource Area	Acres	Major Plant Species	General Habitat Type	Elevation Range (ft.)	Precipitation Zone (in.)
Northwestern Wheat and Range Region					
Palouse and Nez Perce Prairies	20,000	Wheat, barley, native pasture hay & timber.	Area suitable for dry-farm crops, high productive hay pastures. Timber production on forested mountains.	2,000 - 3,500	13 - 30
Upper Snake River Lava Plains and Hills	1,105,000	Bluebunch wheatgrass, big sagebrush, medusahead and chestgrass, ponderosa pine, Douglas fir, and spruce.	Three-fourths is used for range; one-fifth in forests. Five percent is used for row crops, small gains hay, and pasture. Higher rainfall areas are used for farming.	1,300 - 6,500	11 - 28
Snake River Plains	1,166,000	Idaho fescue, bluebunch wheatgrass, sagebrush, shadscale, and winterfat.	The vegetation is mostly sparse sagebrush and bunchgrass. Forage production is low. Cheatgrass has invaded large areas. Shadscale and winterfat grow in most mesic areas.	2,000 - 3,000	7 - 12
Big and Little Wood River Footslopes and Plains	836,000	Idaho fescue, big sagebrush, pine, spruce, and fir.	The majority of the area is suited for grazing. Very little lumbering occurs.	4,000 - 7,000	12 - 25
Central Snake River Plains	910,000	Big sagebrush, bluebunch wheatgrass, and chestgrass.	Vegetation is mostly big sagebrush and bluebunch wheatgrass. Forage production is low. Chestgrass has invaded large areas.	3,000 - 4,000	8 - 12
Upper Snake River Plains	1,400,000	Bluebunch wheatgrass, big sagebrush, basin wildrye, chestgrass, shadscale, needle-and-thread grass, and Indian rye grass	Forage production is low; majority of rangeland is grazed by livestock. Areas of bare lava have some grazing value.	4,300 - 5,000	8 - 14
Lost River Valley and Mountains	1,912,000	Low sagebrush, big sagebrush, bluebunch wheatgrass, Sandberg's bluegrass, needle-and-thread grass, and Indian rye grass.	Large valleys deeply mantled by recent alluvium and some lacustrine deposits.	4,500 - 10,000	7 - 11
Eastern Idaho Plateaus	1,038,000	Mountain big sagebrush, bluebunch wheatgrass, Idaho fescue, low sagebrush, mountain mahogany, aspen, Douglas fir, and snowberry.	Ten percent of the area consists of high mountain slopes and produces timber. The remainder is rangeland.	4,500 - 6,500	12 - 25
Western Rangea and Irrigated Region					
Owyhee High Plateau	2,695,000	Wyoming big sagebrush, bluebunch wheatgrass, Idaho fescue, Utah juniper, curlleaf mountain mahogany, western juniper.	The majority of the area is suited for grazing on open sagebrush/grass types. Open forests of juniper and mountain mahogany on high mountain slopes furnish grazing for livestock and large game.	3,500 - 7,500	8 - 16
Great Salt Lake Area	334,000	Bluebunch wheatgrass, Idaho fescue, antelope bitterbrush, big sagebrush, basin wildrye, and Utah juniper.	Sagebrush, juniper, and bunchgrasses cover much of the area; desert shrubs in dry basins provide some winter grazing for wildlife. Open mountains on high mountains supply summer grazing and small amounts of timber.	4,000 - 6000 to 10,000	10 - 16
Rocky Mountain Range and Forest Region					
Northern Rocky Mountains	350,000	Douglas fir, western white pine, lodgepole pine, ponderosa pine, snowberry, bluebunch wheatgrass, big sagebrush, Idaho fescue, and bluegrasses.	Forests of western white pine, lodgepole pine, etc., cover much of the high and intermediate elevations. This major land resource produces timber, wildlife habitat, and recreation. On lower mountain slopes, forests are open. Ponderosa pine and Douglas fir, with an understory of shrubs and grasses cover these areas. These open forests provide grazing for livestock, as well as timber and habitat for wildlife. Mining is also an important use of this area.	3,000 - 8,000 to 10,000	20 - 50
Northern Rocky Mountain Valleys; Central Idaho Rocky Mountains; and Idaho Panhandle Rocky Mountains	339,800	Lodgepole pine, ponderosa pine, Douglas fir, grand fir, and western larch.	About half of this area is forested. The area is suitable for wildlife habitat. Very little of this area is grazed by livestock.	1,800 - 3,000	20 - 33
Wasatch and Uinta Mountains	16,000	Big sagebrush, basin wildrye, bluebunch wheatgrass, mountain mahogany, rocky mountain juniper, Douglas fir, and ponderosa pine.	High ridges and mountain tops are in alpine meadow. Intermediate slopes are open woodlands of ponderosa pine, and Douglas fir with an understory of shrubs and grasses. The open woodlands, sagebrush/grasslands, and meadows provide summer grazing for livestock	5,500 - 8,000	15 - 30

Fish and Wildlife

Fish and wildlife habitat found on Idaho's public lands varies widely from high mountains to low deserts, and from small streams and reservoirs to large rivers and lakes. The fish and wildlife species found in these varied habitats are numerous and highly diverse. Wildlife populations include big game, small game, upland game, waterfowl, raptors, and fish.

Detailed information on locations, population numbers, and habitat requirements is available from the individual district offices.

Cultural Resources/Natural History/Paleontology

Cultural resources can be identified through the study of written records, oral traditions, physical remains, and vegetation and soil changes caused by human use. Included with the cultural resources are socio-cultural use areas which refers to the use of an object (including flora and fauna) or place, based on a social or cultural group's perception that the object or place has utility in maintaining the groups heritage or its existence.

The natural history resources include both geographic and vegetative features which are suitable for special designation and management. The special designations include national natural land marks, research natural areas, and natural areas. The paleontology resources are physical remains of past flora and fauna preserved in the geologic structure.

IV. ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

Impacts of the Proposed Action

Introduction

Implementation of the proposed action would result in adverse and/or beneficial impacts to the environment. Environmental components that would not be affected or do not exist in areas of proposed action, will not be addressed and include; air quality, threatened, endangered, and rare species, recreation, visual resource management, wilderness areas, ACEC's, and wild or scenic rivers.

Environmental components that may be affected by the proposed action will be discussed including; soil and water, terrestrial vegetation, fisheries, mammals, birds, and cultural and historical resources or values.

Most of the impacts anticipated from the proposed action would result from the use of herbicides. Table 8 presents a summary of the effects of herbicides on non-target variables.

Soil

With the exception of the glyphosates, the herbicides proposed for use are selective to broad-leaved plants allowing grasses to remain. Potential soil erosion resulting from the proposed action would only occur where noxious weeds and broad-leaved plants are removed. Such erosion would be insignificant and temporary until treated areas are naturally covered by grasses and forbs. Removal of solid stands of noxious weeds may result in greater short-term surface erosional losses that would be mitigated as the areas are naturally covered by grasses and forbs. Accidental spill or over application of herbicides could result in total vegetative kill or more significant soil erosion, particularly if the herbicide in question has long residual action.

Table 8 indicates the behavior in soils of the herbicides that would be used in the proposed action and Alternative B.

Water

Impacts of the proposed action to water resources are limited to increases in erosion and reduction in water quality. Erosional impacts could be caused by removal of protective vegetation cover, destruction of root system, and by physical disturbance to the soil surface. Water quality reductions could be related to increased suspended sediment concentrations, from erosion, increased sediment available for transport, increases in herbicide concentration, and increases in temperature. These impacts will be discussed in greater detail later.

The proposed action may control noxious weeds on 8,832 acres of public land in 1985. The precise locations of the proposed weed control actions are not known in great detail. The types of weed control actions are known relative to the types of weed infestations and the likely methods of treatment, most of which would be herbicidal. Of the 8,832 acres to be controlled in 1985, less than five percent would be less than 100 feet from a significant aquatic resource, at least 30 percent may be on slopes greater than 10 percent, and all of the acreage could be above a groundwater resource. These locales are pointed out because these areas are most sensitive to adverse impacts that may be caused by the proposed action.

TABLE 8
EFFECTS ON NON-TARGET SPECIES

Active Ingredient/ Common Names	Likely Application rates mg/m2	Toxicity/ Persistence	Vegetation	Livestock	Fish	Wildlife	Behavior in Soil, Water, Air
2,4-D	50 - 450 mg/m2	Low to moderate toxicity. Non-bioacculative. HL less than a month.	Harmful to many crops, may harm confiers, sage-brush, broad-leafs, rabbit-brush, buck-brush, snow-berry.	50 mg/kg/day. No effect (amine) 250 mg/kg/day. Lethal to some (ester). Allowable residue for hay = 300 ppm for rangeland grasses = 1,000 ppm.	Toxic at 1-60 ppm (butyl ester).	Toxic to some birds at 400 mg/kg. Relatively non-toxic to bees.	Degradability in soil dependent on microbial activity. Fast in organic and moist soils. Much slower in dry soils. Persistence in water depends on microrganisms. Concentration usually below 100 ppb. Butyl ester has high volatility. Drift problems can occur.
Amitrole/ Amitrole, Weedozol,	450 mg/m2	Low toxicity. HL unknown— probably less than 6 months	Non-specific— could harm grass.	Low toxicity.	Low toxicity to fish. Toxic to some micro-invertebrates.	Low toxicity. Relatively non-toxic to bees.	Reversibly absorbed, leachable in sandy soil, reduced in clay soils.
Dicamba/ Banvel	50 - 450 mg/m2	Slightly toxic. HL less than 3 months. Not bioassumulative.	Toxic to many trees, shrubs, forbs. Varies considerably.	No information. Allowable residue hay 40 ppm. Allowable residue hay 40 ppm. Allowable rangeland grasses 40 ppm.	Toxic at 24 ppm, LC50 trout. Other fish around 100 mg/e.	Toxic to some birds (pheasants) 800 mg/kg (LD50). Rabbits-556 mg/kg. Rats 1000 mg/kg (LD50). Relatively non-toxic to bees.	Not readily absorbed by soil. Readily leached. Degradation via microbial action.
Glyphosate, Roundup, Rodeo	150 - 350 mg/m2	Slightly toxic. HL less than 2 weeks. Not bioaccumulative.	Non-selective, evergreens more tolerant.	Very Low. Allowable residue alfalfa 00.2 ppm.	Practically non-toxic to fish and most intebrates tested. May be toxic to mussels. Trout 38 ppm (TL50).	Practically non-toxic. Ducks 4000 mg/e LC50. Relatively non-toxic to bees.	Strongly absorbed by soil. Higher with organic soils. Minimum absorption in sandy soils. Decomposes rapidly by microrganisms. May produce hydrogen in contact with certain metals. Warning to applicators.
Picloram/ Tordon	50 - 200 mg/m2	Slightly toxic. Persistent HL 1-13 months possibily careinogenic.	Can be toxic, especially if persistent. Broadleaf & woody species susceptible grasses are resistant.	Very Low. Allowable residue forage grasses 80 ppm.	Low lethal toxicity to fish. Reports of reduction of survival and growth of fry at 0.035 ppm. Stonefly LC50 120 ppm.	Low toxicity. Mice LD50. 2000-4000 mg/kg.	Very stable in plants, can be leached, relatively nonvolatile. Residues have been detected after 3 years.
Prometrya/ Primitol 25E	*	Fairly persistent.	Non-selective.	May affect livestock if application exceeds 1 lb/acre.	No effect at 1 ppm.	Low toxicity. Rats LD50 2980 mg/kg. Mice LD50 2160 mg/kg.	Probably detectable in runoff. Decomposition by microbial action.
Ammonium sulfamate	*			Allowable residue information for pears and apples.			
Diesel Oil			Toxic to nontarget species. Depends on volatility.	Application of 79,000 mg/m2 would still be below expected lethal doses assumming 10% of body weight herbage consumption. Lethal dose 16,400 mg/kg to cows. Not much info.	Rainbow exposure 24 hr. +0 #2 fuel oil had an off flavor at 10 mg/l.	Ducks LD50 16,000 mg/kg Reduced hatching success at 4 mg/l because of oil on egg.	Aromatics such as benzenes may be mobile in soil. Non-aromatics tend to be absorbed and evaporate or degrade biologically.
Atrazine	*	Very persistent.	Most weeds and grasses, woody species.	Long grazing restriction, long planting restriction.			

* Not proposed for use.

HL = half life ppb = parts per billion ppm = parts per million mg/kg = milligram per killogram per day

Areas Within 100 Feet of Surface Water - Although the proposed action does not allow for aerial helicopter spray applications within 200 feet of surface water, an analysis may include an incident where herbicides from the helicopter might be applied accidentally to a segment of stream, lake, or wetland. In the event of this unlikely occurrence, herbicides would be applied directly to the water at field application rates (maximum of 2 to 4 lbs./acre). The concentration of herbicides in the water affected would be dependent upon the depth of the water (assuming a well-mixed system). For many BLM streams (average depth less than 3 inches) this concentration would be below 10 milligrams per liter of active ingredient for a given herbicide. Of the proposed herbicides for use, only the butyl-ester of 2,4-D has been reported to be lethal to fish at concentrations less than 10 milligrams/liter. In the event of a direct application to a stream of 2,4-D butyl-ester, 50 percent of the fish population could be expected to show acute toxic effects beneath the effected area. Under normal spray operations, as described by the proposed action, no herbicide is likely to reach a significant aquatic resource and no significant impact would occur.

The proposed action deals with hand treatment and mechanical removal and would not allow block removal of weeds near a significant aquatic resource. This measure reduces the impact of weed removal on non-target vegetation to a minimum, which also minimizes the potential for soil erosion or increased streambank erosion. This measure also reduces the potential for increased stream temperatures because of the loss of shade producing vegetation.

No significant effect to a surface water is expected from helicopter aerial spraying within 200 feet of aquatic resource or the proposed treatment areas within 100 feet of an aquatic resource from erosion, water contamination, or temperature increases.

Areas With Slopes Greater Than 10 Percent - There is a high probability that much of the proposed action on slopes greater than 10 percent will involve control of a broadleaf weed. Selective herbicide aerial application is the most likely method of control. If these areas correspond to highly erosive areas, a potential for increased soil erosion (gully and rill) exists. If these areas are not interspersed with grass species the probability of erosion damage is increased and subsequent water quality impacts may be greater.

Impacts to groundwater from the proposed action are limited to herbicide contamination of a groundwater system. Herbicides are likely to enter a groundwater system only when there is herbicide present on the vegetation or in the soil and it is picked up by water on its way through the soil profile.

For this analysis, precipitation is assumed to occur within a few days after application since most of the herbicides proposed for use have very short half-lives. Only picloram is known to be fairly persistent with a half-live between one and thirteen months. Of the proposed herbicides to be used, amitrol, dicamba, and picloram are not readily absorbed by the soil. These herbicides would be most likely of reaching a groundwater system, given sufficient precipitation.

In arid areas (most of the BLM lands) precipitation is not sufficient to produce aquifer recharge. These areas would not have groundwater impacts from herbicides. In higher elevations where precipitation is greater than 10 or 12 inches some recharge may occur. These areas may have enough groundwater percolation to transport herbicide residues.

The only information examined concerning herbicide movement in soil involved dicamba and picloram. Field applications of dicamba produced soil concentrations of 150 part per million (ppm) that declined to less than 1 ppm during an 11-month period. Residues of 1 part per billion (ppb) were detected at depths of 2.4 meters (DOE, 1983). However, the risk of groundwater contamination is negligible because of microbial activity, hydrolism, and deep water tables.

A study of picloram found the highest concentrations in the upper 12 inches of soil (DOE, 1983). No other information concerning the transport of these herbicides in soil was found in the literature.

Assuming that the dicamba study represents typical behavior of the other two herbicides, concentrations of any of the proposed herbicides reaching a groundwater system would be small from BLM proposed operations. Once in the system continued degradation and dilution would take place. Concentrations would be expected to be several magnitudes of order below toxic levels measured in test animals. Water quality standards for the three herbicides have not been established.

The proposed action will have a positive impact by reducing the number of noxious weeds along waterways, which serve as an agent in seed dispersal.

Vegetation

Terrestrial vegetation is the environmental component that will be most affected by the proposed weed control program. Treatment of noxious weeds will impact both target and non-target vegetation.

The proposed herbicides, excluding amintrol and the glyphosates, are selective, affecting broad-leaved plants and not grasses. Glyphosates are broad spectrum, non-selective herbicides that affect most perennial plants, annual and biennial grasses, sedges and broad-leaved plants.

Table 8 lists the effects of the various herbicidal active ingredients on terrestrial vegetation. The glyphosate herbicides are the most non-selective and will therefore result in the most non-target vegetative loss. Because of this, glyphosate use will be restricted to ground application. For the other chemicals, the broad-leaved plants will be the non-target group primarily affected. Plants such as rabbit-brush, greasewood, mountain mahogany, various sagebrush species, willows, aspen, and numerous forbs which are in or near treatment sites will be weakened or destroyed.

The extent of any non-target vegetation loss would be contingent on the proximity of desirable species to treated weeds, the method of herbicide application and the herbicides used. Non-target kill is expected to be the greatest in areas where the helicopter is used. Buffer zones and specific application methods (backpack sprayer, hand application of beads, and truck mounted boom and hand gun) should help minimize non-target kill.

Most grass species are resistant to applications of the recommended rates of Tordon, Banvel, and 2,4-D amine and ester formulations. Grasses should become more abundant after implementation of the proposed action as plant competition is reduced.

Over application or accidental spill of any of the proposed herbicides could weaken or destroy grasses and broad-leaved plant species.

Fish and Wildlife

Fish

Dicamba (Banvel), glyphosate, and 2,4-D amine are the only herbicides proposed for use within 25 feet or a significant aquatic resource (see herbicide application methods). In addition, picloram will not be used within 100 feet of any significant aquatic resource from March 1 to April 15. Trout are one of the more sensitive species to herbicides, picloram in particular. No-effect levels of picloram are 0.29 ppm for trout fry (Woodward, 1979). The user restrictions in the proposed action should be sufficient to eliminate any adverse impacts from picloram application. Use of dicamba, glyphosate, and 2,4-D amine as proposed should not cause any adverse effects.

Terrestrial Wildlife

Most birds and mammals are not very sensitive to the proposed herbicides (DOE, 1983). Impacts, if any, would be the destruction of non-target vegetation. The proposed action consists of helicopter or ground application of herbicides. Helicopter application is the most likely to produce large losses of non-target vegetation such as browse. The largest conceivable block aerial application of herbicides would not exceed 200 acres in size. In most instances a 200 acre removal of non-target vegetation would not be a significant impact. However, the loss of 200 acres of food or cover habitat may be significant to some wildlife populations.

The proposed action requires that herbicide application within crucial wildlife habitat be assessed and control methods selected that will keep wildlife impacts within an acceptable level. Therefore, there would be no significant impacts on wildlife populations.

The proposed action sufficiently mitigates impacts from toxicity and non-target vegetation species. No significant adverse impacts are expected with the proposed action.

Cultural Resources/Natural History/Paleontology

Mechanical control of noxious weeds has a potential of impacting the physical remains of the cultural resources when they are located on or near the surface. A cultural clearance will be required for sites where mechanical control is proposed.

Humans

A pesticide, by definition, is toxic to living organisms. Ideally, the toxic activity of a herbicide would be limited to its intended target, such as unwanted noxious weeds. The potential hazard to humans is a concern during and following any herbicide application. Consequently, it is important to assess the potential human health hazards following exposure to specific herbicides.

The following is an assessment of hazards to humans that may be exposed to herbicides used in BLM's Idaho noxious weed program. It is BLM policy to use only those herbicides registered by the Environmental Protection Agency and to follow label directions. It is assumed throughout this analysis that this policy would be followed. Assessments of hazards associated with nonlabeled uses or application rates will not be considered.

Table 9

Categories of Acute Toxicity

Toxicity Category	Signal Word	Oral LD_{50} (mg/kg)	Dermal LD_{50} (mg/kg)	Inhalation LC_{50} Dust or Mist (mg/liter)	Inhalation LC_{50} Gas or Vapor (ppm)	Eye Effect	Skin Irritation
I	Danger Poison	50 or less	200 or less	2 or less	200 or less	Irreversible corneal opacity at 7 days.	Severe irritation or damage at 72 ho
II	Warning	50 through 500	200 through 2,000	2 through 20	200 through 2,000	Corneal opacity reversible within 7 days, or irritation persisting for 7 days.	Moderate irritatio at 72 hours.
III	Caution	500 through 5,000	2,000 through 20,000	20 through 200	2,000 through 20,000	No corneal opacity, irritation reversible within 7 days.	Mild or slight irr tion at 72 hours.
IV	Caution	5,000 or greater	20,000 or greater	200 or greater	20,000 or greater	No irritation.	No irritation at 72 hours.

Adapted from U.S. Environmental Protection Agency toxicology guidelines, summarized in Ashton 1982.

Table 10

Toxicity Rating Chart for Acute Oral Doses in Man

Toxicity Rating	Classification	LD_{50} (mg/kg)	Probable Lethal Oral Dose for Average Adult Human
1	Super toxic	Less than 5	A taste (less than 7 drops)
2	Extremely toxic	5 to 49	7 drops to 1 teaspoonful
3	Very toxic	50 to 499	1 teaspoonful to 1 ounce
4	Moderately toxic	500 to 4,999	1 ounce to 1 pint (1 pound)
5	Slightly toxic	5,000 to 14,999	1 pint to 1 quart
6	Practically nontoxic	15,000 and above	More than 1 quart

Adapted from Heikes 1967; Hodge and Sterner 1949; Klaaşen and Doull 1980; and Loomis 1978.

TABLE 11
SUMMARY OF AMITROLE HAZARDS TO THE USER AND TOXICITY STUDY RESULTS

	Human Occupational Dose 1/
Mixer/Loader	0.1 mg/kg
Observer	up to 0.072 mg/kg
Backpack Sprayer	0.22 mg/kg

	Toxicity Summary
ACUTE TOXICITY	Humans Two gardoers accidentally exposed to Amitrole were reported to have eye iojuries. No information on the exposed dose levels or severity of tbe eye injuries was presented (Swift, 1976). A 39-year old woman sbowed oo signs of iotoxitation following ingestion of Amitrole at a dose of 20 mg/kg (Geldmacher-v. Mallinckrodt and Schmidt, 1970). Mice/Rats Studies sbowed acute oral LO50 in rats ranged from 1,150 to 25,000 mg/kg. LD50 = 14,700 mg/kg io mice (oral). Rabbits LD50 = 10,000 mg/kg for rabbits (Amizol to shaven skin).
SUBCHRONIC TOXICITY	Subcbronit toxitity studies show that Amitrol affects primarily tbe tbyroid gland. Humans Ho information. Mice/Rats Three studies sbowed toxit signs in rats, includiog tbyroid problems. Amitrole diets raoged from 15 to 10,000. Rabbits Cataracts were produced when Amizol was admioistered in tbe diet or drinking water at 0.2 percent concentration.
CHRONIC TOXICITY	Humans No information. Mice/Rats Two studies showed toxic effects iocluding thyroid problems in rats at dietary levels above 30ppm. One study sbowed normal thyroid glands in rats fed 50 ppm for 119 days. Rabbits No information.
REPROOUCTIVE AND TERATOGENIC EFFECTS	Humaos No informatioo. Mice/Rats Study results indicate Amitrole is oon-terstogeoic and has little or no effett on reproduttion in rats. Rabbits No information.
CARCINOGENICITY	Amitrole has been shown to be carcioogenic io animals. Humaos Evidence suggests that Amitrole may be cartinogenit for mao. Swedish railroad workers esposed to herbicides cootaining Amitrole and phenoxy acids showed an increase in stomacb tumors over the number expetted. However, tbe relationsbip between tumor iodurtion and exposure to Amitrole remains unclear, since workers were exposed to a combination of herbitides (Axelsoo and Sundell, 1974, 1980). Mite/Rats Numerous studies documeot the high incidence of tumors that developed io rats and mice after ingesting Amitrole at various levels over differeot periods of time. Rabbits Ho information.
MUTAGENICITY	The overwhelming body of data indicates Amitrole is not mutagenic. Humaos Amitrole did oot produce thromosomal aberratioos io human lymphotytes io tulture (Meretoja, 1976; Sorsa and Gripenbetg, 1976). Mice/Rats Three oegative sod ooe positive test io mite. Rabbits No information.

1/ Assumes aerial applicatioo at 1.8 lb active ingtedieot per acte sod gtouod foliar application at 4 lb active iogredieot per acre. Ottupational doses iotlude all routes of exposure (dermal, inhalation, oral). Estimates were based oo utioary output of several tategories of workers esposed to phenosy herbitides. Daily occupational expo-sure estimates fot amitrole are based on exposures on a pet pouod pet acte applitation rate multiplied by 1.8 lb/acre for observers and 5.5 lb/acre for batkpack sprayers. Aerial spray dose estimates are based upon a maximum of one daily exposure to direct dermal absorption rate is assumed.

TABLE 12
SUMMARY OF OICAMBA HAZARDS TO THE USER AND TOXICITY STUDY RESULTS

	Human Occupational Dose 1/
Mixer/Loader	0.1 mg/kg
Observer	up to 0.056 mg/kg
Backpack Sprayer	0.24 mg/kg

	Toxicity Summary
ACUTE TOXICITY	Humans Based oo acute toxicity tests, dicamba is classified as slightly toxic when ingested orally. Inhalation toxicity is a slight health hazard warranting handling with caution. Mice/Rats LO50 2,900± 800 mg/kg (acid form, oral) LD50 1,028 to 2,629 mg/kg (DMA salt form, oral) Mild skin irritation in dermal tests LC50 > 200 ppm (inhalation) LO50 > 4,600 mg/kg (acid form, oral) Rabbits LO50 566 to 2,000 mg/kg (DMA salt form, oral) Mild skin irritation in dermal tests
SUBCHRONIC TOXICITY	Humans No information. Mice/Rats Three studies showed no toxic or adverse effects on rats from dicamba exposure of 500 to 800 ppm. Four studies showed problems ranging from mild toxicity to liver and kidney problems in rats with higher doses (1,000 ppm) over longer periods of time. Rabbits No information.
CHRONIC TOXICITY	Humans No information. Mice/Rats Chronic toxicity of dicamba has been evaluated in rats and mice which received dicamba in the diet for periods up to 2 years with the highest dose inducing increased mortality and organ weight changes in mice. Continuous feeding of rats at up to 500 ppm elicited no adverse effects. Rabbits No information.
REPRODUCTIVE AND TERATOGENIC EFFECTS	Humans No information. Mice/Rats No reproductive, fertility, gestation, viability, or lactation effects were observed over three generations of rats fed 500 ppm dicamba for 3 to 4 months. Rabbits Post-implanted losses and a decreased number of live fetuses at doses of 10 and 20 mg/kg/day. No ill effects with doses of 3 mg/kg/day.
CARCINOGENICITY	Humans No information. Mice/Rats Feeding studies with dicamba have revealed no carcinogenicity in rats and mice. Rabbits No information.
MUTAGENICITY	Oicamba is not considered to be mutagenic. Humans No information. Mice/Rats No information. Rabbits No information.

1/ Assumes aerial application at 1.4 lb active ingredient per acre and ground foliar application at 6.0 lb active ingredient per acre. Occupational doses include all routes of exposure (dermal, inhalation, oral). Estimates were based on the urinary output of several categories of workers exposed to phenoxy herbitides. Daily occupational exposure estimates for dicamba are based on exposure on a per pound per acre application rate multiplied by 1.4 lb/acre for observers and 6.0 lb/acre for backpack sprayers. Aerial spray dose estimates are based upon one daily exposure to direct aerial spray with an unprotected skin surface area of 2 square feet. A 10% dermal absorption rate was used in the calculations.

TABLE 13
SUMMARY OF GLYPHOSATE HAZARDS TO THE USER AND TOXICITY STUDY RESULTS

Human Occupational Dose 1/	
Mixer/Loader	0.1 mg/kg
Observer	up to 0.016 mg/kg
Backpack Sprayer	0.20 mg/kg

Toxicity Summary	
	Glyphosate was found to be practically nontoxic in the animal species tested.
TE ICITY	Humans No visible skin changes signifying reaction to injury were found in a human irritation (patch) test (Monsanto Company, 1982). Mice/Rats LD50 > 5,000 mg/kg (rats, oral) Rabbits LD50 = 3,800 mg/kg (oral) LD50 > 5,000 mg/kg (dermal) For eye irritation - commercial products ranged from 0.0 to 18.4 on a scale from 0 to 110 (maximum irritation). For skin irritation, rodeo and glyphosate scored 0.1 while roundup scored 4.3 on a scale of 0 to 8.0 (maximum irritation).
CHRONIC ICITY	Humans Product (Roundup) does not present a skin irritation handling hazard (USDA, 1981). Mice/Rats No effects noticed from 200 to 2,000 ppm dietary levels for 90 days. Rabbits Rabbit skin irritation was found to occur with Roundup due to the surfactant in the product.
OMIC ICITY	Humans No information. Mice/Rats No adverse effects on rats at 30, 100, and 300 ppm dietary supplements for 2 years. Rabbits No information.
RODUCTIVE AND ATOGENIC EFFECTS	Humans No information. Mice/Rats No birth defects in offspring at 300, 1,000, and 3,500 mg/kg treatments. Reduced mating, fertility, and pregnancy, not considered treatment related; first litters of 2nd and 3rd generation rats fed 300 ppm diets. Rabbits No teratogenic response with 10 or 30 mg/kg body weight treatments.
CINOGENICITY	Humans No information. Mice/Rats Determined noncarcinogenic in mice and rats with up to 300 ppm dietary supplements for 18 months and 2 years respectively. Rabbits No information.
AGENICITY	Glyphosate is not a mutagen. Humans No information. Mice/Rats No effects on mice at 200, 800, or 2,000 mg/kg. Rabbits No information.

Assumes aerial application at 4 lb. active ingredient per acre and ground foliar lication at 5 lb. active ingredient per acre. Occupational doses include all tes of exposure (dermal, inhalation, oral) on a daily basis. Data are not availe on the daily occupational exposures or doses. Estimates were based on the nary output of several categories of worker exposed to phenoxy herbicides. Daily upational doses are based on exposures on a per pound per acre application rate tiplied by the appropriate concentration of active ingredient. A one percent mal absorption rate was used in the calculations.

TABLE 14
SUMMARY OF PICLORAM HAZARDS TO THE USER AND TOXICITY STUDY RESULTS

Human Occupational Dose 1/	
Mixer/Loader	0.1 mg/kg
Observer	up to 0.0076 mg/kg
Backpack Sprayer	0.40 mg/kg

Toxicity Summary	
	Picloram has low toxicity to most organisms. Humans No information.
ACUTE TOXICITY	Mice/Rats LD50: 8,200 mg/kg (rats, oral) LD50: 2,000 - 4,000 mg/kg (mice, oral) No effects from inhalation of Tordon 22K saturated atmosphere (rats). Rabbits LD50: Approximately 2,000 mg/kg (oral, dermal) Mild skin irritant; Picloram not likely to be absorbed through skin. Induces moderate eye irritation which heals rapidly.
SUBCHRONIC TOXICITY	Generally little or no effects on test animals after subchronic exposure in the diet (oral). Humans No skin irritation or sensitization with repeated dermal applications of 10% solution of Tordon 22K (Lynn, 1965). Mice/Rats No effects with 1,000 ppm (75 mg/kg body weight equivalent) in diet for 90 day period (rats). Moderate histological changes in the liver and kidneys and slight loss of body weight with 3,000 to 10,000 ppm in diet for 90 day period (rats). No effect level for rats is 50 mg/kg/day. Rabbits Slight scaling, congestion, and redness of skin with treatments of undiluted picloram daily for nine times over an 11 day period.
CHRONIC TOXICITY	No observable toxic effects were noted in dogs or rats at doses of 15 to 150 mg/kg of body weight for 2 years. The results cannot be validated because the raw data has been destroyed.
REPRODUCTIVE AND TERATOGENIC EFFECTS	Picloram appears to have little or no effect on fertility, reproduction, or development to offspring. Humans No information. Mice/Rats Three generations of rats fed the equivalent of 150 mg/kg in the diet showed no significant differences between treated and untreated rats regarding gestation, viability, lactation, weanling weights, rates or resorption of fetuses, or fetal teratogencity. Minor abnormalities in rats at 750 or 1,000 mg/kg but no terstogenesis or advsrss nsonatal development effects with treatments of up to 1,000 mg/kg/day from 6 to 15 days of gestation. No effects on fertility or numbers of offspring in mice at 15 mg/kg/day from 4 days before to 14 days after mating.
CARCINOGENICITY	Picloram appears to present little or no carinogenic risk to man (USDA, 1984). Mice/Rats Found noncarcinogenic in 2 year study at 150 mg/kg/day dose (rats). Found not carcinogenic in mals, benign liver nodules in femals at 14,875 and 7,431 ppm doses in diet for 80 weeks (rsts). Found not carcinogenic in males and females at 5,062 and 2,531 ppm in diet for 80 wasks.
MUTAGENICITY	Picloram has been tested in a variety of microbial tests and was ganerally found to be nonmutagenic. Humans No information. Mice/Rats No evidence of aytogenic effects on bone marrow cells when fed up to 2,000 mg/kg.

1/ Assumes aerial applicstion at 1.9 lb/scre and ground foliar application at 10 lb/acre. These estimates of occupational doses have been derived based on the urinary output of serveral categories of workers exposed to phenoxy herbicides. Maximum dermal absorption rate is assumed to be 1 percent. Occupational doses include all routes of exposure (dermal, inhalation, and oral) are are on a daily basis.

TABLE 15
SUMMARY OF 2,4-D HAZARDS TO THE USER AND
TOXICITY STUDY RESULTS

Human Occupational Dose 1/	
Mixer/Loader	0.1 mg/kg
Observer	up to 0.312 mg/kg
Backpack Sprayer	0.24 mg/kg

Toxicity Summary	
	2,4-D is considered moderately toxic. In general, the salts and esters have about the same toxicity as the acid in mammals. Observed effects include excessive thirst, loss of appetite, loss of weight, depression, tremors, muscular weakness, rapid breathing, and salivation. Post mortum findings include irritation to stomach, mild liver and kidney injury, and occasional lung congestion.
ACUTE TOXICITY	Humans 2,4-D ingestion or skin exposure can cause irritation to gastrointestinal track, chest pain, and muscle twitching (Mullison, 1981). A case of ingestion of an 80 mg/kg dose of dimethylamine salt caused congestion of all organs, degenerative nerve cells and death. Another case of 110 mg/kg dose of isoctyl ester caused muscle twitching and parslysis with recovery in 24 hours (Mullison, 1981). Eye injury or irritation can be caused by three common 2,4-D products (DMA4, Formula 40, Esteron 99) (Gehring and Betso, 1978 and Rowe 1952 in Mullison 1981). Excessive skin contact causes irritation, tingling of extremities, nausea, vomiting, and muscle ache and loss of function. 2,4-D is slightly toxic by inhalation exposure. Prolonged breathing causes coughing, burning, dizziness, and temporary loss of muscle coordination (Mullison, 1981). The treshold limit value for airborne concentrations for repeated exposures without adverse effects is 10 mg/m3 as set by the American Conference of Governmental Industrial Hygenists. Mice/Rats LD50: In the range of 300 to 1,000 mg/kg (oral) Rats LD50: 1,500 mg/kg (dermal) Rabbits LD50 in the range of 400 to 800 mg/kg (oral) LD50 1,400 mg/kg (dermal)
SUBCHRONIC TOXICITY	Humans Ingestion of 8 mg/kg/day for 3 weeks caused no adverse effects. Twenty-one intravenous injections of 800-960 mg over 32 days caused no adverse effect. Injection of 3,600 mg (equivalent to 51.4 mg/kg/day) caused stupor, incoordination, weak reflexes and loss of urniary control, all which returned to normal within 24 hours (Mullison, 1981). Mice/Rats Subchronic studies are currently in progress to clarify the low but measurable toxicity of 2,4-D. No effect level, rats 15 mg/kg/day. Depressed growth, excessive mortality, and increased liver weight in rats at 50 mg/kg/day. No effects with 1,000 ppm daily doses of 2,4-D amin1 salt for 10 months. Rabbits No information.
CHRONIC TOXICITY	Both the subcutaneous and oral routes of exposure can cause renal gout, stomach ulcers, anemia, and death. Humans See discussion under subchronic toxicity.
REPRODUCTIVE AND TERATOGENIC EFFECTS	Based on the studies of mammals, the threshold dose below which no teratogenic response is very high and is expected to be considerably above any potential environmental exposure. Humans No information. Mice/Rats Increased incident of fetal abnormalities in mice. Embryotoxic and fetopsthic in rats. Not teratogenic (3 studies) to potentially teratogenic (1 study). All mammals: 6 studies negative for terstogenicity; 1 study positive for teratogeneicity; 1 study potentially teratogenic.
CARCENOGENICITY	Based on long-term studies in rats, mice, and dogs, 2,4-D is a suspect carcinogen; however, there are no conclusive data demonstrating the carcenognuity of 2,4-D (International Agency for Research on Cancer, 1977; Mullison, 1981; and Minnesota Dept. of Health, 1978). Humans Human exposures to 2,4-D do not appear, based on available evidence, to produce carcinogenic effects.
MUTAGENICITY	Generally, 2,4-D has been found to be nonmutagenic in most of the microbial systems investigated (Havas, 1982; Mullison, 1981; Lommler, 1980; Minnesota Dept. of Health, 1978; Seiler, 1978; Oost, 1978; International Agency for Research on Cancer, 1977; and Fahrig, 1974). Owing to the complex physiological activities of 2,4-D on plant cells, the significance for animals and man is not clear (USDA, 1984). No conclusions about the mutagenicity of 2,4-D to human can be made.

1/ Assumes aerial application at 7.8 lb active ingredient per acre and ground foliar application at 6 lb active ingredient per acre. In the case of aerial spray observer, exposure estimates are based upon the maximum of one daily exposure to direct aerial spray with an unprotected skin surface area of 2 square feet. The maximum dermal absorption rate is assumed to be, in the absense of data to indicate otherwise, ten percent (USFS, 1984 PD-69). The doses include all routes of exposure. Toxicity analysis for 2,4-D does not include any mixtures of 2,4,5-T which is not proposed for use in this document.

All the information presented in this portion of the document dealing with the assessment of hazards to human health was referenced from:

> USDA Forest Service, 1984. Pesticide Background Statements, Volume I Herbicides. Agriculture Handbook No. 633.

To our knowledge, this is the most up-to-date literature available on the subject.

Amitrole is generally nontoxic to a variety of organisms. Studies with rodents indicate that amitrole is nonteratogenic and has little or no effect on reproduction. Amitrole has been shown to be carcinogenic in animals, and evidence shows it may be carcinogenic in man. It is nonmutagenic.

In the case of formulations in which ammonium thiocyanate have been incorporated to increase its systemic action (such as in Amitrol-T and Cytrol Amitrole-T), an increased toxicity has been observed in several species. In rats, an acute oral LD50 of ammonium thiocyanate is about 750 mg/kg body weight, while for amitrol, an acute oral LD50 in rats of as high as 25,000 mg/kg has been reported.

Dicamba is generally nontoxic to a wide variety of nontarget organisms. There is no evidence for carcinogenic or mutagenic hazard from animal studies. There is evidence of reproductive effects to rabbits.

Glyphosate is generally nontoxic to a variety of organisms. However, when formulated as Roundup, it is toxic to some animal species due to the presence of a surfactant. The surfactant is included to increase the rate of absorption of glyphosate by plants. Studies with rodents indicate that glyphosate is nonteratogenic; has little or not effect on fertility, reproduction, or development of offspring; is nonmutagenic; and appears to present no carcinogenic risk.

Picloram has low toxicity to most organisms. Studies with rodents indicate that picloram is nonteratogenic; has little or no effect on fertility, reproduction, or development of offspring; is nonmutagenic; and appears to present little or no carcinogenic risk.

Most formulations of 2,4-D are mildly toxic to mammals. Some formulations, such as salts, esters, and concentrated solutions, are eye irritants that can cause injury. Some formulations may cause irritation to the skin. Inhalation toxicity is minimal. There are no conclusive data demonstrating the carcinogenicity or teratogenicity of 2,4-D. However, several studies have indicated embryotoxic and fetotoxic effects of some formulations of 2,4-D.

Humans. There are very few people living in close proximity to the Federal lands onto which the proposed action would be carried out. Including the persons applying herbicides, it is estimated that less than one hundred persons will be exposed to the herbicides as a result of the proposed action. Chronic and subchronic effects would be unlikely since consecutive exposure

days for any person would be less than ten. The amount of herbicide exposure to any person from the proposed action will be significantly below documented human health hazard levels (USDA Forest Service, Agriculture Handbook No. 633).

In the unlikely event of exposure (i.e., accidental, direct spraying of a person) to any herbicides in the proposed action, some acute, nonlethal effects could result from all chemicals proposed for use. Such effects may include skin and eye irritations. In the case of 2,4-D, additional nonlethal effects may include nausea, vomiting, muscle ache, and temporary loss of muscle function. These symptoms would probably be short-term and disappear within 24 hours after exposure.

Short-term vs. Long-term Productivity

Implementation of the proposed weed control program will have short-term effects on the productivity of treated sites. Currently, many of these sites are used for grazing and recreation and serve as an ecological niche for wildlife. However, continued use of the land for these pursuits is contingent on future productivity. Controlling the spread of noxious weeds and encouraging management of native plant species will ensure future productivity and use of the land for grazing, recreational, and wildlife purposes.

In the short-term, the loss of target and non-target vegetation will cause temporary loss of food, cover, and other habitat requirements for wildlife and livestock. In the long range, increased vegetative productivity by grasses and forbs will result in an increased productivity of the land for livestock and wildlife. However, soil erosion, from a temporary reduction in vegetative cover, may reduce soil fertility in some areas.

Productivity of farmlands around treatment sites will in the long range increase as public lands are freed of weed seeds. Agricultural producers will spend less time and money controlling weeds and more producing crops.

Irreversible or Irretrievable Commitment of Resources

Irretrievably committed resources include the loss of some broad-leaved plants and the petrochemical/maintenance expenses for vehicles used to implement the proposed action.

Impacts of the Alternatives

Alternative B: Use of all Noxious Weed Control Treatments Except the Aerial Application of Herbicides (No Aerial)

Alternative B uses all components of the proposed action except aerial spray. Therefore, impacts of this alternative correspond to those components of the proposed action except those applying specifically to the helicopter application of herbicides.

Alternative C: Use of Labor - Intensive Manual and Mechanical Methods, and Biological Control (No Herbicides)

Alternative C uses all components of the proposed action except the use of herbicides. Therefore, impacts of this alternative correspond to those components of the proposed action except those applying specifically to the use of herbicides.

Mechanical control would be used over a greater area under this alternative. Therefore, impacts of the proposed action resulting from mechanical weed control would be multiplied. Impacts from mechanical treatment of noxious weeds are limited to increases in erosion and subsequent delivery of sediment to stream channels.

On-site impacts from control of noxious weeds within 100 feet of a lake or stream would be most serious if control is in large contiguous blocks. Such control would minimize effectiveness of the remaining vegetation to filter out soil material. Where mechanical or manual weed removal results in much of a decrease in the existing ground cover, erosion could measurably increase causing visible rills and perhaps gullies.

Where gullies are produced, measurable increases in sediment delivered to the stream would occur, particularly in the case of an advancing head-cut.

If disturbance is minimized, measurable increases in suspended sediment are not likely to occur. However, erosion from the site would be greater than if the site would have been properly treated with herbicides.

Mechanical treatment on slopes greater than 10 percent would have a high probability of causing increased erosion. Areas where control would be conducted in a large block with a large reduction in existing ground cover could cause measurable changes in suspended sediment concentrations even though they may be located several hundred yards from a lake or stream. The severity of the impact would be dependent on the uses of the water.

Alternative D: No Action

Designated noxious and declared weeds will continue to spread, reducing the productivity of farmland, rangeland and wildlife habitat. Loss of land productivity would result in declines in wildlife habitat and livestock forage production. Private landowners and state and federal taxpayers will face increased economic burdens to combat unchecked noxious weeds on lands other than those administered by BLM.

V. CONSULTATION AND COORDINATION

List of Preparers (BLM)

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Steve Ellis - Soil Scientist/Hydrologist - Idaho State Office (Team Leader)
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John Rice - Forester - Idaho State Office
Alan Thomas - Wildlife Biologist - Idaho State Office
George Weiskircher - Outdoor Recreation Planner - Idaho State Office
Richard Wright - Range Conservationist - Burley District Office
Kimberly Ledford - Secretary - Idaho State Office
Cartography Staff - Idaho State Office

Agencies and Other Entities Consulted

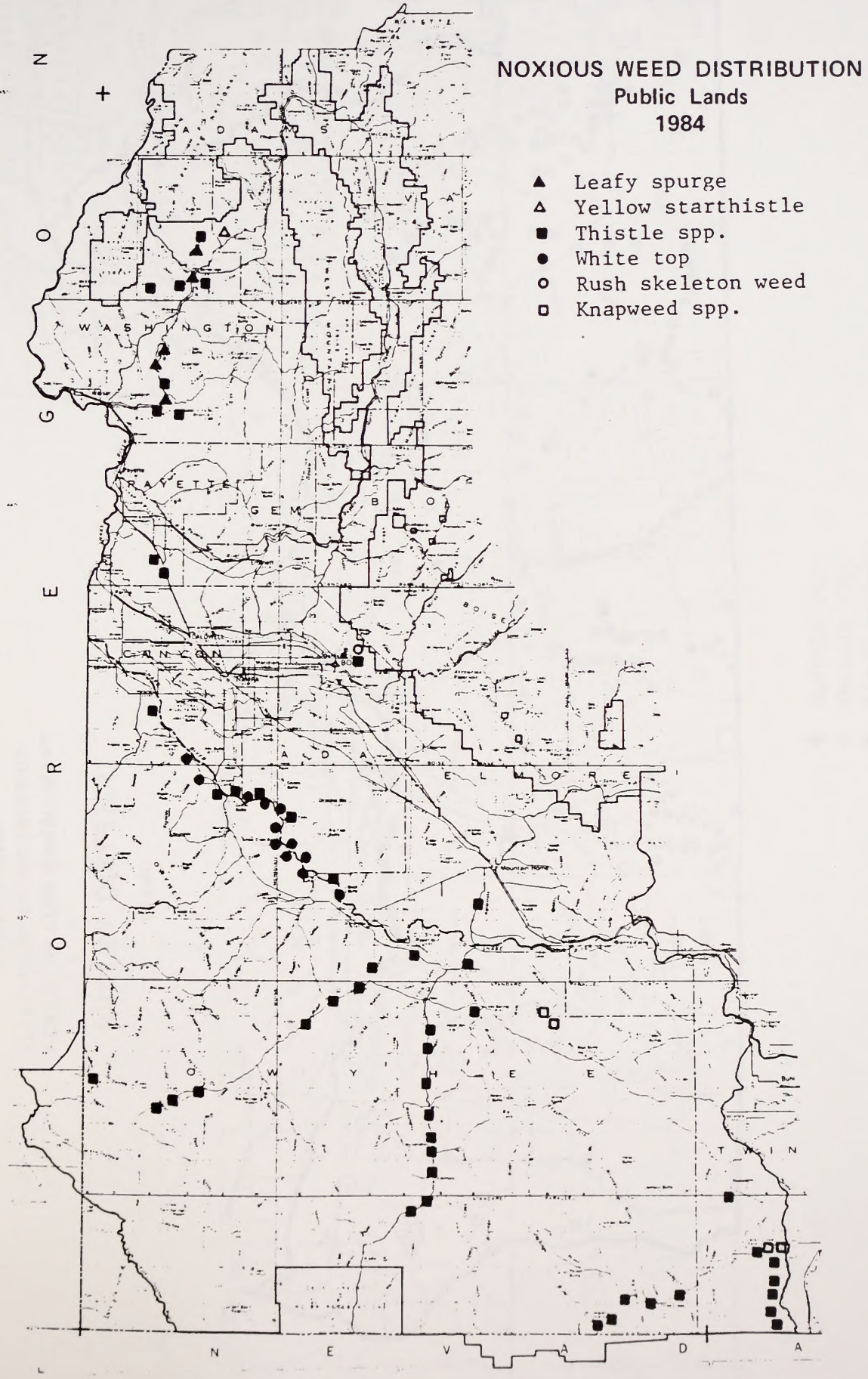
U.S. Fish and Wildlife Service
U.S. Department of Agriculture, Soil Conservation Service
State of Idaho, Department of Agriculture
University of Idaho, College of Agriculture, Cooperative Extension Service
County Weed Supervisors (see Appendix D for list)

Noxious weed control has been an ongoing program in Idaho for several years. The above entities have been consulted in previous years and will continue to be consulted as the program continues. These entities provide valuable information in identifying areas where noxious weeds exist and in identifying appropriate control measures.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BOISE DISTRICT

IDAHO

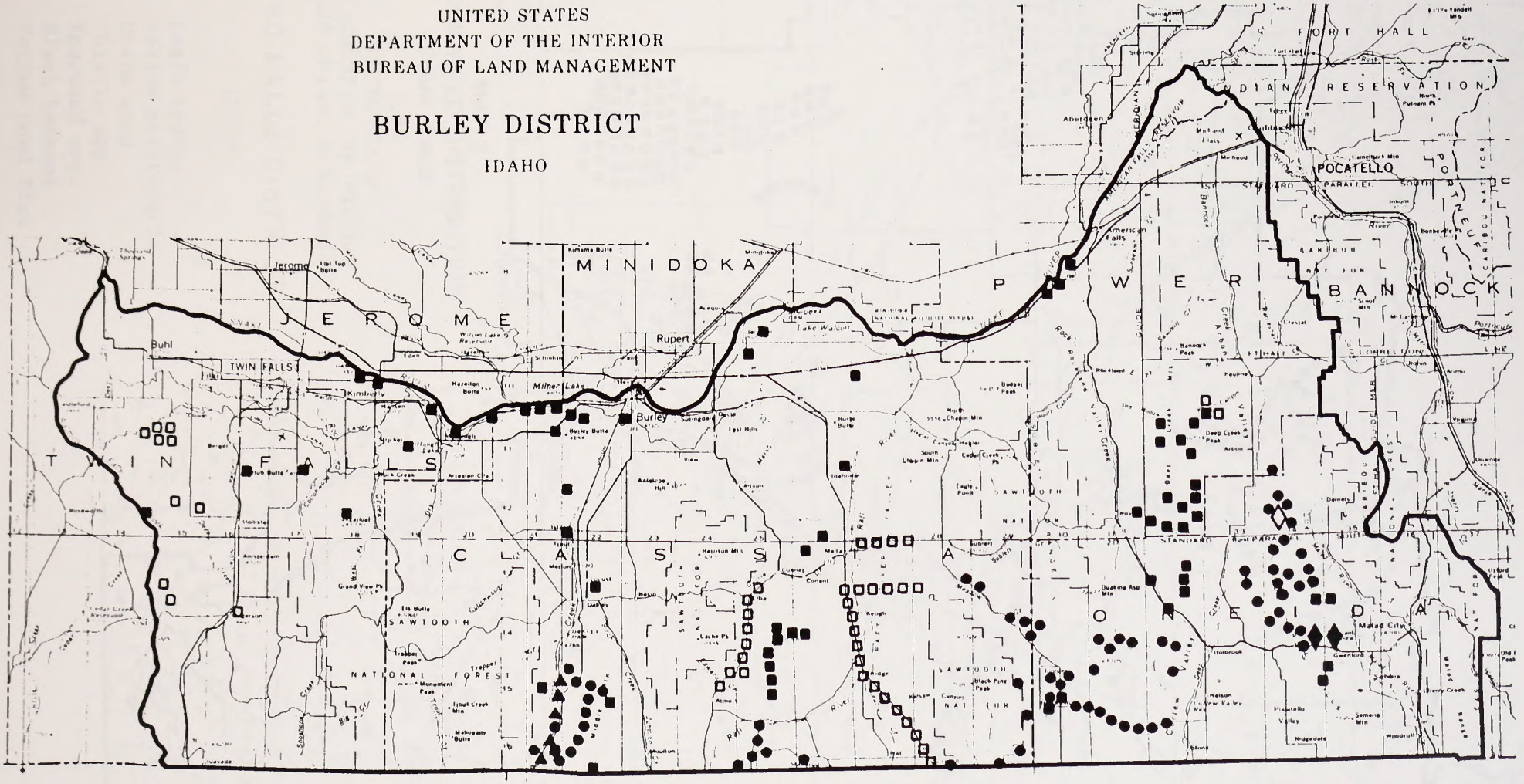


NOXIOUS WEED DISTRIBUTION
Public Lands
1984

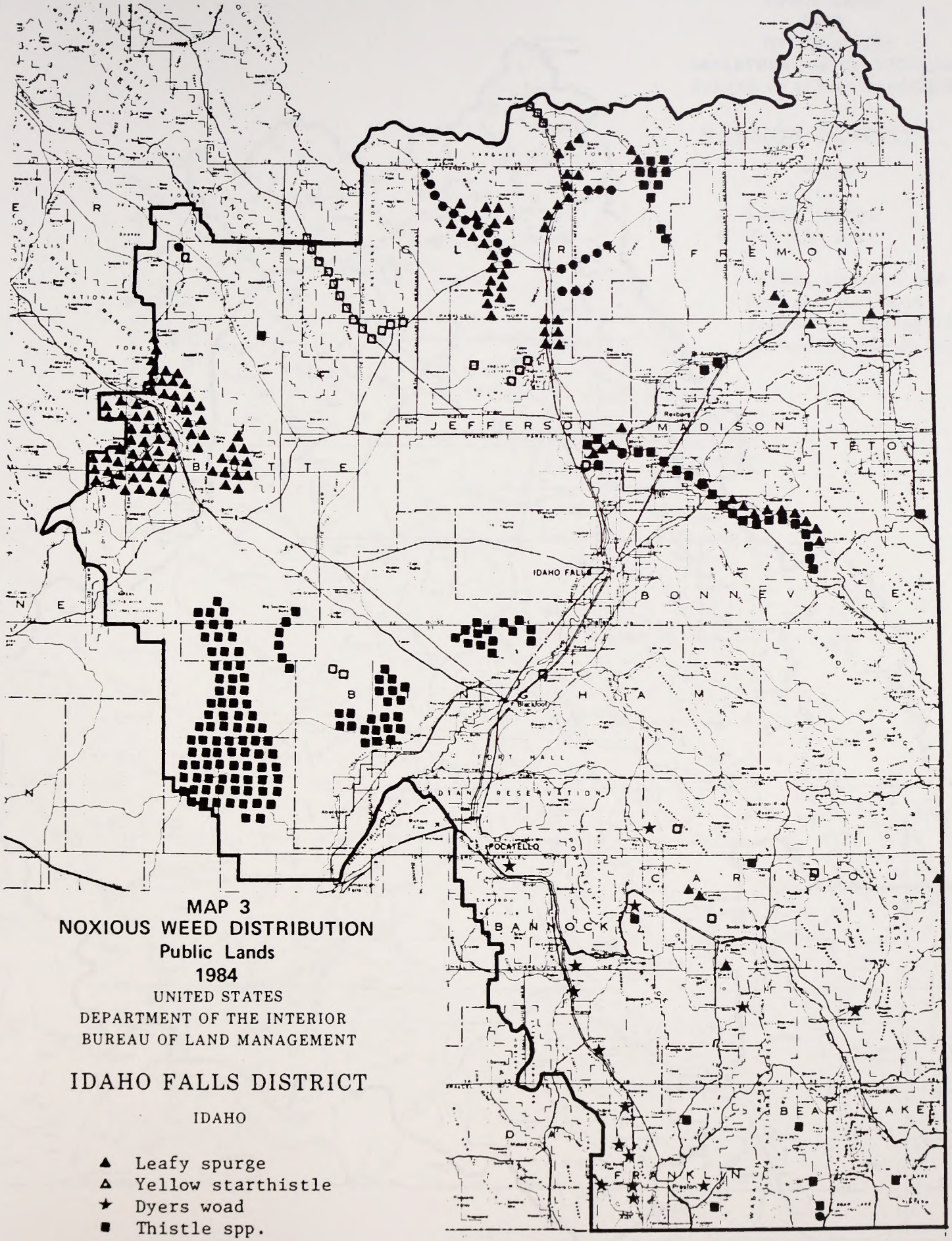
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BURLEY DISTRICT

IDAHO



- ♦ Buffalo bur
- ■ Thistle spp.
- ● Black henbone
- ◇ White top
- □ Knapweed spp.
- ▲ Leafy spurge



MAP 3
NOXIOUS WEED DISTRIBUTION
Public Lands
1984

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

IDAHO FALLS DISTRICT

IDAHO

- ▲ Leafy spurge
- △ Yellow starthistle
- ★ Dyers woad
- ■ Thistle spp.
- □ Knapweed spp.
- ● Black henbane
- ○ Yellow toad flax

NOXIOUS WEED DISTRIBUTION
Public Lands
1984

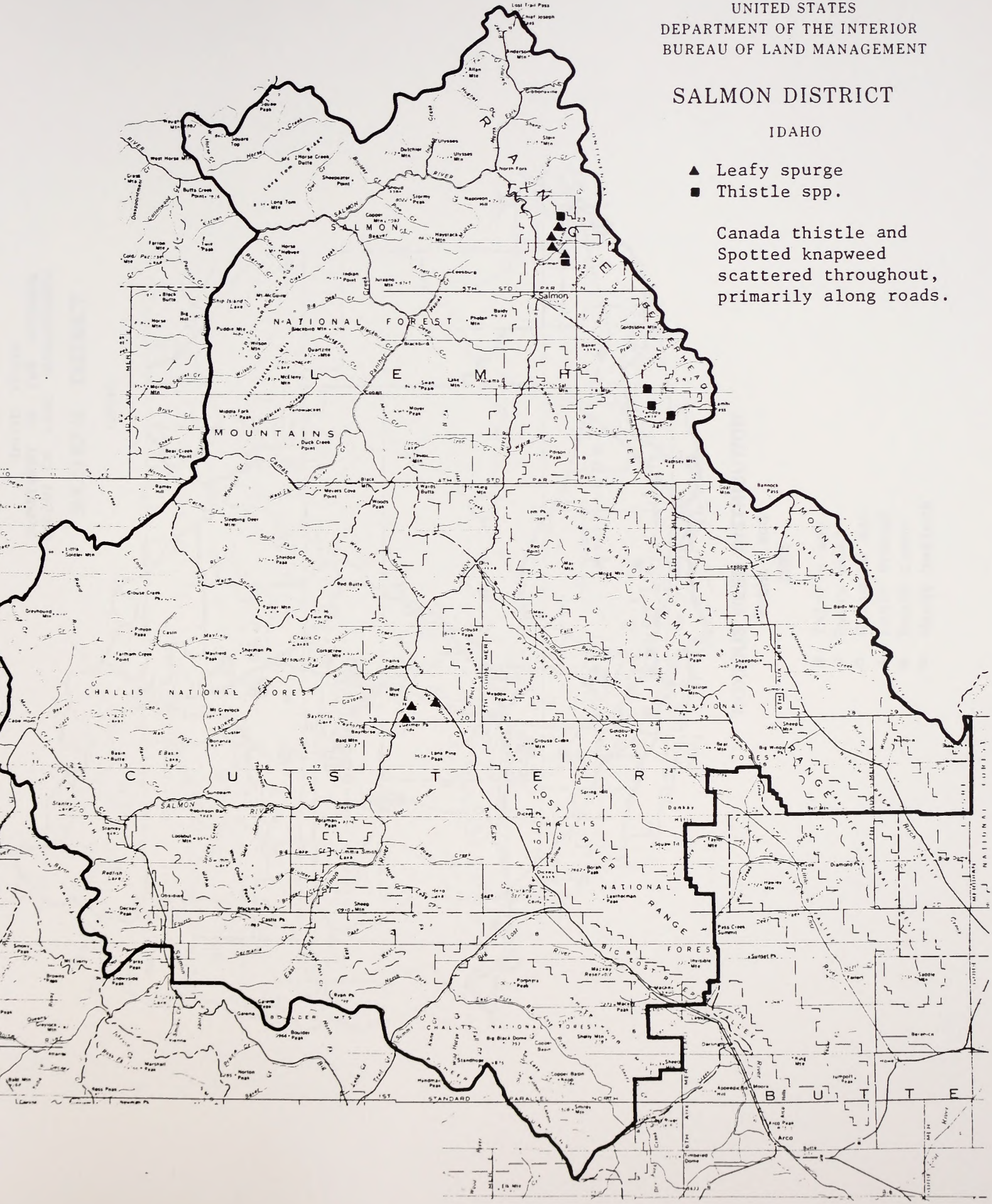
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

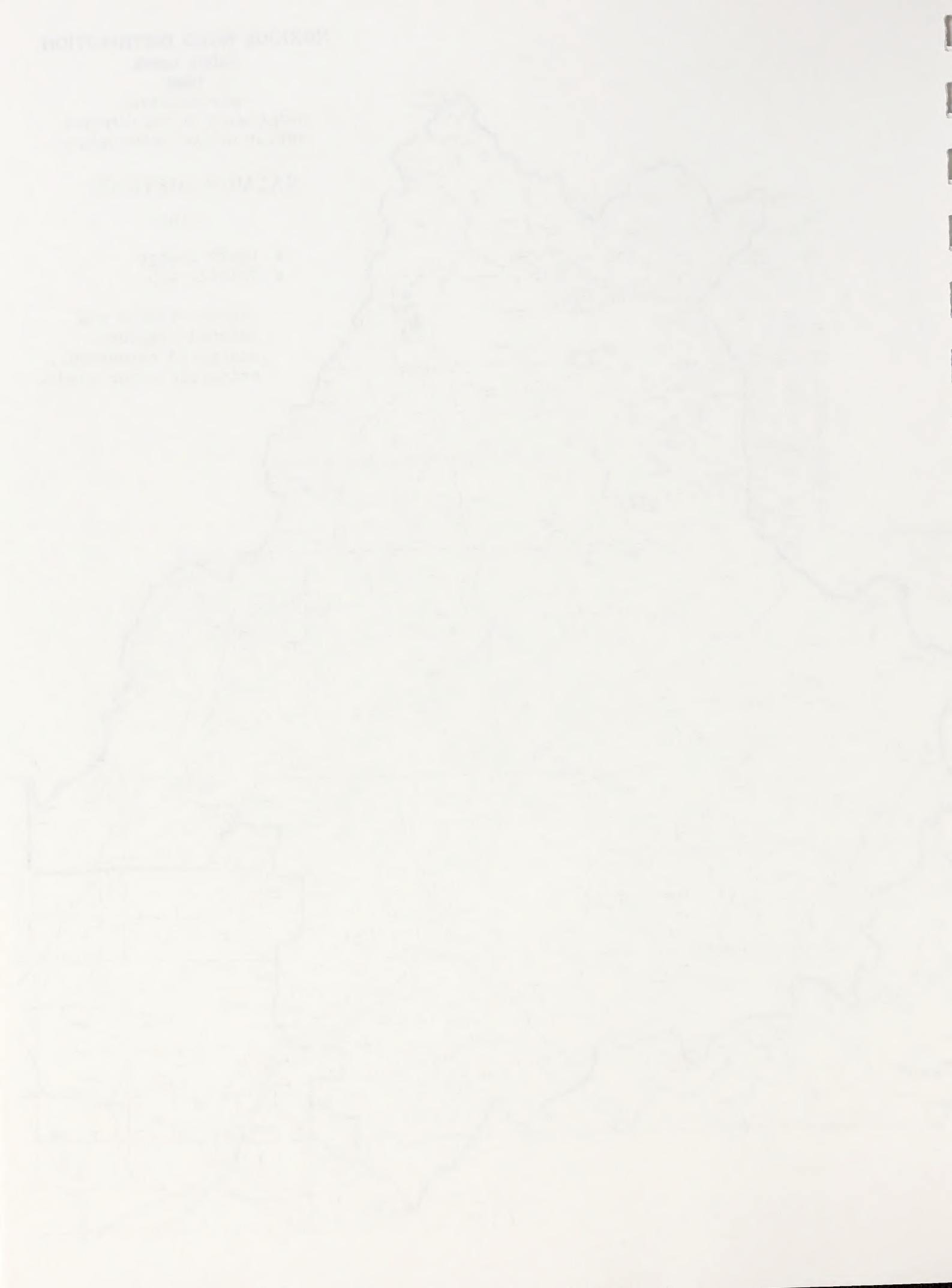
SALMON DISTRICT

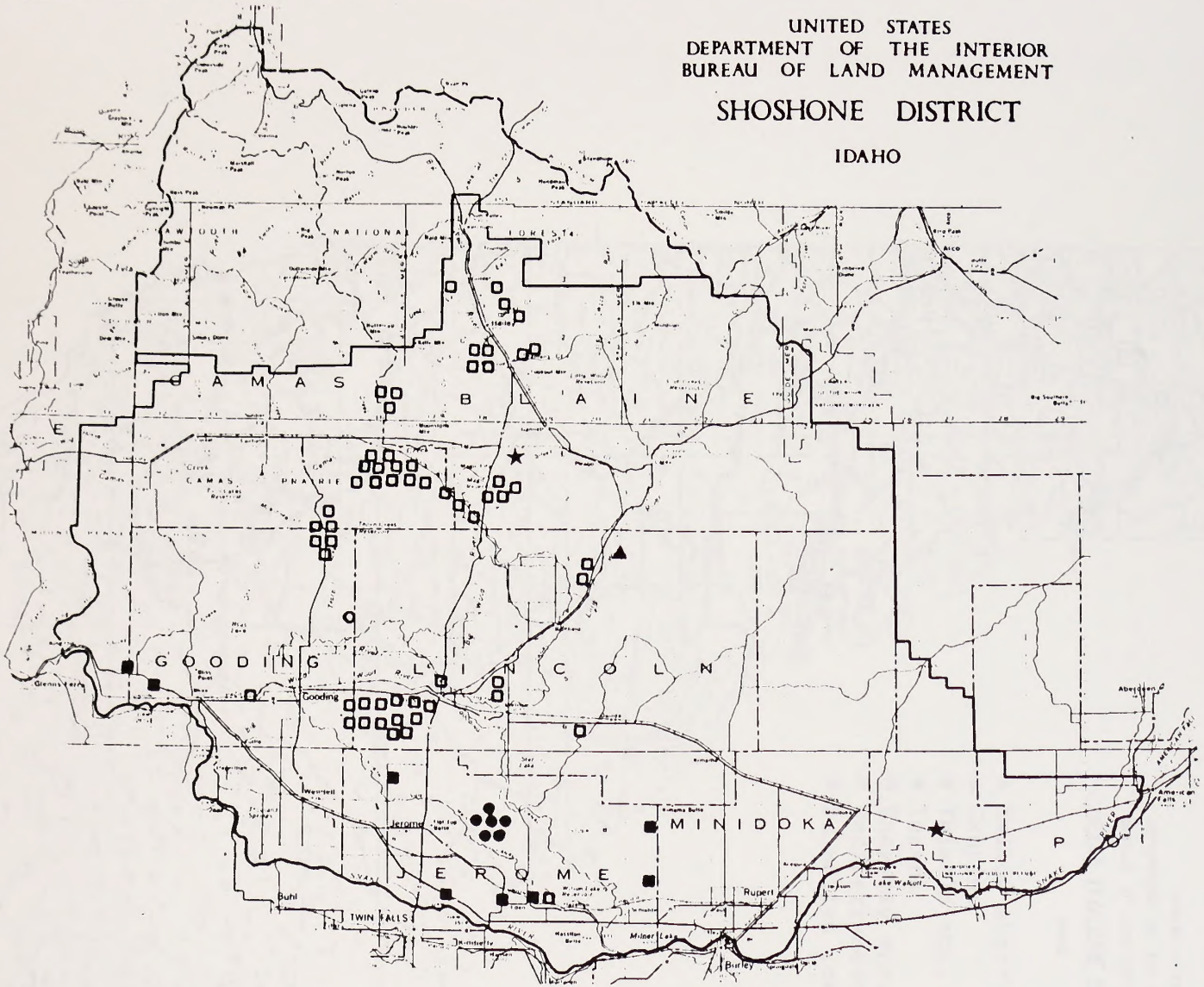
IDAHO

- ▲ Leafy spurge
- ■ Thistle spp.

Canada thistle and Spotted knapweed scattered throughout, primarily along roads.

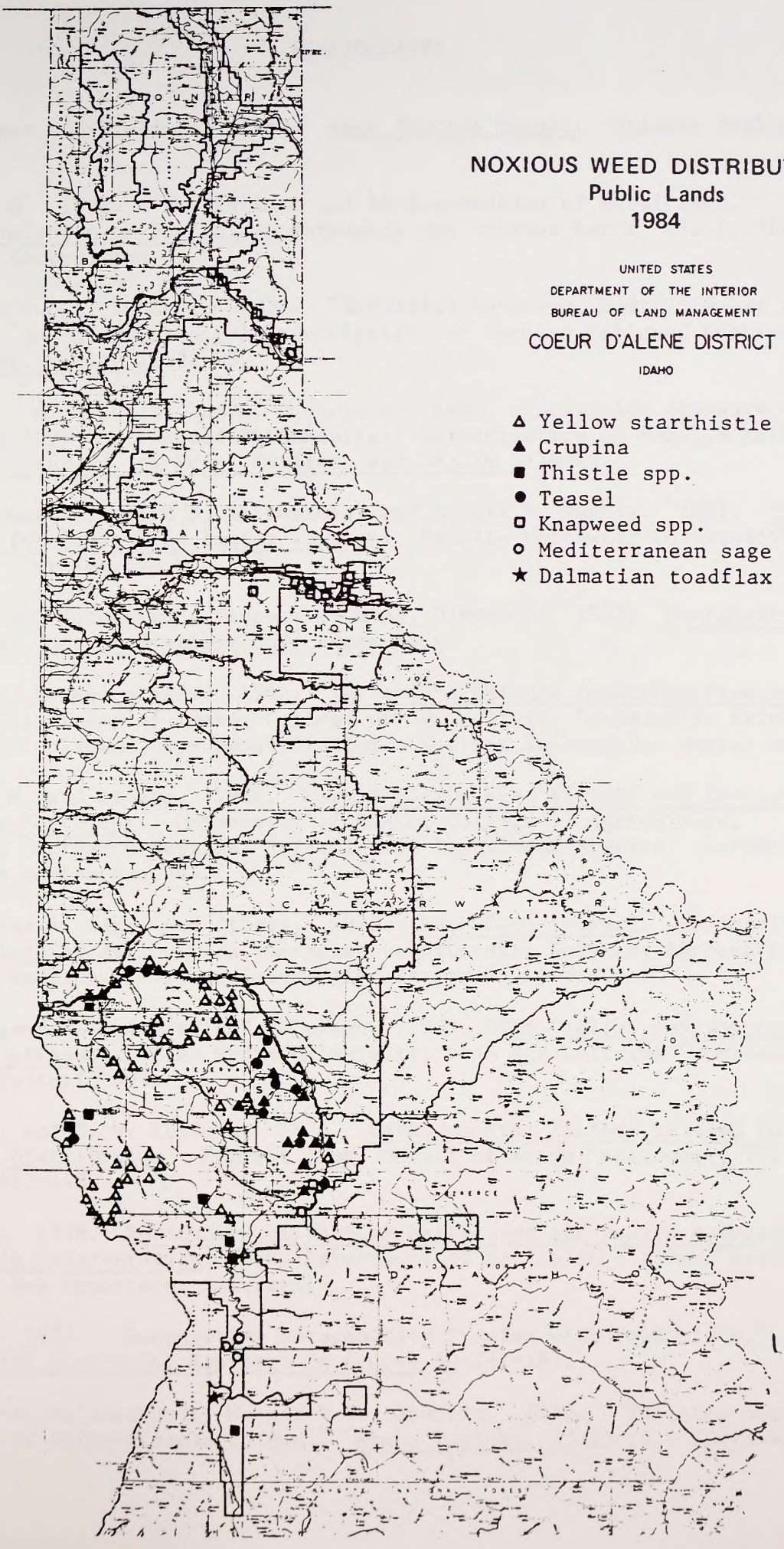






NOXIOUS WEED DISTRIBUTION
Public Lands
1984

- ■ Thistle spp.
- ★ Dyers woad
- □ Knapweed spp.
- ▲ Leafy spurge
- ● Death camas
- ○ Water hemlock


NOXIOUS WEED DISTRIBUTION
Public Lands
1984
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COEUR D'ALENE DISTRICT
IDAHO
△ Yellow starthistle
▲ Crupina
■ Thistle spp.
● Teasel
□ Knapweed spp.
○ Mediterranean sage
★ Dalmatian toadflax
SHOSHONE
CLEARWATER
LEWIS

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Glossary

Acid equivalent -- The theoretical yield of parent acid from an active ingredient.

Acres of Infestation -- The total number of acres of land, which weeds cover, as opposed to an infested acre which could be one weed plant in an acre. See infestation acre.

Active ingredient -- That part of a chemical compound directly responsible for the control of the specific pest.

Acute Oral LD50 -- The dosage required to kill 50% of the test animals when given a single oral dose in toxicity studies. The dose is expressed by the weight of the chemical per unit of body weight such as milligrams of toxicant per kilogram of body weight of the test animal.

Acute toxicity -- The poisoning effects of a single dose or exposure given over a short period.

Annual -- A plant that completes its life cycle in one year.

Aquatic Life Criteria -- Aquatic life criteria specify concentrations of water constituents which if not exceeded will protect an organism and an organism community with an adequate degree of safety.

Biennial -- A plant that completes its life cycle in two years. In the first year, which is frequently referred to as the rosette stage, the seed germinates and the plant produces leaves and roots and stores food.

Biological control -- Controlling a pest by its natural enemies that may already occur in the area or may be introduced.

Brand name -- The name, number, trade-mark or designation applied to an economic poison of any particular description by the manufacturer, distributor, importer or render.

Broadcast application -- An application of pesticide over the entire area of field rather than only to rows, beds, middle or individual plants.

Broadleaf plants -- Botanically classified as dicotyledons. Plants have two cotvledon leaves in the seedling stage; true leaves are broad and have netlike or reticulate veins.

Buffer zone -- An area between the area to be treated and an area to be protected designated to alleviate the effects of treatment upon a resource.

Carcinogen -- Any cancer-producing substance.

Carrier -- The liquid or solid material added to the active ingredient to facilitate its preparation, storage, shipment or field application.

Chronic toxicity -- The poisoning effects of a series of small doses applied over a major portion of the lifespan of an animal.

Concentration -- Refers to the amount of active ingredient or acid equivalent in a given weight or volume of a mixture. Recommendations and specifications for concentrations of pesticides are frequently given as pounds per unit volume of mixture.

Control -- Reduction of the pest problem to a point where it does not cause significant economic damage.

Dermal -- Pertaining to the skin.

Diluent -- Any liquid or solid material used to dilute or carry an active ingredient.

Dissolved solids -- The total amount of dissolved material, organic and inorganic, contained in water or wastes. Excessive dissolved solids make water unpalatable for drinking and unsuitable for industrial uses.

Dormant -- Period of time in which seeds and other plant parts do not grow due to natural causes.

Dose (Rate) -- The terms are the same; however, rate is preferred. They refer to the amount of active ingredient applied to a unit area regardless of percentage of chemical in the carrier.

Drift -- The movement of air-borne pesticide particles by air motion or wind away from the intended target area.

Ephemeral stream -- One that flows only in direct response to precipitation and whose channel is at all times above the water table.

Eradication -- Complete elimination of the pest problem from a designated area.

Exposure -- Application of test material to the external surfaces of a test organism; takes into consideration route, duration, and frequency.

Foliar application -- Applications of the pesticide to plant foliage.

Follow-up program -- To apply herbicides to a weed infested area lying outside or on the periphery of an area that had originally been treated with a herbicide to eliminate the intended weed species.

Formulation -- A mixture containing the active pesticide, the carrier, diluents, and other additives required to make the material ready for application.

Granules -- Pesticide formulation in which the active ingredient is impregnated on small particles of a carrier such as clay or ground corncobs.

Herbaceous plant -- A vascular plant that remains soft or succulent and does not develop woody tissue.

High volume sprays -- Spray applications of more than 60 gallons per acre volume.

High-water line -- Generally, the maximum level a stream or impounded body of water will reach during the spring runoff period.

Infestation acre -- One designated (noxious) weed plant per acre constitutes an infested acre.

Inert ingredient -- That part of a compound without toxic or killing props sometimes called the carrier.

Inner streambank -- That part of the streambank that is between the years obvious high-water line and the water level at the time of observation.

Intermittent stream -- One which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

Knapsack sprayer (backpack) -- A light sprayer constructed to fit the back or be carried by the operator.

Label -- All written, printed, or graphic matter on or attached to pesticide containers as required by law.

LC -- Lethal concentration.

LC50 -- The concentration of a toxicant which is lethal (fatal) to 50 percent of the organisms tested under the test conditions in a specified time. LC50 values are used in inhalation studies and in many toxicity experiments with fish and other wildlife.

LC100 -- An LC which kills all of the test organisms.

LD -- Lethal dose.

LD50 - The dose of a toxicant that is lethal (fatal) to 50 percent of the organisms tested under the test conditions in a specified time. A dose is the quantity actually administered which is the amount of toxicant in a unit of test medium rather than the amount ingested by or administered to the organism.

LEL -- Lowest effect level. In a series of dose levels tested, it is the lowest level at which an effect is observed in the species tested.

Liter (l) -- The volume occupied by 1 kilogram of water at a pressure of 760 mm of mercury and a temperature of 4 C. A leter is 1.0567 quart.

Low volume spray -- A spray application of 5 to 20 gallons per acre.

Low-water line -- Generally, the lowest level a stream will reach during the late summer and autumn months.

Median threshold limits (TLm) -- Synonymous with the median tolerance limit (TL50) but expressed in a slightly different way, i.e., the concentration of a test material at which half of the test animals are able to survive under test conditions over a specified time.

Microgram per kilogram (ug/kg) -- The concentration at which a millionth of a gram (1 microgram) is contained in a mass of 1 kilogram. A kilogram is 2.2046 pounds.

Milligram per kilogram (mg/kg) -- The concentration at which 1 thousandth of a gram (1 milligram) is contained in a mass of one kilogram. A gram contains 1,000 milligrams; expressed usually of milligrams toxic chemical per kilogram of body weight.

Milligram per liter (mg/l) -- The concentration at which 1 milligram (10 3g) is contained in a volume of 1 liter.

Minimum treatment -- Whatever minimum control efforts the District Board of Directors, by two-thirds vote, deem is necessary to start controlling a designated noxious weed infestation.

MLD -- Minimum lethal dose; the smallest of several doses which kills one of a group of test animals.

Mutagenic -- Capable of inducing a mutation. An agent that tends to increase the occurrence or extent of mutation.

Non-riparian zone -- Land not associated with streams or any other natural body of water.

Nontarget vegetation -- Vegetation which is not expected or not planned to be affected by the treatment.

Noxious weed -- A plant defined by law as being especially undesirable, troublesome, or difficult to control.

Oncogenic (tumorigenic) -- Capable of producing or inducing tumors in animals. The tumors may be either malignant (cancerous) or benign (non-cancerous).

Part per million (ppm) -- A concentration at which one unit is contained in a total of a million units. Any units may be used (e.g., weight, volume) but in any given application identical units should be used (e.g., grams per million grams or liters per million liters).

Peak flow -- The maximum quantity of water flowing at any one time in a river or stream. Measurement is usually made in cubic feet per second (CFS).

Perennial -- A plant that lives for more than two years.

Perennial stream -- One which flows continuously.

Pesticide -- Any substance or mixture or substances intended for controlling insects, rodents, fungi, weeds, and other forms of plants or animal life that are considered to be pests.

Phenoxy herbicide -- A family of herbicides with a molecular structure composed of:

(1) An aromatic (benzene) ring;

(2) An oxygen atom substituted for one hydrogen bonded to the ring;

(3) A carboxyl group bonded indirectly to an oxygen atom, separated from the oxygen atom by an aliphatic chain of one or more carbon atoms;

(4) Various constituents of a ring.

Phytotoxic -- Poisonous or injurious to plants.

psi -- Pounds per square inch.

Rate -- Same as dosage. It is the amount of active ingredient material applied to a unit area regardless of percentage of chemical in the carrier.

Reentry interval -- The length of time between the pesticide applications and reentry into the field.

Registered -- Pesticides that have been approved for certain uses by the Environmental Protection Agency.

Residual -- A compound that persists or continues to have activity against specific forms of plant and animal life.

Resistance -- The degree to which an organism may suppress or retard the injurious effects of a pesticide.

Retreatment program -- To apply herbicides to an area of land, that had previously been treated with a herbicide, to eradicate the intended weed species that was not eliminated with the first application

Rhizome -- Underground root-like stem that produces roots and leafy shoots

Riparian habitat -- Riparian habitat is a unique and specialized form of wetland restricted to areas along, adjacent, or contiguous with perennially and some intermittently flowing rivers and streams and other bodies of water. Riparian vegetative species composition is highly variable and can range from water-loving forms (phreatophytes or hydrophytes), such as sedges, tamerisk, cottonwood and willow, through more traditional terrestrial forms, such as Douglas Fir, Aspen. Riparian vegetation along some intermittently flowing streams may not differ in species composition and density from the surrounding vegetation types. For management purposes, riparian habitat is the onsite vegetation found immediately adjacent and subject to the influences of surface and subsurface waters from streams, rivers or standing bodies of water.

Selectivity -- A characteristic of some pesticide, whereby certain undesirable species are killed while others such as crop plants or beneficial insects are harmed very little, if any.

Sensitivity -- Not capable of withstanding effects of a pesticide.

Spot treatment -- The application of a pesticide to a selected individual area.

Stolon -- The above ground runners or slender stems that develop roots, shoots and new plants at the tip or nodes.

Subchronic toxicity -- The poisoning effects of regularly repeated doses or exposures over periods ranging from a few days to several months.

Suspension -- A liquid in which very fine solid material is suspended, but not dissolved.

Synergism -- Compounds working together to produce an effect greater than the sum of their individual actions.

Systemic -- Any compound that, when absorbed into one part of an organism, becomes distributed throughout.

Teratogen -- Any substance capable of producing structural abnormalities of prenatal origin, present at birth or manifested shortly thereafter (the ability to produce birth defects).

Threshold -- A dose or exposure below which there is no apparent or measurable adverse effect.

Tolerant -- The ability to withstand the effect.

Toxicity -- (1) The capacity or property of a substance to cause any adverse effects. It is based on scientifically verifiable data from animal or human exposure tests. (2) That specific quantity of a substance which may be expected, under specific conditions, to do damage to a specific living organism.

Translocation -- The movement of a chemical from the point of absorption (plant leaves, stems, or roots) to other leaves, buds or root tips. Translocation also occurs in animals treated with certain pesticides.

Vapor drift -- The movement of pesticide vapors from the area of application to other areas.

Waiting period -- The time interval (hours or day) between application and harvest which will insure conformance with residue tolerances or label directions.

Weed -- A plant out of place or growing where not desired.

APPENDIX A

IDAHO DEPARTMENT OF AGRICULTURAL DESIGNATED NOXIOUS WEEDS

Austrian field cress (Rorippa austriaca) (Crantz) Bess.
Austrian pea weed or Swainsonpea (Swainsona salsula) (Poll) Taub.
Buffalo bur (Solanum rostratum)
Camelthorn (Alhagi camelorum) (Fish)
Canada thistle (Cirsium arvense) (L.) Scop.
Common crupina (Crupina vulgaris) (Cass.)
Dalmation toad flax (Linaria dalmatica) (L.) Mill.
Diffuse knapweed (Centaurea diffusa) Lam.
Dyers woad (Isatis tinctoria) L.
Field bindweed (Convolvulus arvensis) L.
Henbane (Hyoscyamus niger) L.
Jointed goatgrass (Aegilops cylindrica)
Leafy spurge (Euphorbia esula) L.
Loosestrife (lythrum salicaria) L.
Musk or nodding thistle (Carduus nutans) L.
Perennial pepperweed (Lepidium latifolium) L.
Perennial sowthistle (Sonchus arvensis) L.
Poison hemlock (Conium maculatum)
Puncture vine (Tribulus terrestris) L.
Rush skeleton weed (Chondrilla juncea) L.
Russian knapweed (Centaurea repens) L.
Scotch thistle (Onopordon acanthium) L.
Silver-leaf nightshade (Solanum elaeagnifolium) Cav.
Skeletonleaf bursafe (Franseria discolor) Nutt.
Spotted knapweed (Centaurea maculosa) Lam.
Syrian bean caper (Zygophyllum fabago) L.
Tansy ragwort (Senecio jacobaea)
White-top (Cardaria draba) (L.) Desv.
Wild carrot or Queen Anne's lace (Daucus carota) L.
Yellow star thistle (Centaurea solstitialis) L.
Yellow toad flax (Linaria vulgaris) Hill.

APPENDIX B
IDAHO COUNTIES CONDUCTING WEED CONTROL ON FEDERAL LAND
IN 1983

Ada
Adams
Bannock
Bear Lake
Bingham
Blaine
Boise
Bonneville
Boundry
Butte
Camas
Caribou
Cassia
Clark
Clearwater
Elmore
Franklin
Fremont
Gem
Gooding
Jefferson
Jerome
Latah
Lincoln
Nez Perce
Oneida
Owyhee
Power
Teton
Twin Falls
Valley
Washington

APPENDIX C

IDAHO COUNTIES HAVING COOPERATIVE AGREEMENTS/CONTRACTS WITH BLM FOR NOXIOUS WEED CONTROL (1983)

Year	County	Amount Requested
1983	Ada	$2,500.00
1983	Adams	1,000.00
1983	Bannock	1,200.00
1983	Bingham	855.44
1983	Boise	1,000.00
1983	Caribou	300.00
1983	Cassia	5,800.00
1983	Elmore	500.00
Open	Franklin	500.00
1983	Jerome	2,500.00
1983	Oneida	1,200.00
1983	Owyhee	1,000.00
1983	Power	500.00
1982	Teton	Open
Open	Twin Falls	3,000.00
1984	Valley w/BOR	1,000.00
1984	Washington	2,500.00
1983	Wood River RC&D	9,000.00

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354-2961

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Donnelly, ID 83615
325-8566

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Emory Tendoy
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Fort Hall, ID 83203
238-3777

APPENDIX E

Carson Foley Act

Federal Noxious Weed Act of 1974

PUBLIC LAW 90-583
90th Congress, S. 2671
October 17, 1968

AN ACT

82 Stat. 1146

To provide for the control of noxious plants on land under the control or jurisdiction of the Federal Government.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the heads of Federal departments or agencies are authorized and directed to permit the commissioner of agriculture or other proper agency head of any State in which there is in effect a program for the control of noxious plants to enter upon any lands under their control or jurisdiction and destroy noxious plants growing on such land if---

Noxious Plant control.

(1) such entry is in accordance with a program submitted to and approved by such department or agency: Provided, That no entry shall occur when the head of such Federal department or agency, or his designee, shall have certified that entry is inconsistent with national security;

(2) the means by which noxious plants are destroyed are acceptable to the head of such department or agency; and

(3) the same procedure required by the State program with respect to privately owned land has been followed.

Sec. 2. Any State incurring expenses pursuant to section 1 of this Act upon presentation of an itemized account of such expenses shall be reimbursed by the head of the department or agency having control or jurisdiction of the land with respect to which such expenses were incurred: Provided, That such reimbursement shall be only to the extent that funds appropriated specifically to carry out the purposes of this Act are available therefor during the fiscal year in which the expenses are incurred.

Sec. 3. There are hereby authorized to be appropriated to departments or agencies of the Federal Government such sums as the Congress may determine to be necessary to carry out the purposes of this Act.

Appropriation authorization.

Approved October 17, 1968

CONSIDERATIONS FOR IMPLEMENTING PL 90-583 (CARLSON BILL)

(Prepared by Interagency Ad Hoc Committee selected by The Weed Committee of the Department of Agriculture and Interior, and reviewed by representatives from USDA, Interior and Defense Agencies having jurisdiction over Federal lands)

Interpretation of PL 90-583

1. "Heads of Federal departments or agencies" suggest delegation to appropriate field unit administrators directly responsible for resource management and action programs.

2. "Commissioner of Agriculture or other proper agency head of any State" is construed to mean such instrumentality, including weed districts, in those States with effective weed laws and an active noxious plant control program with the coordination responsibility centered in the State Department of Agriculture

3. Authorizes suitable appropriation of funds by Congress to Federal departments or agencies to conduct adequate and effective noxious plant control on federally administered lands in cooperation with those States in which there is in effect a noxious plant control program. This appears to be the key provision of the Act. State control of noxious plants occurring on Federal lands is very unlikely without assurance of reimbursement. Further, improved financing levels would enable Federal agencies to undertake appropriate plant control programs as a normal phase of resource management with or without State cooperation.

Implementation of PL 90-583

1. Documentation of Federal land-managing agencies'-bureaus' known noxious plant control needs in those States with active control programs as a basis for requesting suitable funding for this purpose from Congress.

2. Where cooperative Federal-State control programs are contemplated, determination of annual needs will require close coordination of concerned parties to establish realistic goals within funding ability of each party. Such determination should be accomplished well in advance of Federal agencies' annual budget submission to insure inclusion of this item.

3. Suitable appropriation of funds by Congress for Federal departments' agencies' or bureaus' noxious plant control programs is not to be construed as an obligation to utilize the State, or proper agency head thereof, in the control effort. Purposes of the Act can be fulfilled

by the Federal department or agency performing the needed control work providing it is of a quality comparable to that accomplished by the State program on private lands.

Recommendations

1. Cooperative aspects of action programs involving Federal agency-bureau and State field units to be coordinated and implemented through maximum use of local agreements under existing authorities. Present agreements between federal and states appear to be adequate for purposes of this Act.

2. Concerned Federal departments should request respective agencies or bureaus to contact their State Commissioners of Agriculture (or other proper State agency head) advising them of the agency's or bureau's desire to implement provisions of PL 90-583 and to solicit bureau involvement for FY 1971 with a projection of annual needs for a subsequent 5-year period (through FY 1975).

3. Each Federal agency or bureau to seek appropriations beginning in FY 1971 or as soon thereafter as possible to implement the cooperative control programs developed with those States in which there is in effect a program for control of noxious plants.

4. Consider resolution by appropriate memoranda of understanding between concerned heads of Federal agency or bureau and State in the event that coordination cannot be effectively realized in localized situations.

Marines of the Marine Corps League, as the case may be.".

(b) The catchline and the chapter analysis item for section 7541 are amended by inserting immediately after "Boy Scouts of America" the following: "Naval Sea Cadet Corps and Young Marines of the Marine Corps League."

Effective date. 10 USC 7541 note.

SEC. 2. The amendments made by the first section shall take effect on the date of the enactment of this Act.

Approved January 3, 1971.

Public Law 91-629

January 4, 1971 [H. R. 11271]

AN ACT

To provide for the control and eradication of noxious weeds, and the regulation of the movement in interstate or foreign commerce of noxious weeds and potential carriers thereof, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Federal Noxious Weed Act of 1974".

Federal Noxious Weed Act of 1974. 7 USC 2801 note.

SEC. 2. The importation or distribution in interstate commerce of noxious weeds, except under controlled conditions, allows the growth and spread of such weeds which interfere with the growth of useful plants, clog waterways and interfere with navigation, cause disease, or have other adverse effects upon man or his environment and therefore is detrimental to the agriculture and commerce of the United States and to the public health. The uncontrolled distribution within the United States of noxious weeds after their importation or interstate distribution has like detrimental effects and allowing such distribution encourages and facilitates the burdening and obstructing of interstate and foreign commerce, and is inimical to the public interest. Accordingly, the Congress hereby determines that the regulation of transactions in, and movement of, noxious weeds as provided in this Act is necessary to prevent and eliminate burdens upon and obstructions to interstate and foreign commerce and to protect the public welfare.

Definitions. 7 USC 2802.

SEC. 3. As used in this Act, except where the context otherwise requires:

(a) "Secretary" means the Secretary of Agriculture of the United States or any other person to whom authority may be delegated to act in his stead.

(b) "Authorized inspector" means any employee of the Department of Agriculture, or any employee of any other agency of the Federal Government or of any State or other governmental agency which is cooperating with the Department in administration of any provisions of this Act, who is authorized by the Secretary to perform assigned duties under this Act.

(c) "Noxious weed" means any living stage (including but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish or wildlife resources of the United States or the public health.

(d) "United States" means any of the States, territories, or districts of the United States.

(e) "Interstate" means from any State, territory, or district of the United States into or through any other State, territory, or district.

(f) "District" means the District of Columbia, the Commonwealth of Puerto Rico, or any possession of the United States.

(g) "Move" means deposit for transmission in the mails, ship, offer

for shipment, offer for entry, import, receive for transportation, carry, or otherwise transport or move, or allow to be moved, by mail or otherwise.

Prohibitions. 7 USC 2803.

SEC. 4. (a) No person shall knowingly move any noxious weed, identified in a regulation promulgated by the Secretary, into or through the United States or interstate, unless such movement is authorized under general or specific permit from the Secretary and is made in accordance with such conditions as the Secretary may prescribe in the permit and in such regulations as he may promulgate under this Act to prevent the dissemination into the United States, or interstate, of such noxious weeds.

(b) The Secretary may refuse to issue a permit for the movement of any such noxious weed when, in his opinion, such movement would involve a danger of dissemination of such noxious weeds into the United States or interstate.

(c) No person shall knowingly sell, purchase, barter, exchange, give, or receive any such noxious weed which has been moved in violation of subsection (a), or knowingly deliver or receive for transportation or transport, in interstate or foreign commerce, any advertisement to sell, purchase, barter, exchange, give, or receive any such noxious weed which is prohibited from movement in such commerce under this Act.

Quarantines and regulations. 7 USC 2804.

SEC. 5. (a) The Secretary may promulgate such quarantines and other regulations requiring inspection of products and articles of any character whatsoever and means of conveyance, specified in the regulations, as a condition of their movement into or through the United States and otherwise restricting or prohibiting such movement, as he deems necessary to prevent the dissemination into the United States of any noxious weeds, and it shall be unlawful for any person to move any products, articles, or means of conveyance into or through the United States contrary to any such regulation.

Temporary quarantine.

(b) Whenever the Secretary has reason to believe that an infestation of noxious weeds exists in any State, territory, or district, he may by regulation temporarily quarantine such jurisdiction, or a portion thereof, and by regulation may restrict or prohibit the interstate movement from the quarantined area of any products and articles of any character whatsoever and means of conveyance, capable of carrying such noxious weeds, and after promulgation of such quarantine and other regulations, it shall be unlawful for any person to move interstate from a quarantined area any such products, articles, or means of conveyance, specified in the regulations, except in accordance with such regulations: *Provided, however*, That such quarantine and regulations shall expire at the close of the ninetieth day after their promulgation.

Expiration.

Hearing.

(c) However, if, after public hearing, the Secretary determines, on the basis of the information received at the hearing and other information available to him, that such a quarantine and regulations are necessary in order to prevent the interstate spread of noxious weeds from any State, territory, or district in which he determines an infestation of noxious weeds exists, and to protect the agriculture, commerce, fish, or wildlife resources of the United States or the public health, he shall promulgate such quarantine and other regulations as he determines are appropriate for such purposes, and thereafter it shall be unlawful for any person to move interstate from any quarantined area any regulated products, articles, or means of conveyance except in accordance with such regulations.

Disposal. 7 USC 2805.

SEC. 6. (a) Except as provided in paragraph (c) of this section, the Secretary may, whenever he deems it necessary as an emergency measure in order to prevent the dissemination of any noxious weed, seize, quarantine, treat, destroy, or otherwise dispose of, in such manner as he deems appropriate, any product or article of any character whatsoever, or means of conveyance, which is moving into or through the United States or interstate, in bond or otherwise, and which he has reason to believe is infested by any noxious weed or contains any such weed, or which has moved into the United States, or interstate, and which he has reason to believe was infested by or contained any noxious weed at the time of such movement; and any noxious weed, product, article, or means of conveyance which is moving into or through the United States, or interstate, or has moved into the United States, or interstate, in violation of this Act or any regulation hereunder.

(b) Except as provided in subsection (c) of this section, the Secretary may order the owner of any product, article, means of conveyance, or noxious weed subject to disposal under subsection (a) of this section, or his agent, to treat, destroy, or make other disposal of such product, article, means of conveyance, or noxious weed, without cost to the Federal Government and in such manner as the Secretary deems appropriate. The Secretary may apply to the United States District Court, or to the United States court of any territory or possession, for the judicial district in which such person resides or transacts business or in which the product, article, means of conveyance, or noxious weed is found, for enforcement of such order by injunction, mandatory or otherwise. Process in any such case may be served in any judicial district wherein the defendant resides or transacts business or may be found, and subpoenas for witnesses who are required to attend a court in any judicial district in such a case may run to any other judicial district.

(c) No product, article, means of conveyance, or noxious weed shall be destroyed, exported, or returned to shipping point of origin, or ordered to be destroyed, exported, or so returned under this section, unless in the opinion of the Secretary there is no less drastic action which would be adequate to prevent the dissemination of noxious weeds into the United States or interstate.

Civil action.

(d) The owner of any product, article, means of conveyance, or noxious weed destroyed, or otherwise disposed of, by the Secretary under this section, may bring an action against the United States in the United States District Court for the District of Columbia, within one year after such destruction or disposal, and recover just compensation for such destruction or disposal of such product, article, means of conveyance, or noxious weed (not including compensation for loss due to delays incident to determining its eligibility for movement under this Act) if the owner establishes that such destruction or disposal was not authorized under this Act. Any judgment rendered in favor of such owner shall be paid out of the money in the Treasury appropriated for administration of this Act.

Authorized inspections. 7 USC 2806.

SEC. 7. Any authorized inspector, when properly identified, shall have authority (a) without a warrant, to stop any person or means of conveyance moving into the United States, and inspect any noxious weeds and any products and articles of any character whatsoever, carried thereby, and inspect such means of conveyance, to determine whether such person or means of conveyance is moving any noxious weed, product, article, or means of conveyance contrary to this Act or any regulation under this Act; (b) without a warrant, to stop any person or means of conveyance moving through the United States or interstate, and inspect any noxious weeds and any products and articles of any character whatsoever carried thereby, and inspect such means of conveyance, to determine whether such person or means of conveyance is moving any noxious weed, product, article, or means of conveyance contrary to this Act or any regulation thereunder, if such inspector has probable cause to believe that such person or means of conveyance is moving any noxious weed regulated under this Act; and (c) to

enter, with a warrant, any premises in the United States, for purposes of any inspections or other actions necessary under this Act. Any judge of the United States or of a court of record of any State, territory, or district, or a United States commissioner, may, within his respective jurisdiction, upon proper oath or affirmation showing probable cause to believe that there are on certain premises any products, articles, means of conveyance, or noxious weeds subject to this Act, issue warrants for the entry of such premises for purposes of any inspection or other action necessary under this Act, except as otherwise provided in section 9 of this Act. Such warrants may be executed by any authorized inspector or any United States marshal. Warrants, issuance.

SEC. 8. Any person who knowingly violates section 4 or 5 of this Act, or any regulation promulgated under this Act, shall be guilty of a misdemeanor and shall be punished by a fine not exceeding $5,000, or by imprisonment not exceeding one year, or both. Penalty. 7 USC 2607.

SEC. 9. (a) The Secretary is authorized to cooperate with other Federal agencies, agencies of States, territories, or districts, or political subdivisions thereof, farmers' associations, and similar organizations, and individuals in carrying out operations or measures in the United States to eradicate, suppress, control, or prevent or retard the spread of any noxious weed. The Secretary is authorized to appoint employees of other agencies of the Federal Government or any agencies of any State, territory, or district, or political subdivisions thereof, as collaborators to assist in administration of the provisions of this Act, pursuant to cooperative agreements with such agencies, whenever he determines that such appointments would facilitate administration of this Act. Federal agencies, cooperation. 7 USC 2608.

(b) In performing the operations or measures authorized by subsection (a) of this section, the cooperating State or other governmental agency shall be responsible for the authority necessary to carry out the operations or measures on all lands and properties within the State or other jurisdiction involved, other than those owned or controlled by the United States Government, and for such other facilities and means as in the discretion of the Secretary are necessary.

SEC. 10. The Secretary is authorized to promulgate regulations necessary to effectuate the provisions of this Act. However, any regulation identifying a noxious weed under section 4 of this Act shall be promulgated only after publication of a notice of the proposed regulation and, when requested by any interested person, a public hearing on the proposal. Any such regulation shall be based upon the information received at any such hearing and other information available to the Secretary and a determination by the Secretary that the plant is within the definition of a noxious weed in section 3(c) of this Act and that its dissemination in the United States may reasonably be expected to have, to a serious degree, any effect specified in section 3(c). Regulations. 7 USC 2609. Hearing.

SEC. 11. There are hereby authorized to be appropriated such sums as Congress may from time to time determine to be necessary for the administration of this Act. Any sums so appropriated shall be available for expenditures for the purchase, hire, maintenance, operation, and exchange of aircraft and other means of conveyance, and for such other expenses as may be necessary to carry out the purposes of this Act. However, unless specifically authorized in other legislation or provided for in appropriations, no part of such sums shall be used to pay the cost or value of property injured or destroyed under section 9 of this Act. Appropriation. 7 USC 2610.

SEC. 12. The provisions of this Act shall not apply to shipments of seed subject to the Federal Seed Act (53 Stat. 1275, as amended; 7 U.S.C. 1551 et seq.) and this Act shall not amend or repeal any of the provisions of said Act or of the Plant Quarantine Act of August 20, 1912 (37 Stat. 315, as amended; 7 U.S.C. 151-154, 156-161a, 167), the Federal Plant Pest Act (71 Stat. 31; 7 U.S.C. 150aa-150jj), or any other Federal laws. Nonapplicability. 7 USC 2611.

SEC. 13. The provisions of this Act shall not invalidate the provisions of the laws of any State or political subdivision thereof, or of any territory or district of the United States relating to noxious weeds, except that no such jurisdiction may permit any action that is prohibited under this Act. 7 USC 2612.

SEC. 14. If any provision of this Act or the application thereof to any person or circumstances is held invalid, the remainder of the Act and the application of such provision to other persons and circumstances shall not be affected thereby. Separability. 7 USC 2613.

Approved January 3, 1975.

APPENDIX F

Idaho Noxious Weed Law

DECISION RECORD AND FINDING OF NO SIGNIFICANT IMPACT FOR THE CONTROL OF NOXIOUS WEEDS ON PUBLIC LANDS IN IDAHO

DECISION

The decision is to authorize the control of noxious weeds on public rangelands in Idaho using the methods outlined in Alternative A (Proposed Action) of the Idaho Noxious Weed Control Environmental Assessment. This will include both the ground and helicopter aerial application of herbicides as well as manual, mechanical, and biological control. Authorization shall be granted in accordance with the following conditions:

--Helicopter herbicide applications must be approved by the Idaho State Director.

--The mitigating measures identified on pp. 13-17 and the buffer zone requirements listed on pp. 11 are adopted.

--The U.S. Fish and Wildlife Service will be consulted pursuant to Section 7 of the Endangered Species Act prior to implementing control measures on a site specific basis.

--Only those herbicides identified in the proposed action will be used. These herbicides are registered by the Environmental Protection Agency. Application rates will not exceed label recommendations.

--Control will be limited to Idaho public rangelands administered by the Bureau of Land Management.

--This decision will be effective through 1985.

--Approximately 3,000 acres will be treated in 1985 based on existing funding levels.

RATIONALE

Noxious weeds infesting public land within the State need to be controlled to comply with both State and Federal laws.

A compelling need exists to control noxious weeds infesting Federally owned lands administered by BLM; to do otherwise would be unfair to adjacent landowners. If these public lands are left untreated, State and county efforts at controlling and eradicating noxious weeds on surrounding non-public land will be rendered ineffective. Noxious weeds have become so thoroughly established and are spreading so rapidly on public and private lands that they pose a serious menace to the public welfare and the State's agricultural economy.

An emergency situation now exists in Idaho and immediate control is necessary to prevent increasing the economic burden on the State, county, and private sectors due to the spread of noxious weeds from public lands into surrounding areas.

The Oregon State Director published in the Federal Register a Notice of Intent to prepare an environmental impact statement on the use of herbicides on public lands. That EIS will be a regional, programmatic document and may include Idaho although the scope of the document has not yet been determined. That EIS effort will not be completed in time for a decision to be reached and implemented this year. The information gained through that EIS effort will be incorporated into the current EA where applicable. This decision may be modified in light of that information.

This decision is consistent with all applicable BLM land use plans.

No inconsistencies with officially adopted plans, programs, or policies of State or local governments or Indian tribes have been identified.

The ground and helicopter aerial application of herbicides for control of noxious weeds on Idaho public lands has been conducted in previous years with no significant adverse environmental effects.

The procedures for destroying the noxious weeds are the same as those followed by the State of Idaho and county weed control officials in treating non-public land.

The human health effects were addressed based on available information. No unacceptable adverse effects are anticipated with implementation of the decision. The information that could be gained from the incomplete and unavailable data regarding impact analysis would probably not contribute substantially to that information which is known and would probably not change the conclusions. The costs (economic and non-economic) of obtaining that missing data would be exhorbitant.

All mitigating measures have been adopted to ensure that environmental impacts will be reduced to acceptable levels.

The other alternatives would not achieve the objective of providing satisfactory control of noxious weeds.

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

A review of the Environmental Assessment for the Idaho Noxious Weed Control has resulted in a finding of no significant environmental impacts. Implementing the decision will not significantly affect the quality of the human environment. Preparation of an environmental impact statement pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969 is not required.

Alan A. Whittekiek
State Director

Feb 22, 1985
Date

NOXIOUS WEED LAW

Title 22, Chapter 24, Idaho Code

22-2440. DECLARATION OF POLICY. Noxious weeds have become so thoroughly established and are spreading so rapidly on public and private lands that they pose a serious menace to the public welfare and the state's economic stability. Therefore, it is hereby established that a coordinated and continuing eradication and control program on noxious weeds is necessary. Responsibility for eradication and control of noxious weed rests not only on the individual landowner and operator, but also on county, state and federal governments. It is the purpose of this chapter to provide the statutory and financial means for the control and eradication of noxious weeds, wherever such noxious weeds occur in this state.

22-2441. DUTY OF PERSONS TO CONTROL THE SPREAD OF AND TO ERADICATE NOXIOUS WEEDS. (1) The primary duty and responsibility for controlling the spread of and for eradicating noxious weeds on private lands rests on the person who owns or controls the land.

(2) The primary duty and responsibility for controlling the spread of and for eradicating noxious weeds on the lands, lakes, reservoirs, ditches and water courses, and all rights-of-way appurtenant thereto, of drainage districts, irrigation districts, and canal companies rests on the drainage district, irrigation district, or canal company. All noxious weed control expenses shall be a proper maintenance expense of the district or canal company.

(3) The primary duty and responsibility for controlling the spread of and for eradicating noxious weeds on the lands and rights-of-way of highway districts, good road districts, and county highway systems, rests on the administering district or county. All noxious weed control expenses shall be a proper highway maintenance expense of the district or county system.

(4) The primary duty and responsibility for controlling the spread of and for eradicating noxious weeds on public lands, including cities, within a county, other than lands owned or controlled by the state or federal government, and other than those lands or areas for which responsibility is assigned by subsections (2) and (3) of this section, rests on the county.

(5) The primary duty and responsibility for preventing and controlling the spread of and for eradicating noxious weeds on state lands rests on the state. To the extent possible, all noxious weed control expenses shall be considered a regular maintenance and operating expense of the administering agency.

22-2442. DEFINITIONS. As used in this chapter:

(1) "Agency" means:

(a) In the case of the federal government, any authority which exercises administrative control over defined areas of federal property within the state of Idaho;

(b) In the case of the state of Idaho, any department, board, commission, or institution which exercises administrative control over lands owned or controlled by the state, whether by fee simple ownership, lease, rights-of-way, or easements; and shall include, without being limited to, the department of correction, the department of fish and game, the transportation department, the department of lands, the department of parks and recreation, and the department of water resources.

(2) "Control", "controlled" or "controlling" includes being in charge of or being in possession, whether as owner, lessee, renter, tenant, or holder of an easement, whether under statutory authority or otherwise.

(3) "Director" means the director of the department of agriculture.

(4) "Environment" includes water, air land, all plants, man and other animals living therein, and the interrelationships which exist among these.

(5) "Land" means all land and water areas, including air space, and all plants, animals, structures, buildings, contrivances, and machinery appurtenant thereto or situated thereon, fixed or mobile, including any used for transportation.

(6) "Noxious weed" means any plant which is determined by the director to be injurious to public health, crops, livestock, land or other property.

(7) "Control authority" means:

(a) On the state level, the director of the department of agriculture;

(b) On the county level, the board of county commissioners, or the board of directors of a weed control district.

(8) "Applicable fund or account" means:

(a) In the case of the state of Idaho, the noxious weed account, which is hereby created and established in the dedicated fund and which shall be used exclusively for the purposes prescribed by this chapter;

(b) In each county, the noxious weed fund, which is hereby created and established and shall be maintained in each county and which shall be used exclusively for the purposes prescribed by this chapter.

(9) "Person" means any individual, partnership, firm, corporation, company, society, association, the state or any department, agency or subdivision thereof, drainage district, irrigation district, highway district, good road district, or any other entity.

(10) "Weed prevention" is the process of forestalling the contamination of an area by a noxious or objectionable plant species. Prevention includes the measures taken to forestall or hinder the introduction and establishment of a specific plant species in areas not currently infested with those weed species. Such areas may be local, regional, or statewide in scope.

(11) "Weed control" is the process of containing and limiting weed infestations.

(12) "Weed eradication" is the process designed to provide for the complete elimination of all live plants, plant parts, and seeds of the target species from an area.

22-2443. ENFORCEMENT OF CHAPTER VESTED IN DIRECTOR -- POWERS AND DUTIES.

(1) (a) The duty of enforcing this chapter and carrying out its provisions is vested in the director, and the control authorities designated in this chapter acting under the supervision and direction of the director. The director shall determine what weeds are noxious for the purposes of this chapter, and shall compile and keep current a list of such noxious weeds, which list shall be published and incorporated in the rules and regulations of the director. The director shall, from time to time, adopt and publish methods as official for con-

trol and eradication of noxious weeds and make and publish such rules and regulations as in his judgment are necessary to carry out the provisions of this chapter.
(b) The director is authorized to investigate the subject of noxious weeds; to require information, annual work plans, and reports from each county as to the presence of noxious weeds and other information relative to noxious weeds and the control and eradication thereof; to cooperate in carrying out other acts administered by him; to cooperate with agencies of federal and state governments and persons in carrying out his duties under this chapter, and, with the consent of the governor, in the conduct of investigation outside this state in the interest of the protection of the economic activities of this state from noxious weeds not generally distributed therein; with the consent of the federal agency involved, to control and eradicate noxious weeds on federal lands within this state, with or without reimbursement, when deemed by him to be necessary to an effective weed control and eradication program; to advise and confer as to the extent of noxious weed infestations and the methods determined best suited to the control and eradication thereof; to call and attend meetings and conferences dealing with the subject of noxious weeds; to disseminate information and conduct educational campaigns in cooperation with the University of Idaho's extension service, and others with respect to the prevention, control, and eradication of noxious weeds; to procure materials and equipment and employ personnel necessary to carry out his duties and responsibilities; and to perform such other acts as may be necessary or appropriate to the administration of this chapter.
(c) When determined by the director that a county has failed to carry out any of its duties and responsibilities as a control authority, the director may request that the attorney general bring an action in the district court against the control authority to require compliance with the provisions of this chapter.
(d) The director is authorized to investigate the subject of noxious weeds, to require information, annual work plans, and reports from each state department, board, commission, or institution which exercises administrative control over lands owned or controlled by the state. The annual work plans shall be submitted to the director and the respective county control authority within those particular areas of jurisdication.
(e) The director shall have the responsibility of cooperating with the federal government in planning, coordinating and executing a meaningful program of weed control on indigenous federal land. To the extent possible, all noxious weed control expenses should be considered a regular maintenance and operating expense of the administrating federal agency.

22-2443A. ENFORCEMENT OF WEED CONTROL IN COUNTY -- COUNTY-WIDE WEED DISTRICT. (1) Each county shall carry out the duties and responsibilities vested in it under this chapter with respect to land under its jurisdiction, in accordance with rules and regulations prescribed by the director. Such duties shall include the establishment of a coordinated program for prevention, control, and eradication of noxious weeds within such county. Each county shall exercise its authority and responsibility through the board of county commissioners. If at any time the board of county commissioners has failed to carry out its responsibilities, the director shall proceed as provided in section 22-2443(c), Idaho Code; or if the board of county commissioners has failed for a period of sixty (60) days to carry out any program ordered by the director, the provisions of subsection (2) of this section shall apply.

(2) The board of county commissioners may initiate the organization of a county-wide weed district on its own motion or shall provide for the organization of a county-wide weed district within thirty (30) days after presentation of a petition signed by not less than fifty (50) resident real property holders of said county.

(a) If a petition is prepared, it shall be presented to the county clerk and recorder, and the petition shall be signed by not less than fifty (50) of the resident real property holders of the county. The area of the district shall be the same as the county.
(b) Upon the filing of the petition, the county clerk shall examine the petition and certify whether the required number of petitioners have signed. If the number of petition signers is sufficient, the clerk shall transmit the petition to the board of county commissioners.
(c) Upon receipt of a duly certified petition, the board of county commissioners shall give notice of an election to be held in the county for the purpose of determining whether or not the proposed district shall be organized and to elect five (5) persons to be the first board of directors for the district. Such notice shall include the date and hours of the election, the polling places, and the names and terms of five (5) persons to be elected to the first board of directors. The names and terms of the persons to be elected to the first board of directors shall be determined by the board of county commissioners. The terms shall be staggered so that two (2) terms shall expire on January 1, following the general election occurring next after the organization of the district, and three (3) terms shall expire on January 1, following the second general election occurring after the organization of the district. The notice shall be published once each week for three (3) consecutive weeks prior to such election in a newspaper of general circulation in the county. The election to establish a county-wide weed district may be conducted at any general election.
(d) The election shall be held and conducted as nearly as may be in the same manner as a general election in this state, except that electors need not be registered in order to vote in such election. The board of county commissioners shall appoint three (3) judges, one (1) of whom shall act as clerk for the election. Each elector may be required to take an oath that he is a resident of the county, and otherwise possesses all the qualifications of an elector before casting his vote. At such election, the electors shall vote for or against the organization of the district, and the members of the first board of directors.
(e) The judges of election shall certify the returns of the election to the board of county commissioners. If a majority of the votes cast at said election are in favor of the organization, the board of county commissioners shall declare the district organized, and shall further designate the first board of direc-

tors elected.

(f) At the general election occurring next after the organization of a county-wide weed district, and at each general election thereafter, there shall be elected the number of directors of the district whose terms expire on the following January 1. The term of an elected director shall be four (4) years, commencing on January 1, next following election. Vacancies in the office of an elected director shall be filled by appointment of the board of county commissioners for the balance of the term.

(g) Not later than sixty (60) days prior to a general election, nomination may be filed with the county clerk and recorder, and if a nominee does not withdraw his name before the first publication of the notice of election, his name shall be placed on the ballot, separate and distinct from all other contests to be voted on at the general election. The conduct of and the results of such election shall be governed by the laws applicable to general election.

(h) The board of directors of a county-wide weed district shall conduct the affairs of the district, and their authority and responsibility shall be the same as that conferred upon a board of county commissioners by the provisions of this chapter. The board of directors shall receive such compensation and expenses as are fixed by the board of county commissioners.

(i) At the same time as the board of county commissioners gives notice of an election for the organization of a county-wide weed district, the board of county commissioners may require that the petitioners file a bond with the county auditor in an amount sufficient to cover the costs of the election. The county auditor shall estimate the amount of such costs, and the election need not be conducted if such bond has been ordered by the board of county commissioners but has not been filed with the county auditor. The bond shall be made payable to the county noxious weed fund, but shall be enforced only if moneys in the noxious weed fund are insufficient to pay the costs of the election, and then only so much as is necessary to pay the balance of costs not paid from the moneys available in the fund. All costs for all other elections for a county-wide weed district shall be a proper charge against the noxious weed fund.

(3) A county may cooperate with any person or with the federal government in carrying out its duties and responsibilities under this chapter, and shall cooperate with the director in carrying out other acts administered by him.

(4) (a) Each county shall employ one or more weed control superintendents who shall be certified by the director to be qualified to detect and treat noxious weeds. The same person may be a weed control superintendent for more than one (1) county control authority. Such employment may be for such tenure, and at such rates of compensation and reimbursement for travel expenses, as the county may prescribe, and without regard to any provisions of law relating to age or dual compensation.

(b) Under the direction of the employing county, it shall be the duty of every weed control superintendent to examine all land within the county for the purpose of determining whether the provisions of this chapter and regulations of the director have been complied with; he shall compile such data on infested areas and areas eradicated and such other reports as the director or county may require; consult and advise upon matters pertaining to the best and most practical methods of noxious weed prevention, control, and eradication, and render assistance and direction for the most effective prevention, control, and eradication; investigate or aid in the investigation and prosecution of any violation of this chapter; assist the county assessor as provided in this chapter; and perform such other duties as required by the county in the performance of its duties. Weed control superintendents shall cooperate and assist one another to the extent practicable. County weed control superintendents shall supervise the carrying out of the coordinated prevention, control and eradication program within the county.

(5) Upon formation of a county-wide weed district, all rights, title and interest in lands and personal property owned by the county for weed control purposes shall be transferred to and thereafter be vested in the board of directors of the weed district, and control over all moneys in the noxious weed fund shall be transferred to the board of directors. Upon dissolution of a county-wide weed district, all rights, title and interest in lands and personal property owned by the district for weed control purposes shall be transferred to and thereafter be vested in the board of county commissioners, and control over all moneys in the noxious weed fund shall be transferred to the board of county commissioners.

22-2444. NOTICES FOR CONTROL AND ERADICATION OF NOXIOUS WEEDS -- EFFECT. (1) Notices for control and eradication of noxious weeds shall consist of two (2) kinds: notice of an annual public meeting and individual notices, of a form prescribed by the director. Failure to publish the notice of an annual public meeting or serve individual notices herein provided does not relieve any person from the necessity of full compliance with this chapter and regulations thereunder. In all cases said published notice shall be deemed legal and sufficient notice.

The notice of an annual public meeting shall be published by each county in one or more newspapers of general circulation throughout the area, or areas, over which the county has jurisdiction, at least once a week for two (2) weeks, on or before February 1 of each year, and shall state that the weed program for the year, with associated costs, will be the subject of the meeting. The annual meeting shall be held during the month of February.

Whenever any county finds it necessary to secure more prompt or definite prevention, control, or eradication of noxious weeds than is accomplished by the notice of an annual public meeting, it shall cause individual notices to be served upon the person owning and the person controlling such land, giving specific instructions and methods when and how certain named weeds are to be prevented, controlled, or eradicated. The individual notice shall also contain information concerning the right to appeal pursuant to section 22-2452, Idaho Code.

(2) (a) Whenever the owner or person in control of private land on which noxious weeds are present has neglected or failed to initiate control or eradication as required pursuant to this chapter within five (5) working days from receipt of an individual notice given pursuant to this section, the county having jurisdiction shall have proper control and eradication methods used on such land, including necessary destruction of growing crops, and shall advise the owner and person in control of the cost incurred in

(2) Disbursements from the noxious weed fund shall be made for the purpose of paying for materials, freight and drayage on materials, rental or purchase of equipment, personal services for weed prevention, control, and eradication purposes, and any other incidental charges that may be necessary for the promotion of weed control work within the county.

(3) Reimbursements or repayments to the noxious weed fund resulting from the sale of materials or services shall be available for expenditure at any time.

22-2455. WEED CONTROL ADVISORY COMMITTEES. (1) The board of county commissioners in each county may appoint a county weed control advisory committee, consisting of not less than five (5) members, who shall be persons knowledgeable of and concerned about the damage done by noxious weeds.

It shall be the duty and responsibility of each county weed control advisory committee to assist the board of county commissioners and the weed control superintendent in carrying out the planning and implementation of noxious weed prevention, control, and eradication programs, to act as liaison to other county weed control advisory committees, and to provide a forum for public input on matters relating to the prevention, control, and eradication of noxious weeds.

The members of the county advisory committee shall be apointed for terms of four (4) years, which shall expire on the second Monday of January following each gubernatorial election, and appointments to fill vacancies shall be for the unexpired term.

Members of the county advisory committee may be reimbursed for actual and necessary expenses when on committee business. All expense payments shall be made from the noxious weed fund.

22-2456. EMERGENCY PROCEDURES FOR ERADICATION OF NOXIOUS WEEDS. (1) Whenever the director finds, upon the advice of the county weed control advisory committee or the county supervisor, that an emergency situation exists, whether actual or potential, concerning noxious weed infestations anywhere in the state, he may take any appropriate action necessary to prevent, control, eradicate, quarantine, or limit the spread of such noxious weed infestation.

(2) Whenever the weed control superintendent finds, upon the advice of the county weed control advisory committee, if any, or with the approval of the county control authority, that an emergency situation exists, whether actual or potential, concerning noxious weed infestations anywhere in the county, he may take any appropriate action necessary to prevent, control, eradicate, quarantine, or limit the spread of noxious weed infestations.

22-2457. DEFICIENCY WARRANTS FOR EXCESS COSTS OF WEED CONTROL. In the event the actual cost for the prevention, control, or eradication of noxious weeds in any one (1) year under the provisions of section 22-2456(1), Idaho Code, exceeds the appropriations made for that purpose, the director may authorize the issuance of deficiency warrants for the purposes of defraying such excess costs and when so authorized the state auditor shall, after notice to the state treasurer, draw deficiency warrants against the general account.

22-2458. REPEALED.

22-2459. REPEALED.

22-2460. REPEALED.

22-2461. REPEALED.

22-2462. VIOLATIONS -- PENALTIES. (1) Any person knowing of the existence of any noxious weeds on land owned or controlled by him who fails to control or eradicate such weeds in accordance with this act and rules and regulations prescribed thereunder, and any person who intrudes upon any land under quarantine or who moves or causes to be moved any article covered by this act except as provided or who prevents or threatens to prevent entry upon land as provided in this act, or who interfered with the carrying out of the provisions of this act, shall be guilty of a misdemeanor and shall be subject to a fine not to exceed three hundred dollars ($300.00) on account of each violation.

(2) Any control authority, and where such control authority is composed of more than one (1) person, each member of such control authority, and any weed control superintendent, who shall fail and refuse to perform the duties required of him by this act and rules and regulations thereunder shall be subject to a civil fine not to exceed five hundred dollars ($500.00) on account of each violation. The director or a control authority may bring an action to enforce this act, and the penalty provided for under this provision.

(3) Any person who violates any of the provisions of this act, or the regulations made under this act, shall be guilty of a misdemeanor.

58-140. SPECIAL ACCOUNT FOR THE MAINTENANCE, MANAGEMENT AND PROTECTION OF STATE OWNED TIMBER, GRAZING AND RECREATION SITE LANDS. A reasonable amount not to exceed ten per centum (10%) of the moneys received from the sale of standing timber, from grazing leases and from recreation site leases shall constitute a special account, which is hereby created to be used for maintenance, management and protection of state owned timber lands, grazing lands and recreation site lands: provided, that any moneys constituting part of such account received from a sale of standing timber or from leases of lands which are a part of any endowment land grant shall be used only for the maintenance, management and protection of lands of the same endowment grant. Provided further, that all such funds collected from timber sales shall be expended for the maintenance, protection and improvement of both new lease sites, and existing recreation areas situate on state lands. All such funds collected from grazing leases shall be expended for the maintenance, management and protection of state owned grazing lands. Control and eradication of noxious weeds is a part of the maintenance, protection and improvement programs.

The state board of land commissioners is hereby authorized to establish rules and regulations fixing a percentage of the amount received from each sale of standing timber and from each grazing and recreation site lease, not to exceed ten per centum (10%) of the total, which shall constitute the special account herein created. The account shall be deposited with the state treasurer, who shall keep a record thereof which shall show separately

moneys received from each category of endowment lands. All moneys deposited in the account are hereby appropriated continually to the state board of land commissioners for the purposes hereinabove enumerated.

Additionally, the state board of land commissioners is hereby authorized to contract with the state department of agriculture, or with any county, to provide programs of noxious weed control or eradication on state lands, and may utilize such resources as are available to the board for such purposes.

APPENDIX G

Herbicide Labels

FORMULA 40*

Herbicide

A unique herbicidal formulation *guaranteed*† to control many kinds of annual and perennial broadleaf weeds in crop and non-crop areas.

FORMULA 40* Herbicide is a unique formulation of alkanolamine salts of 2,4-D, *guaranteed*† to provide "satisfactory control" of a wide variety of annual and perennial broadleaf weeds in such non-crop areas as established grass pastures and rangelands, drainage ditch banks, roadsides, and fencerows, and in croplands planted to barley, oats, rye, wheat, corn, sorghum (milo), rice, and sugar cane. FORMULA 40 is low-foaming, stable in hard or soft water, has little or no odor, and can be easily applied undiluted, mixed with liquid fertilizer, or in simple water solutions, using conventional ground or aerial equipment. It may also be used in injection applications to control unwanted hardwood trees, such as elm, hickory, oak, and sweetgum.

Active Ingredients:

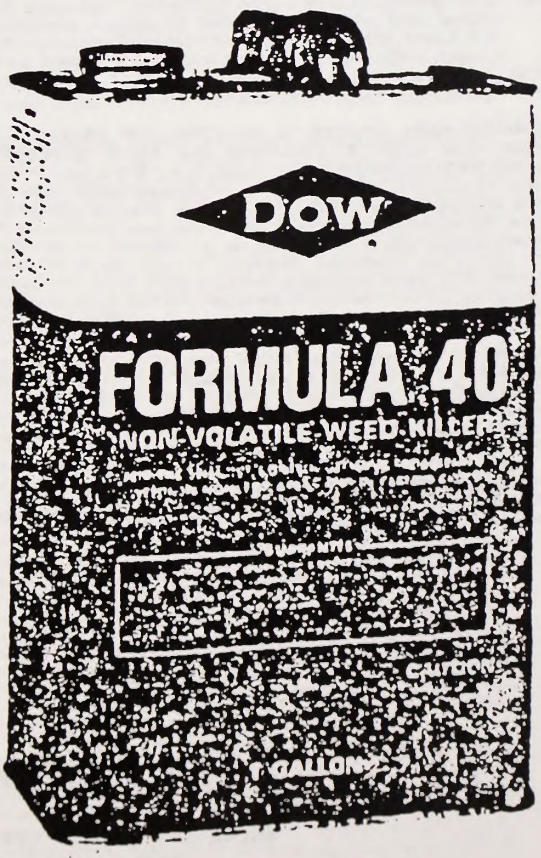
Alkanolamine salts (of the ethanol and isopropanol series) of 2,4-dichlorophenoxyacetic acid. 59.7%
(2,4-D acid equivalent: 38.6% — 4 lbs. per gal.)

Inert Ingredients: 40.3%

E.P.A. Registration No. 464-1-AC

NOTE: READ AND FOLLOW CAREFULLY ALL CURRENT LABEL DIRECTIONS AND PRECAUTIONS.

*Trademark of The Dow Chemical Company
†See product label for terms of guarantee



CONTAINS ALKANOLAMINE SALTS OF 2,4-D

Acid Equivalent: 4 Pounds per Gallon

AMOUNT OF FORMULA 40 TO USE IN CROPS
by air or ground application

NOTE: Do not apply when weather conditions favor drift from treated areas. Read complete directions and precautions before using.

CROP	DOSAGE PER ACRE	
	Normal rates (usually safe to crop)	Higher rates for special situations[2] (more likely to injure crop)
SMALL GRAINS		
spring postemergence		
wheat, barley, rye	⅓ to 1½ pints	2 to 3 pints
oats	½ to 1 pint	1½ to 2 pints
preharvest (dough stage)		
wheat, barley, oats	1 to 2 pints	2 to 3 pints
CORN[1]		
preemergence	2 to 4 pints	
emergence[1]	1 pint	1½ pints
postemergence[1]		
up to 8 inches tall	½ to 1 pint	
8 inches to tasseling (use only directed spray)	1 pint	1½ to 2½ pints
SORGHUM (milo)[1]		
postemergence		
6 to 8 inches tall	⅔ to 1 pint	
8 to 15 inches tall (use only directed spray)	1 pint	1½ to 2 pints
RICE	1 to 2½ pints	2 to 3 pints
SUGAR CANE	2 to 4 pints	

[1] Corn and sorghum varieties vary in tolerance to 2,4-D; some are easily injured. Before spraying, get information on 2,4-D tolerance of specific varieties and spray only those known to be resistant to 2,4-D injury. If plants are more than 8 inches tall, use directed spray and keep spray off corn and sorghum foliage.

[2] These higher rates may be needed to handle difficult weed problems in certain areas such as under dry conditions especially in western areas. However, do not use unless possible crop injury will be acceptable. Consult State Agricultural Experiment Station or Extension Service weed specialists for recommendations or suggestions to fit local conditions.

WEED CONTROL IN ESTABLISHED GRASS PASTURES AND RANGELANDS: Use at 2 to 4 pints per acre. Apply preferably when weeds are small and growing actively before the bud stage. Do not use on bentgrass, alfalfa, clover, or other legumes. Do not use on newly seeded areas until grass is well established. Do not use from early boot to milk stage where grass seed production is desired. Do not graze dairy animals on treated areas within 7 days after application.

GRASS SEED CROPS: Use 1 to 4 pints per acre in spring or fall to control broadleaf weeds in grass being grown for seed. Do not apply from early boot to the milk stage. Spray seedling grass only after the five-leaf stage, using ⅜ to 1 pint per acre to control small seedling weeds. After the grass is well-established, higher rates up to 4 pints, can be used to control hard-to-kill annual or perennial weeds. For best results, apply when soil moisture is adequate for good growth. NOTE: Do not use on bentgrass unless grass injury can be tolerated. Do not graze dairy animals nor cut forage for hay within 7 days after application.

BROADLEAF WEED CONTROL IN NON-CROPLAND GRASS AREAS SUCH AS LAWNS, GOLF COURSES, CEMETERIES AND PARKS, AIRFIELDS, ROADSIDES, VACANT LOTS, DRAINAGE DITCH BANKS: Use 1 to 3 quarts of FORMULA 40 per acre in the amount of water needed for uniform application. Treat when weeds are young and growing well. Usually 2 quarts per acre will provide adequate weed control. Do not use on dichondra or other herbaceous ground covers. Do not use on creeping grasses such as bent except for spot treating nor on freshly seeded turf until grass is well established. Reseeding of lawns should be delayed following treatment. With spring application, reseed in the fall; with fall application, reseed in the spring. Legumes are usually damaged or killed. Deep-rooted perennial weeds such as bindweed and Canada thistle may require repeated applications.

CONTROL OF SOUTHERN WILD ROSE: On rangelands, roadsides and fence rows use 1 gallon of FORMULA 40 plus 4 to 8 fluid ounces of an agricultural surfactant per 100 gallons of water and spray thoroughly as soon as foliage is well developed. Two or more treatments may be required. On rangeland, apply a maximum of 6 quarts of FORMULA 40 per acre per application. Do not graze dairy animals on treated areas within 7 days after application.

SPOT TREATMENT IN NON-CROP AREAS: To control broadleaf weeds in small areas with a hand sprayer, use ⅛ pint of FORMULA 40 in 3 gallons of water and spray to thoroughly wet all foliage.

TREE INJECTION TREATMENT: To control unwanted hardwood trees such as elm, hickory, oaks and sweetgum in forest and other non-crop areas, apply FORMULA 40 herbicide by injecting 1 ml of the undiluted product through the bark around the trunk at intervals of 1 to 3 inches between edges of the injector wounds. For harder to control species such as ash, maples and dogwood use 2 ml of undiluted FORMULA 40 per injection site. Continuous cuts around the trunk often provide improved control. Also, cuts near the ground level may be more effective than at higher levels. Treatments can be made at any season; however, effectiveness may be less during winter months. Maples should not be treated during the spring sap flow.

USE PRECAUTIONS

Do not apply FORMULA 40 herbicide directly to, or otherwise permit it to come into contact with cotton, flowers, fruit trees, grapes, ornamentals, vegetables or other desirable plants which are sensitive to 2,4-D herbicides and do not use in a greenhouse. Do not permit spray mist containing it to drift onto them, since even very small quantities of the spray, which may not be visible, can cause severe injury during both growing and dormant periods. Use coarse sprays to minimize drift. With ground equipment, spray drift can also be minimized by keeping the spray boom as low as possible, by applying 20 gallons or more of spray per acre, by using no more than 20 pounds per square inch spraying pressure, by using flat fan or flood fan nozzle tips, and by stopping all spraying when wind velocity exceeds 8 miles per hour. Do not apply using cone-type insecticide or other nozzles that produce a fine-droplet spray. With aircraft application, drift can be lessened by using no more than 20 pounds spray pressure at the nozzles; by using nozzles which produce a coarse spray pattern; and by spraying only when the wind velocity is less than 5 miles per hour. Applications by airplane, ground rigs and hand dispensers should be carried out only when there is no hazard from drift. Do not apply in the vicinity of cotton, grapes, tomatoes, or other desirable vegetation susceptible to 2,4-D. Do not spray when the wind is blowing across the area to be sprayed towards susceptible crops or ornamental plants. Violent windstorms may move soil particles. If 2,4-D is on these particles and they are blown onto susceptible plants, visible symptoms may appear. Serious injury is unlikely. The hazard of movement of 2,4-D on dust is reduced if treated fields are irrigated or if rain occurs shortly after application. Do not contaminate irrigation ditches or water used for irrigation or domestic purposes. Do not store near fertilizers, seeds, insecticides or fungicides. To avoid injury to desirable plants, do not store, handle or apply other agricultural chemicals with the same containers or equipment used for FORMULA 40 except as specified on this label. Excessive amounts of 2,4-D in the soil may temporarily inhibit seed germination or plant growth.

Local conditions may affect the use of herbicides. State Agricultural Experiment Stations or Extension Service weed specialists in many states issue recommendations to fit local conditions.

Be sure that use of this product conforms to all applicable regulations. Apply this product only as specified on this label.

NOTE: FORMULA 40 herbicide, exposed to subfreezing temperatures, should be warmed to at least 40 F and mixed thoroughly before using.

Rinse equipment and containers and dispose of wastes by burying in non-crop areas away from water supplies. Containers should be disposed by punching holes in them and burying with wastes. Follow local disposal regulations where required.

CAUTION

KEEP OUT OF REACH OF CHILDREN
HARMFUL IF SWALLOWED
CAUSES IRRITATION OF SKIN AND EYES
Do Not Get in Eyes, on Skin or on Clothing

In case of contact, flush eyes with plenty of water for at least 15 minutes and get medical attention; wash skin with soap and plenty of water. Remove and wash contaminated clothing before re-use. Do not wear contaminated shoes.

NOTICE: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purpose stated on the label when used in accordance with directions under normal conditions of use, but neither this warranty nor any other warranty of MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the use of this product contrary to label instructions or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes the risk of any such use. Q973

MONEY BACK GUARANTEE

FORMULA 40 herbicide is guaranteed by The Dow Chemical Company to the full extent of the purchase price:

1. To give satisfactory control of weeds listed on container when used as recommended.
2. To form a suitable spray mixture in any water fit for spray use.

THE DOW CHEMICAL COMPANY
AND SUBSIDIARIES
MIDLAND MICHIGAN 48640 USA ZURICH SWITZERLAND HONG KONG BCC
CORAL GABLES FLORIDA 33134 USA SARNIA ONTARIO CANADA

FORMULA 40*
HERBICIDE

For the Selective Control of Many Broadleaf Weeds in Non-Crop Areas, Grass Pastures, Rangelands and in Certain Crops. Also for Control of Trees by Injection.

SPECIMEN LABEL

ACTIVE INGREDIENTS:

Alkanolamine Salts (of the Ethanol and Isopropanol series) of 2,4-Dichlorophenoxyacetic acid	59.7%
2,4-Dichlorophenoxyacetic Acid Equivalent	38.6%
INERT INGREDIENTS:	40.3%

E.P.A. Registration No. 464-1-AC

Salts are the least volatile forms of 2,4-D and do not release enough vapors from treated areas to reduce yield of adjacent susceptible crops

WEED LIST

FORMULA 40 herbicide is recommended for control of numerous broadleaf weeds and certain 2,4-D susceptible woody perennials without injuring most grasses. Species controlled include the following plus many others:

bitterweed	flixweed	morningglory, annual	ragweed, common	sweetclover
broomweed	gelintage	mustards	rape, wild	tansymustard
burdock	hemp, wild	pennycress	rocket, yellow	thistle, bull
carpetweed	jewelweed	pennywort	shepherdspurse	thistle, musk
carrot, wild	jimsonweed	pepperweed	sickleped	thistle, Russian
chicory	kochia	pigweed	smartweed	tumbleweed
cocklebur	lambsquarters	plantains	sneezeweed, bitter	velvetleaf
coffeeweed	lace, bigband	poorjoe	sowthistle, annual	vetch
croton	lupines	pursley, Florida	spanishneedles	waterplantain
dandelion	mallow, Venice	radish, wild	sunflower	witchweed
dock	marshelder			wormseed

USE DIRECTIONS

Generally, the lower dosages given will be satisfactory for young, succulent growth of sensitive weed species. For less sensitive species and under conditions where control is more difficult, the higher dosages will be needed. Apply FORMULA 40 during warm weather when weeds are young and growing actively. Use enough spray volume for uniform coverage by ground or air application. If only bands or rows are treated, leaving middles unsprayed, the dosage per crop acre is reduced proportionately. **Do not apply where spray drift may be a problem due to proximity of susceptible crops or other desirable plants. Read and follow all Use Precautions given on this label.**

To Prepare the Spray, mix FORMULA 40 only with water, unless otherwise directed on this label. Add about half the water to the mixing tank, then add the FORMULA 40 with agitation, and finally the rest of the water with continuing agitation. Note: Adding oil, wetting agent or other surfactant to the spray may increase effectiveness on weeds, but also may reduce selectivity to crops resulting in crop damage.

Use with Liquid Fertilizer: FORMULA 40 may be combined with liquid fertilizer suitable for foliar application to accomplish weeding and feeding of corn, small grains, sorghum and grass pastures in one operation. Use FORMULA 40 in accordance with recommendations for these crops given in the following text and table. Use liquid fertilizer at rates recommended by supplier or local extension service specialist. To prepare the spray, FORMULA 40 must first be premixed with water. For liquid nitrogen fertilizer use a premix consisting of 1 part of FORMULA 40 and 4 parts of water; for other liquid fertilizers use 1 part of FORMULA 40 with 50 to 60 parts of water. Add the premix to the fertilizer while maintaining continuous agitation during both mixing and spraying operations. Apply the spray the same day it is prepared, **do not store. Note: Always premix FORMULA 40 with water before adding to the liquid fertilizer.**

WEED CONTROL IN SMALL GRAINS NOT UNDERSEEDED WITH A LEGUME (Barley, Oats, Rye, Wheat): See Table for recommended use rates. Spray after grain begins tillering and before the boot stage (usually 4 to 8 inches tall) and weeds are small. **Do not apply before the tiller stage nor from early boot through the milk stage.** To control weeds that will interfere with harvest or to suppress perennial weeds, preharvest treatment can be applied when the grain is in the dough stage. Best results will be obtained when soil moisture is adequate for plant growth and weeds are growing well. Note: Do not permit dairy animals or meat animals being finished for slaughter to forage or graze treated grain fields within 2 weeks after treatment. Do not feed treated straw to livestock.

WEED CONTROL IN CORN: See Table for recommended use rates. **Preemergence** – Apply to soil anytime after planting but before corn emerges. Do not use on very light, sandy soil. **Emergence** – Apply just as corn plants are breaking ground. **Postemergence** – Apply to emerged corn. When corn is over 8 inches tall use drop nozzles to keep spray off corn foliage. Do not apply from tasseling to dough stage. Injury to corn is most likely to occur if FORMULA 40 is applied when corn is growing rapidly under high temperature and high soil moisture conditions. In such situations, use the low rate of ½ pint per acre. After application, delay cultivation for 8 to 10 days to allow the corn to overcome any temporary brittleness. NOTE: Hybrids vary in tolerance to 2,4-D. Some are easily injured. Spray only varieties known to be tolerant to 2,4-D. Consult the seed company or your Agricultural Experiment Station or Extension Service Weed Specialist for this information.

WEED CONTROL IN SORGHUM (MILO): See Table for recommended use rates. Treat only after the sorghum is 6 inches high and preferably before it is 15 inches high. Do not treat during the boot, tasseling or early dough stages. Reduce spray drift by keeping the boom and spray nozzles as low as possible. If crop is taller than 8 inches, use drop nozzles to keep the spray off the leaves. Temporary crop injury can be expected under conditions of high soil moisture and high air temperatures. If it is necessary to apply FORMULA 40 under these conditions, use no more than ⅓ pint per acre. NOTE: Hybrids vary in tolerance to 2,4-D. Some are easily injured. Spray only varieties known to be tolerant to 2,4-D. Consult the seed company or your Agricultural Experiment Station or Extension Service Weed Specialist for this information.

WEED CONTROL IN RICE: See Table for recommended use rates. Apply in the late tillering stage of rice development, at the time of first joint development (first to second green ring), usually 6 to 9 weeks after emergence. Do not apply after panicle initiation, after rice internodes exceed ½ inch, at early reedling, early panicle, boot, flowering or early heading growth stages. NOTE: Some rice varieties under certain conditions can be injured by 2,4-D. Therefore before spraying consult local Extension Service or University specialists for appropriate rates and timing of 2,4-D sprays.

WEED CONTROL IN SUGARCANE: See Table for recommended use rates. Apply as a preemergence or postemergence spray in accordance with State recommendations. For grass control, use DOWPON® or Dow Sodium TCA grass herbicides in addition to FORMULA 40. Always read the label directions and precautions for the use of these products before using them with FORMULA 40.

Weedone® LV 6

UNION CARBIDE

Emulsifiable Broadleaf Herbicide

Weed and brush control in small grains, field corn, rangeland, pastures, roadsides and fencerows.

KEEP OUT OF REACH OF CHILDREN
CAUTION

ACTIVE INGREDIENT:		INERT INGREDIENTS:	16.5%
2,4-Dichlorophenoxyacetic acid, butoxyethyl ester*	83.5%	*2,4-Dichlorophenoxyacetic acid equivalent 5.7 lb./gal. or 57.5%/wt.	
		*Isomer specific by AOAC method No. 6.D01-5	

EPA Reg. No. 264-271-AA

DIRECTIONS FOR USE

IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.

WEEDS IN CROPS	AMOUNT PER ACRE	DIRECTIONS
Field corn		
Preemergence	1 1/3 - 2 pints	To control broadleaf weeds and suppress annual grasses, apply 3 to 5 days after planting but before corn emerges. Use high rate on soil high in organic matter or clay. Do not use on light sandy soil or when soil moisture is inadequate for normal weed growth.
At emergence (spike)	2/3 pint	Treat just as plants are breaking ground.
Postemergence		
Annual broadleaf weeds	1/3 pint	Apply when weeds are small and corn is less than 10" tall. Avoid spraying just after corn leaves unfold as injury may occur. If corn more than 10" tall must be sprayed, use drop pipes.
Perennial broadleaf weeds	1 pint	Spray when weeds are in the bud to bloom stage. If corn is more than 10" tall use drop pipes to keep spray off corn leaves. Do not spray corn from tassel to dough stage. 2,4-D may cause brittleness to corn. Winds or cultivation may cause stalk breakage while brittle. Certain single cross hybrids may be more susceptible to 2,4-D injury than other varieties.
Preharvest (brown silk)	2/3 - 1 1/3 pint	Apply with air or ground equipment after the hard dough (denting) stage to suppress weeds that interfere with harvest such as bindweed, cocklebur, dogbane, jimsonweed, ragweed, sunflower and velvetleaf, and to decrease production of weed seeds. The high rate will be needed for tough weeds under stress.
Spring seeded wheat, barley, rye (not underseeded with legumes)		
Annual broadleaf weeds	1/3 pint	Spray after grain is fully tillered (about 4 to 6 inches tall) but before it is in the boot stage.
Perennial broadleaf weeds	1/3 - 1 1/3 pint*	Spray after grain is fully tillered (about 4 to 6 inches tall) and when weeds are nearing the bud stage. Do not spray grain in the boot to dough stage.
Fall seeded wheat, rye (not underseeded with legumes)	1/3 - 1 1/3 pint*	Spray in the spring before grain is in the boot to dough stage.

Use the lower rate if small annual and biennial weeds are the major problem. Use the higher rate if perennial weeds or annual and biennial weeds are present which are in the hard to kill categories as determined by local experience. The higher rates increase the risk of injury and should be used only where the weed control problem justifies the grain damage risk. Do not forage or graze treated grain fields within two weeks after treatment with this product.

For aerial application to small grains, preharvest corn, pastures or rangeland, use the recommended amount of this product in 2 to 10 gallons of water per acre.

WEEDS AND BRUSH IN FALLOW LAND, RANGELAND, PASTURES, ROADSIDES, FENCEROWS

Annual broadleaf weeds	1 1/3 - 2 2/3 pints	Spray when weeds are young and growing vigorously. Controls cocklebur, galinsoga, lambsquarters, mustards, pigweed, ragweed, sunflower.
Biennial and perennial broadleaf weeds	2 2/3 - 4 pints	Spray when weeds are actively growing and near the bud stage. Repeat applications may be needed for complete control. Controls bindweed, Canada thistle, chicory, dandelion, dock, musk thistle, plantain, smartweed, tansy mustard, wild garlic, wild onion.

Brush	2 2/3 - 4 pints per 100 gal water	Spray to thoroughly wet plants when they are in full leaf and growing actively. Where practical cut tall woody plants and spray sucker growth when 2 to 4 feet tall. Retreatment may be needed for some species. Controls Cherokee rose, Japanese honeysuckle, Virginia creeper, wild grape, willow.
Aerial brush spraying	1 1/3 - 2 2/3 pints In 1 gallon diesel oil 2 to 4 gallons water	Aerial spraying is a specialized job. Secure qualified technical guidance and employ a competent reliable applicator. Become familiar with state laws governing the use of herbicides. Treat in spring when brush is fully leaved and growing actively. Controls big sagebrush, buckbrush, rabbitbrush, sandsage, shinnery oak.

Do not graze dairy animals on treated areas within 7 days after treatment. Do not plant treated fallow land until 3 months after treatment, or until chemical has disappeared from soil. Do not apply when grass is in the early boot to milk stage where grass seed production is desired. Do not apply to newly seeded areas or on alfalfa, clover, bent, or susceptible grass pastures as injury may result.

TO PREPARE A SPRAY: Add one-half the required amount of water to the spray tank, then add this product with agitation and finally the balance of water with continued agitation. This product forms an emulsion in water, not a solution.

Local conditions may affect the use of herbicides. Consult your State Agricultural Experiment Station, Farm Advisor, or Extension Weed Specialist for advice in selecting treatment from this label to best fit local conditions. Be sure that use of this product conforms to all applicable laws, rules and regulations. Certain states have restrictions pertaining to application distances from susceptible crops. The applicator should become familiar with these laws, rules or regulations and follow them exactly.

PRECAUTIONARY STATEMENTS

CAUTION

Hazard to Humans and Domestic Animals
Harmful if swallowed or absorbed through skin. Do not get in eyes, on skin or on clothing. Avoid breathing vapors or spray mist. Remove and wash contaminated clothing before reuse. Wash thoroughly before eating or smoking.

Statement of Practical Treatment
In case of contact wash skin with soap and water; for eyes flush with water for at least 15 minutes and get medical attention. If swallowed, drink 1 or 2 glasses of water and induce vomiting by finger in back of throat. Never induce vomiting or give anything by mouth to an unconscious person. Get medical attention immediately.

Environmental Hazards
This product is toxic to fish. Do not apply directly to water. Do not contaminate water by cleaning of equipment or disposal of wastes.

Use Precautions
Do not apply when weather conditions favor drift from treated areas.
Do not use the same spray equipment for other purposes unless thoroughly cleaned.
Do not use in or near a greenhouse.
Do not contaminate water used for irrigation or domestic purposes.
Do not apply WEEDONE LV6 Emulsifiable Broadleaf Herbicide directly to, or permit spray mist to drift onto cotton, okra, grapes, tomatoes, fruit trees, vegetables, flowers or other desirable crop or ornamental plants which are susceptible to 2,4-D herbicide. Do not apply near susceptible plants since very small quantities of the 2,4-D will cause severe injury during the growing or dormant periods.
Crops contacted by WEEDONE LV6 Emulsifiable Broadleaf Herbicide sprays or spray drift may be killed or suffer significant stand loss with extensive quality and yield reduction.
Do not apply when a temperature air inversion exists. Such a condition is characterized by little or no air movement and an increase in air temperature with an increase in height. In humid regions a fog or mist may form. An inversion may be detected by producing a smoke column and checking for a layering effect. If questions exist pertaining to the existence of an inversion, consult with local weather services before making an application.
Use coarse sprays to minimize drift. Do not apply with hollow cone type insecticide or other nozzles that produce fine spray droplets.
Drift from aerial or ground application may be reduced by: (1) applying as near to the target as possible in order to obtain coverage; (2) by increasing the volume of spray mix per acre; (3) by decreasing the pounds of pressure at the nozzle tips; (4) by using nozzles which produce a coarse spray pattern; and (5) by not applying when wind is blowing toward susceptible valuable plants.
At high air or ground surface temperatures, vapors from this product may injure susceptible plants.

STORAGE AND DISPOSAL STATEMENTS

Storage
Do not contaminate or store near food, feedstuff, fertilizers, seeds, insecticides, fungicides or other pesticides.

Disposal
Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other approved state and local procedures.
Pesticide, spray mixture, or rinse water that cannot be used according to label instructions must be disposed of according to applicable Federal, state or local procedures.

LIMITED WARRANTY AND DISCLAIMER

The manufacturer warrants that this product conforms to the chemical description on the label; that this product is reasonably fit for the purposes set forth in the directions for use when it is used in accordance with such directions; and that the directions, warnings and other statements on this label are based upon responsible experts' evaluation of reasonable tests of effectiveness of toxicity to laboratory animals and to plants, and of residues on food crops, and upon reports of field experience. Tests have not been made on all varieties or in all states or under all conditions.

THE MANUFACTURER NEITHER MAKES NOR INTENDS, NOR DOES IT AUTHORIZE ANY AGENT OR REPRESENTATIVE TO MAKE ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IT EXPRESSLY EXCLUDES AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This warranty does not extend to, and the Buyer shall be solely responsible for, any and all loss or damage which results from the use of this product in any manner which is inconsistent with the label directions, warnings or cautions.

BUYER'S EXCLUSIVE REMEDY AND MANUFACTURER'S OR SELLER'S LIABILITY FOR ANY AND ALL CLAIMS, LOSSES, DAMAGES, OR INJURIES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER OR NOT BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE, SHALL BE LIMITED, AT THE MANUFACTURER'S OPTION, TO REPLACEMENT OF OR THE REPAYMENT OF THE PURCHASE PRICE FOR, THE QUANTITY OF PRODUCT WITH RESPECT TO WHICH DAMAGES ARE CLAIMED, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

THIS SPECIMEN LABEL IS INTENDED FOR USE ONLY AS A GUIDE IN PROVIDING GENERAL INFORMATION REGARDING THE DIRECTIONS, WARNINGS AND CAUTIONS ASSOCIATED WITH THE USE OF THIS PRODUCT. AS WITH ANY AGRICULTURAL CHEMICAL, ALWAYS FOLLOW THE LABEL INSTRUCTIONS ON THE PACKAGE BEFORE USING.

UNION CARBIDE

UNION CARBIDE AGRICULTURAL PRODUCTS COMPANY, INC.
P.O. BOX 12014, T.W. ALEXANDER DRIVE
RESEARCH TRIANGLE PARK, N.C. 27709

Form No. AG80031
Printed in U.S.A.

WEEDAR 64® A

Broadleaf Herbicide

UNION CARBIDE

2,4-D amine for weed control. Contains 4 pounds 2,4-D acid equivalent per gallon.

CAUTION: Keep out of reach of children. See other cautions.

ACTIVE INGREDIENT:
Diethanolamine salt of 2,4-Dichlorophenoxyacetic acid 57.5%

INERT INGREDIENTS: 42.5%

2,4-Dichlorophenoxyacetic acid equivalent 39.0% by weight or 4 pounds per gallon.

DIRECTIONS

Where a range of rates is recommended, use the lower rate if annual and biennial weeds are the major problem, the higher rate if perennial weeds are the problem. Apply WEEDAR 64-A in 5 to 40 gallons of water per acre with the higher volume used to provide good coverage when weeds are dense.

FOR EMERGENCY WEED CONTROL IN WHEAT—Perennial broadleaf weeds: Apply 3 pints per acre when weeds are approaching bud stage, but do not spray grain in the seedling or boot to dough stage. The 3 pint (1.5 pound acid equivalent) per acre application of any 2,4-D product can produce injury to wheat. Balance the severity of your weed problem against the possibility of crop damage. Where perennial weeds are scattered, spot treatment is suggested to minimize the extent of crop injury.

WHEAT, BARLEY, RYE, OATS

	PINTS WEEDAR 64® A PER ACRE	GALLONS WATER PER ACRE	DIRECTIONS
Winter Grain			
Annual and biennial weeds	½-2*	8 or more	Apply after grain is fully tillered (about 4"-8" high) but not forming joints in the stem.
Perennial broadleaf weeds	1-2*	8 or more	Apply when weeds are near bud stage. Do not spray grain in boot to dough stage.
Spring Grain			
Annual broadleaf weeds	½-2*	8 or more	Apply after grain is fully tillered (about 4"-8" high) but not forming joints in the stem.
Perennial broadleaf weeds	1-2*	8 or more	Apply when weeds are near bud stage. Do not spray grain in boot to dough stage.
Grain Underseeded with Legumes	¼-½	5-8	Apply after grains are about 8" tall. **Do not spray grain in boot to dough stage.** Do not spray alfalfa or sweet clover unless the infestation is severe and injury to these legumes can be tolerated.

For aerial application on grain apply WEEDAR 64 A in 3 to 10 gallons of water per acre.

*Use the lower rate if small annual and biennial weeds are the major problem. Use the higher rate if perennial weeds or annual and biennial weeds are present which are in the hard-to-kill categories as determined by local experience. The higher rates increase the risk of grain injury and should be used only where the weed control problem justifies the grain damage risk. Do not apply WEEDAR 64 A to grain in the seedling stage. Do not forage or graze treated grain fields within two weeks after treatment with this product. Do not feed treated straw to livestock.

CORN (Field and sweet)—Preemergence: To control annual grasses and broadleaf weeds, apply 2 to 3 pints per acre just before corn emerges. Do not use on light sandy soil or when soil moisture is low.
Postemergence: For annual broadleaf weeds, apply ½ to 1 pint per acre as soon as most weeds have germinated. Spray after corn emerges and until corn is 5" to 8" tall. For perennial broadleaf weeds, use 1 to 1½ pints per acre when weeds are in the bud to bloom stage. Use drop pipes after corn is 12" tall. Do not spray corn in tassel. 2,4-D may cause brittleness to corn. Winds or cultivations may cause stalk breakage while brittle. Certain single cross corn hybrids may be more susceptible to 2,4-D injury than others.

SORGHUM—Apply 1 pint per acre when sorghum is 4"to 12" tall, according to state recommendations. Use drop pipes to keep off sorghum plants.

RICE—To control curly indigo and other broadleaf weeds in rice, use 1½ to 2½ pints per acre 7 to 10 weeks after planting when rice is fully tillered. Do not spray rice in the boot stage.

CONTROLLING WEEDS ON NON-CROP LAND (drainage ditchbanks, highway rights-of-way)—Annual broadleaf weeds: Apply 2 to 3 pints per acre when weeds are young and growing vigorously. **Perennial broadleaf weeds:** Apply 4 to 8 pints per acre when weeds are growing rapidly—generally near the bud stage. Repeated applications are often necessary for complete control.

For spot spraying general weeds in non-crop areas such as highway rights-of-way and drainage ditchbanks, mix 2 to 3 fluid ounces of WEEDAR 64 A in 3 gallons of water. Wet all weeds and stems thoroughly. For best results, treat when weeds are growing actively.

CONTROLLING WEEDS IN PASTURES, OTHER TURF AREAS (golf courses, parks, cemeteries)—Apply 2 to 4 pints per acre in spring or fall when weeds are growing actively. Use higher rate where perennial broadleaf weeds are the major problem. **Do not apply to newly seeded areas until grass has been cut several times.** Where bentgrass predominates, make 2 applications of 1 pint per acre at 3-week intervals.

Do not use for susceptible southern grasses such as St. Augustine. Bentgrasses and clover may be injured by this treatment.

Do not graze dairy animals on treated areas within 7 days after treatment.

To convert local recommendations into terms of WEEDAR 64 A use the following table:

2,4-D ACID	1 lb.	¾ lb.	½ lb.	⅜ lb.	¼ lb.	1/6 lb.	⅛ lb.
WEEDAR 64 A	2 pt.	1½ pt.	1 pt.	¾ pt.	½ pt.	⅜ pt.	¼ pt.

WEEDS CONTROLLED

Annual and biennial weeds

beggarticks
bull thistle
burdock
cockle
cocklebur
coffeeweed
fleabane (daisy)
frenchweed
galinsoga
goatsbeard
jimsonweed
kochia
knotweed
lambsquarters
lettuce (wild)
mallow
marsh elder
morningglory
mustard
parsnip
peppergrass
pigweed
prickly lettuce
primrose
radish (wild)
ragweed (common)
Russian thistle
smartweed
sowthistle (common)
sunflower
tumble weed
vervains
vetch
wild carrot

Perennial Weeds

artichoke
aster
Austrian field cress
bindweed
blue lettuce
Canada thistle
catnip
chicory
dandelion
docks
dogbane
goldenrod
ground ivy
heal-all
hoary cress
horsetail
ironweed
locoweed
nettles
orange hawkweed
plantains
poverty weed
ragweed
sowthistle
stinging nettles
strawberry (wild)
tan weed
toad flax
vervains
wild garlic
wild onion
wild sweet potato

CAUTION

Harmful if swallowed. Avoid inhalation of spray mist and contact with skin, eyes, or clothing. In case of eye contact, flush with water for at least 15 minutes. In case of skin contact wash with soap and plenty of water. Remove and wash contaminated clothing before reuse.

ENVIRONMENTAL HAZARD

Do not apply where runoff is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes. Do not contaminate irrigation ditches or water used for irrigation or domestic purposes. Do not use in or near a greenhouse.

PROTECTION STATEMENTS

Do not apply WEEDAR 64A directly to, or otherwise permit it to come in contact with cotton, okra, grapes, tomatoes, fruit trees, vegetables, flowers or other desirable crop or ornamental plants which are susceptible to 2,4-D herbicide. Do not permit spray mist to drift onto susceptible plants since very small quantities of the 2,4-D can cause severe injury during the growing or dormant periods.

Use coarse sprays to minimize drift. Do not apply with hollow cone-type insecticide or other nozzles that produce fine spray droplets. Drift from **ground application** may be reduced by: (1) keeping the spray boom as near to the crop as possible in order to obtain complete coverage; (2) by applying 5 gallons or more of spray per acre; (3) by using no more than 20 pounds of pressure at the nozzle tips; and (4) by not spraying when the wind exceeds 5 miles per hour.

Drift from *aerial application* may be reduced by: (1) applying as near to the crop as possible in order to obtain coverage; (2) by applying 3 or more gallons of spray per acre; (3) by using 20 pounds pressure or less at the nozzle tips; (4) by using nozzles which produce a coarse spray pattern; (5) by spraying only when the wind velocity is less than 5 miles per hour; and (6) by spraying when there is no possibility for a temperature inversion at time of spraying.

Applications by aircraft, ground rig and hand sprayers should be carried out only where there is no hazard from spray drift. Do not apply near cotton, grapes, tomatoes or near desirable 2,4-D susceptible crop or ornamental vegetation.

At air temperatures above 95°F. do not apply WEEDAR 64 A as vapors from this product may injure susceptible plants. Do not use the same spray equipment for other purposes.

STORAGE AND DISPOSAL STATEMENTS

Do not store near fertilizers, seeds, insecticides or fungicides. Do not reuse containers. Dispose of empty containers by puncturing and burying in non-cropland, away from water supplies, and follow official federal and local recommendations for container disposal. Do not burn.

Local conditions may affect the use of herbicides. Consult your State Agriculture Experiment Station, Farm Advisors, or Extension Weed Specialists for advice in selecting treatment from this label to best fit local conditions.

Be sure that use of this product conforms to all applicable laws, rules and regulations. Certain states have restrictions pertaining to application distances from susceptible crops. The applicator should become familiar with these laws, rules or regulations and follow them exactly. Apply this product only as specified on this label.

WARRANTY

The manufacturer warrants that composition of this product conforms to the chemical description given in the ingredient statement and the product is suited for the purpose described when used according to directions. Because of the broad range of conditions which may be encountered with the use of this product, it is impossible to eliminate all risks, even though label directions are followed. The manufacturer, therefore, makes no other express or implied warranty, and no agent of the manufacturer is authorized to do so. Buyer agrees, in purchasing this product, to assume the risks and in the event of damages arising from a breach of the warranty to accept a refund of the purchase price of the product as full discharge of the manufacturer's liability.

UNION CARBIDE
AGRICULTURAL PRODUCTS COMPANY, INC.
AMBLER, PA 19002

EPA Reg. No. 264-143-AA
Form No. AG80512-5M-10/79-TCG
Printed in U.S.A.

AMITROL T™ Liquid Herbicide

Controls quackgrass, Canada thistle and other tough annual and perennial weeds.

UNION CARBIDE

CAUTION: Keep out of reach of children. See other cautions.

ACTIVE INGREDIENT:
Amitrol (3-amino-1,2,4-triazole)* 21.6%

INERT INGREDIENTS: 78.4%
***Equivalent to 2 lbs. per gal.**

WOODY PLANTS AND VINES

	Gallons AMITROL T Mixture	Gallons WATER	WHEN TO APPLY
Poison ivy—Poison oak	1	100	Treat from the time foliage is fully developed until plants begin to go dormant. For effective control all leaves, stems and suckers must be thoroughly wet to groundline. *If regrowth of honeysuckle appears retreat in August or the following spring.
Honeysuckle*—Kudzu	2	100	
Salmonberry—Western dewberry (blackberry)—big leaf maple	2	100	
Wild cherry—Ash—Locust—Sumac	1½	100	

AQUATIC WEEDS IN MARSHES*, DRAINAGE DITCHES*

	AMOUNTS PER ACRE		WHEN TO TREAT
	GROUND SPRAYING	AERIAL SPRAYING	
CATTAILS			
North Central, Eastern States	3 gals. AMITROL T in 300 gals. water	3 gals. AMITROL T in 10 gals. water	Apply after catkins are fully formed but before frost. Do not disturb sprayed plants. Spot treat any regrowth.
Southwestern, Western States	4 gals. AMITROL T in 400 gals. water	6 gals. AMITROL T in 15 gals. water	
PHRAGMITES			
North Central States	4 gals. AMITROL T in 100 gals. water	4 gals. AMITROL T in 5-10 gals. water	Apply after plants are 30 inches tall until the early fruiting stage. Use at least the volume of water suggested to assure complete wetting.
Atlantic Coast Region flooded	10 gals. AMITROL T in 300 gals. water	10 gals. AMITROL T in 5 gals. water	
non-flooded	7½ gals. AMITROL T in 300 gals. water	7½ gals. AMITROL T in 5 gals. water	
WATER HYACINTH Southeastern States	½ to ¾ gal. AMITROL T in 200 gals. water	½ to ¾ gal. AMITROL T in 5 gals. water	Apply in April. Wet the weeds thoroughly, including small shoots under the main plant. Use the higher rate where growth is very dense.

*DO NOT APPLY WHERE WATER WILL BE USED FOR IRRIGATING, DRINKING, FISHING OR OTHER DOMESTIC PURPOSES.

CAUTION

Harmful if swallowed. Avoid contact with skin, eyes or clothing.

Do not spray or allow spray drift to contaminate edible crops or water which will be used for irrigation, drinking or domestic purposes as no chemical residue in crops is permitted. Spray drift from this product may injure cotton, tomatoes, lawns, ornamentals and other desirable vegetation. Coarse sprays are less likely to drift.

Do not store near fertilizers, seeds, insecticides or fungicides or use in a greenhouse. Do not reuse container. Destroy when empty. Do not burn. Keep livestock off treated area.

IMPORTANT: Do not allow spray solution to remain in a sprayer any longer than necessary. Rinse all spray equipment with clean water immediately after each use to prevent corrosion of metal parts.

Do not use this product for purposes other than those recommended on this label.

If exposed to temperatures of 10°F. or below, shake container before using.

WARRANTY

The manufacturer warrants that composition of this product conforms to the chemical description given in the ingredient statement and the product is suited for the purpose described when used according to directions. Because of the broad range of conditions which may be encountered with the use of this product, it is impossible to eliminate all risks, even though label directions are followed. The manufacturer, therefore, makes no other express or implied warranty, and no agent of the manufacturer is authorized to do so. Buyer agrees, in purchasing this product, to assume the risks and in the event of damages arising from a breach of the warranty to accept a refund of the purchase price of the product as full discharge of the manufacturer's liability.

WEEDS IN NON-CROP AREAS
SUCH AS RAILROADS, ROADSIDES, DRAINAGE DITCH BANKS, FENCE ROWS AND HARDWOOD NURSERIES

WEEDS	SPOT TREATMENTS[1] Spray Mixture		ACRE TREATMENTS[2] Amounts per Acre		WHEN TO APPLY
	Gallons AMITROL T	Gallons WATER	Gallons AMITROL T	Min. Gals. WATER	
CONTROL annual grasses and broadleaf weeds (foxtail, ryegrass, cheatgrass, barnyard grass, annual bluegrass, wild hemp or marijuana, pigweed, kochia, sunflower, wild barley)	½	50	1	100	Spray when most weeds are 3-4 inches tall.
CONTROL annual grasses, annual and perennial broadleaf weeds (whitetop, Canada thistle, volunteer alfalfa, milkweed). SUPPRESS perennial grasses (ripgut grass, reed canary grass, quackgrass).	1	50	2	100	Spray when most weeds are 6-10 inches tall.
Canada thistle sowthistle	1	50	2	40	Spray when most thistle are up and in the bud to bloom stage. Do not mow treated plants. In the Far West, treat during the bloom stage.
quackgrass (couch, witch)	1	50	2	40	Spray when vigorous young growth is 6-8 inches tall.
Whitetop (hoary cress) leafy spurge (Western states) milkweed	1 1 1	50 50 50	2 2 1	40 40 50	Spray in spring when weeds are in the bud to bloom stage. Do not mow treated plants.
Bermudagrass	2	50	4	50	Treat from mid-summer to early fall when shoots are growing vigorously. Spot treat any green regrowth with a solution of 1 gal. AMITROL T per 50 gals. of water.
nutsedge (nut grass)	1	50	2	50	Spray when shoots are 4-5 inches tall and growing actively.
horsenettle	1	50	2	100	In East and Midwest, spray when horsenettle is in the bud to bloom stage. In the Far West, treat from mid-summer to early frost.
horsetail rush	1½	50	3	100	Spray when 6-8 inches tall and growing actively.
dock	½	50	1	50	Apply anytime when dock is actively growing, preferably before development of bloomstalk.
Wild chrysanthemum in hardwood nurseries.	2	50	4	100	Apply as a directed spray on young weed growth 4-6 inches tall. Keep spray off foliage of hardwood nursery stock.

[1]A second treatment may be necessary to control weeds not thoroughly sprayed or weeds coming from dormant seeds and nuts or old roots. Apply when regrowth is young and growing actively.

[2]INTERMOUNTAIN STATES: Canada thistle—use 4 gals. AMITROL T Liquid Herbicide in 100 gals. water per acre. All other weeds—use the rates of AMTROL T Liquid Herbicide per acre as listed in the preceding chart, applied in a **minimum of 100 gallons of water per acre.**

KNAPSACK SPRAYERS:
Spray weeds thoroughly, wetting all leaves and stems to ground line. Mix ½ cup (4 fluid ounces) of AMITROL T per gallon of water. One gallon of spray solution is usually enough to cover 1 square rod (272 square feet) infested with weeds. In Intermountain states or other dryland areas, mix ¼ cup (2 fluid ounces) AMITROL T per gallon of water and apply 2 gallons of spray solution per square rod.

POWER SPRAYERS:
Apply enough of the spray mixture to wet thoroughly all leaves and stems to ground line.

UNION CARBIDE
AGRICULTURAL PRODUCTS COMPANY, INC.
AMBLER, PA 19002

EPA Reg. No. 264-135-ZA
EPA Est. 264-PA-1

Form No. AG80604-5M-10/79-TCG
Printed in U.S.A.

VELSICOL

Banvel®

HERBICIDE

ACTIVE INGREDIENTS:	
Dimethylamine Salt of dicamba (3, 6-dichloro-o-anisic acid)	48.2%
Dimethylamine Salts of related acids	12.0%
Inert Ingredients	39.8%
Total	100.0%

Contains 40.0% 3, 6-dichloro-o-anisic acid (dicamba) or 4 pounds per gallon

USES FOR PASTURE AND RANGELAND, GENERAL FARMSTEAD WEED AND BRUSH CONTROL, AND NON-CROPLAND AREAS SUCH AS FENCE ROWS, ROADWAYS AND WASTELAND

E.P.A. Reg. No. 876-25-AA

CAUTION: KEEP OUT OF THE REACH OF CHILDREN

BEFORE USING BANVEL HERBICIDE READ AND FOLLOW THE PRECAUTIONS APPEARING ON THE CONTAINER.

• • •

IMPORTANT

The following precautions apply to all uses of BANVEL HERBICIDE. Additional precautions and restrictions are under the heading IMPORTANT for specific uses.

Do not contaminate irrigation ditches or water used for domestic purposes.

BANVEL HERBICIDE may cause injury to desirable trees or plants, particularly beans, cotton, flowers, fruit trees, grapes, ornamentals, peas, potatoes, soybeans, sunflowers, tobacco, tomatoes and other broadleaf plants when contacting their roots, stems, or foliage. Plants are most sensitive to BANVEL HERBICIDE during their development or growing stage. Follow the precautions listed below when using BANVEL HERBICIDE.

- Do not treat areas where the possible downward movement into the soil or surface washing may cause contact of BANVEL HERBICIDE with the roots of desirable plants, such as trees and shrubs.
- Avoid making applications when spray particles may be carried by air currents to areas where sensitive crops and plants are growing. Always make applications when there is some air movement in order to determine the direction and distance of possible spray drift. Leave an adequate buffer zone between area to be treated and sensitive plants. Coarse sprays are less likely to drift out of target area. Drift reducing additives such as NALCO-TROL* (Trademark of NALCO CHEMICAL COMPANY) may be used.
- Do not apply BANVEL HERBICIDE in the vicinity of sensitive crops when the daily temperature is expected to exceed 85° F.
- Do not apply using aerial application equipment when sensitive crops and plants are growing in the vicinity of area to be treated.
- To avoid injury to desirable plants, equipment used for BANVEL HERBICIDE should be thoroughly cleaned (see Procedure for Cleaning Spray Equipment on pages 6-7 of this label) before reuse to handle or apply any other chemicals.

All in crop uses of BANVEL HERBICIDE are intended for a normal growing interval between planting and harvest. If this interval is shortened, such as in cover crops which will be plowed under, do not follow up with the planting of a sensitive crop.

Consult your local or state authorities for possible application restrictions and advice concerning special local use situations.

NOTICE: Read "LIMIT OF WARRANTY AND LIABILITY" on the container before buying or using. If terms are not acceptable, return at once unopened.

PROCEDURE FOR CLEANING SPRAY EQUIPMENT

The equipment used for mixing and applying of BANVEL HERBICIDE should be thoroughly cleaned prior to reuse for mixing and application of other pesticides. BANVEL HERBICIDE left in the equipment can contaminate other pesticide applications and cause injury to sensitive crops.

The steps listed below are suggested for thorough cleaning of spray equipment following applications of BANVEL HERBICIDE or BANVEL plus 2,4-D amine tank mixes.

1) Hose down thoroughly the inside as well as outside surfaces of equipment while filling the spray tank half full of water. Flush by operating sprayer until the system is purged of the rinse water.
2) Fill tank with water while adding 1 quart of household ammonia for every 25 gallons of water. Operate the pump to circulate the ammonia solution through the sprayer system for 15 to 20 minutes and discharge a small amount of the ammonia solution through the boom and nozzles. Let the solution stand for several hours, preferably overnight.
3) Flush the solution out of spray tank through the boom.
4) Remove the nozzles and screens and flush the system with two tankfuls of water.

The steps listed below are suggested for thorough cleaning of spray equipment used to apply BANVEL HERBICIDE as a tank mix with wettable powders (W.P.), emulsifiable concentrates (E.C.), or other types of water dispersible formulations. BANVEL HERBICIDE tank mixes with water dispersible formulations require the use of a water-detergent rinse.

5) Complete step 1.
6) Fill tank with water while adding 2 lbs. of detergent for every 40 gallons of water. Operate the pump to circulate the detergent solution through the sprayer system for 5 to 10 minutes and discharge a small amount of the solution through the boom and nozzles. Let the solution stand for several hours, preferably overnight.
7) Flush the detergent solution out of the spray tank through the boom.
8) Repeat step 1 followed by steps 2, 3, and 4.

REFER TO THE CONTAINER LABEL FOR INSTRUCTIONS CONCERNING DISPOSAL OF WASTE AND CLEANING RINSES.

SPRAYABLE FLUID FERTILIZER COMPATIBILITY TEST

BANVEL HERBICIDE is generally compatible with most liquid fertilizers. However, it is advisable that a compatibility test be made whereby all components of the finished spray are mixed in proportionate quantities (see following table) in a small container before mixing in spray tank.

Amount of Herbicide to Add to One Pint of Sprayable Fluid Fertilizer (Assuming Volume is 25 Gallons/Acre)

HERBICIDE	RATE/ACRE	LEVEL TEASPOONS
Wettable Powders	1 pound	1½
	2 pounds	3
	4 pounds	6
Liquid Formulations	1 pint	½
	1 quart	1
	1 gallon	4

The amount of herbicide to be tested in the above table is based on 25 gallons of finished spray per treated acre. When using lower or higher spray volumes, make appropriate changes in the ingredients of the compatibility test.

If herbicide(s) do not bail-up or form flakes, sludge, gels, oily films or layers, or other precipitates, then the tested spray mix is compatible. Usually incompatibility in any of the above described forms will occur within five minutes after mixing.

If incompatibility occurs, the use of a compatibility agent such as Compex* is recommended. Rerun the above Compatibility Test with a suitable compatibility agent (1 teaspoon is equivalent to 2 pints per 100 gallons of fluid fertilizer).

* Trademark of KALO LABORATORIES

IMPORTANT

BANVEL HERBICIDE uses described in this label section may pertain to small grains such as barley, oats, rye, or wheat grown for pasture use only.

NEWLY SEEDED AREAS including small grains such as barley, oats, rye, or wheat grown for pasture, may be severely injured if rates above those listed for control of ANNUAL weeds of BANVEL HERBICIDE are applied.

ESTABLISHED GRASS CROPS growing under stress can exhibit various injury symptoms which may be more pronounced if herbicides are applied. In some areas, Bentgrass, Carpetgrass, Buffalograss, and St. Augustine grass may be injured. Usually Colonial Bentgrasses are more tolerant than creeping types, and Velvet grasses are most easily injured.

Furthermore, rates of BANVEL HERBICIDE in excess of 2 quarts (2 lbs. a.i.) per treated acre may cause temporary injury to sensitive grass species. Treatments will kill or injure Alfalfa, Clovers, Lespedeza, Wild Winter Peas, Vetch and other legumes. Consult your local or state authorities for advice concerning special local use situations and susceptibility for injury of crop varieties to BANVEL HERBICIDE treatments.

FOR LACTATING DAIRY ANIMALS OBSERVE LISTED TIMING RESTRICTIONS.

REMOVE MEAT ANIMALS FROM TREATED AREAS 30 DAYS PRIOR TO SLAUGHTER.

THERE IS NO WAITING PERIOD BETWEEN TREATMENT AND GRAZING FOR NON-LACTATING ANIMALS.

TIMING RESTRICTIONS FOR LACTATING DAIRY ANIMALS FOLLOWING TREATMENT

BANVEL HERBICIDE* Rate Per Treated Acre	Days Before Grazing	Days Before Hay Harvest
Up to 1 pint (½ lb. a.i.)	7 days	37 days
Up to 1 quart (1 lb. a.i.)	21 days	51 days
Up to 2 quarts (2 lbs. a.i.)	40 days	70 days
Up to 8 quarts (8 lbs. a.i.)	60 days	90 days

*Observe all precautions and restrictions on labels of products used in tank mixtures.

continued on reverse side

VELSICOL CHEMICAL CORPORATION 341 East Ohio Street, Chicago, Illinois 60611

MIXING AND APPLICATION

BANVEL HERBICIDE is a water soluble formulation which requires no special mixing instructions. However, when tank mixing with other herbicides, read and follow the instructions on the label of all products used concerning mixing and application.

BANVEL HERBICIDE can be applied using water, oil-water emulsions, or sprayable fluid fertilizer as a carrier. When using sprayable fluid fertilizers, a compatibility test (See SPRAYABLE FLUID FERTILIZER COMPATIBILITY TEST section of this label) should be made prior to tank mixture.

NOTE: To prepare oil-water emulsion, half fill spray tank with water plus appropriate amount of herbicide. With continuous agitation, slowly add a premix of oil plus a suitable emulsifier, such as ACCUTROL® (Trademark of VELSICOL CHEMICAL CORPORATION), to spray tank. Complete filling of spray tank with water. Maintain vigorous agitation during spray operation to prevent oil and water from forming separate layers.

BANVEL HERBICIDE may be applied broadcast using ground or aerial application equipment. Apply 10 to 50 gallons of diluted spray per treated acre when using ground application equipment or 3 to 10 gallons of diluted spray per treated acre when using aerial application equipment. Use the higher level of the listed spray volumes when treating dense vegetation. DO NOT USE AERIAL APPLICATION EQUIPMENT IF SENSITIVE CROPS ARE GROWING IN THE VICINITY OF THE AREA TO BE TREATED.

BANVEL HERBICIDE may be applied to individual clumps or small areas (SPOT TREATMENT) of undesirable vegetation using handgun or similar types of application equipment. Apply 50 to 200 gallons of diluted spray per treated acre to allow complete wetting of foliage and stems.

Spray additives may be used for wetting, penetration, or drift control. A surfactant such as X-77® (Trademark of KALO LABORATORIES), may be used to enhance activity while NALCO-TROL® (Trademark of NALCO CHEMICAL COMPANY), may be used to aid in reducing spray drift. If spray additives are used, read and follow all use recommendations and precautions on product label.

WEEDS CONTROLLED

BANVEL HERBICIDE, when applied in accordance with this label, will give control or growth suppression of many ANNUAL, BIENNIAL, AND PERENNIAL broadleaf weeds, and many WOODY brush and vine species including:

ANNUALS

aster, slender
broomweed, common
buckwheat
buffalobur
burclover, California
buttercup, roughseed
catchfly, nightflowering
chamomile, corn
chickweed, common
clover, annual
cocklebur, corn
cocklebur, cow
cocklebur, common
croton, woolly
eveningprimrose, cutleaf
fleabane, annual
henbit
knawel (*German moss*)
knotweed
kochia
lambsquarters, common
morningglory, ivyleaf
morningglory, tall
mayweed
mustards (*yellowtops*)
pennycress, field
pepperweed, Virginia
pigweed, redroot
pigweed, tumble
poorjoe
puncturevine
ragweed, common
ragweed, giant
rubberweed, bitter (*bitterweed*)
sesbania, hemp
shepherdspurse
sida, prickly (*teaweed*)
smartweed, green
smartweed, Pennsylvania
sneezeweed, bitter
sowthistle, annual
sowthistle, spiny
Spanish needles
spikeweed, common
spurge, prostrate
sumpweed, rough
sunflower, common
thistle, Russian
velvetleaf
waterhemp
waterprimrose, winged
wormwood, annual

BIENNIALS

burdock, common
carrot, wild (*Queen Anne's Lace*)
cocklebur, white
eveningprimrose, common
geranium, Carolina
knapweed, diffuse
knapweed, spotted
mallow, dwarf
plantain, bracted
ragwort, tansy
starthistle, yellow
sweetclover
teasel
thistle, bull
thistle, musk
thistle, plumeless

PERENNIALS

*alfalfa
aster, spiny
aster, whiteheath
bedstraw, smooth
bindweed, field
blueweed, Texas
bursage, skeletonleaf (*bur-ragweed, povertyweed*)
bursage, woollyleaf (*laksaweed*)
*buttercup, tall
campion, bladder
chicory
chickweed, field
chickweed, mouseear
*clover, hop
cress, hoary (*whitetop*)
*dandelion, common
dock, curly
dogbane, hemp
*dogfennel (*cypressweed*)
eupatorium, late (*thoroughwort*)
fern, bracken
garlic, wild
goldenrod, Canada
goldenrod, Missouri
goldenweed, common
horsenettle, Carolina
ironweed
knapweed, black
knapweed, Russian
lupine, silvery
mare's tail (*horsetweed*)
milkweed, climbing
milkweed, common
milkweed, western whorled
nettle, stinging
nightshade, silverleaf
onion, wild
*plantain, buckhorn
*plantain, broadleaf
pokeweed
ragweed, western
redvine
smartweed, swamp
snakeweed, broom
*sorrel, red (*sheep sorrel*)
sowthistle, perennial
spurge, leafy
sundrop, halfshrub (*eveningprimrose*)
thistle, Canada
toadflax, Dalmatian
vetch
waterhemlock
waterprimrose, creeping
*woodsorrel, common yellow
wormwood, common
wormwood, Louisiana
yankeeweed
yarrow, common

*Noted weeds may be controlled using lower rates of BANVEL HERBICIDE or BANVEL PLUS 2,4-D than other listed PERENNIAL weeds. See APPLICATION RATES AND TIMINGS FOR BANVEL HERBICIDES and BANVEL PLUS 2,4-D TANK MIXTURES sections of this label.

WOODY

ash
aspen
basswood
blackberry
blackgum
cedar, eastern red
cherry
chinquapin
condalia, lotebush (*lote*)
cottonwood
creosotebush
cucumbertree
dewberry
dogwood
elm
grape
hawthorn (*thornapple*)
hickory
honeysuckle
hornbeam
huisache
ivy, poison
kudzu
locust, black
maples
meleleuca
mesquite
oak, poison
oaks
persimmon, eastern
peppertree, Brazil (*Florida holly*)
pine
plum, sand (*wild*)
poplar
rabbitbrush
rose, McCartney
rose, multiflora
sagebrush, fringed
sassafras
serviceberry
snowberry, western (*buckbrush*)
sumac
sycamore
tarbush
trumpetcreeper (*buckvine*)
waxmyrtle
willow
witchhazel
yaupon
yucca

APPLICATION RATES AND TIMINGS

Application rates and timings for BANVEL HERBICIDE are given below. Use the higher level of listed rate ranges when treating dense or tall vegetative growth.

- For control of listed ANNUAL broadleaf weeds, apply ½ to 1 pint (¼-½ lb. a.i.) per treated acre of BANVEL HERBICIDE when weeds are small and actively growing. Apply 1 to 1½ pints (½-¾ lb. a.i.) per treated acre when treating established weed growth.
- For control of listed BIENNIAL broadleaf weeds, apply ½ to 1 pint (¼-½ lb. a.i.) per treated acre of BANVEL HERBICIDE when rosettes (first year growth) are less than 3 inches in diameter. Apply 1 to 2 pints (½-1 lb. a.i.) per treated acre when rosettes are 3 inches or more in diameter. Apply 2 to 3 pints (1-1½ lbs. a.i.) per treated acre when treating weeds that have bolted. For best performance, make application when BIENNIAL weeds are in the rosette stage.

APPLICATION RATES AND TIMINGS (CONT.)

- For suppression or top growth control of listed PERENNIAL broadleaf weeds, apply 1 to 2 pints (½-1 lb. a.i.) BANVEL HERBICIDE per treated acre. For control of noted *PERENNIAL weeds, apply 1 to 2 quarts (1-2 lbs. a.i.) BANVEL HERBICIDE per treated acre. For control of other listed PERENNIAL weeds, apply 2 to 4 quarts (2 lbs. a.i.) BANVEL HERBICIDE per treated acre. When treating dense stands of other listed PERENNIAL weeds apply 4 to 8 quarts (4-8 lbs. a.i.) BANVEL HERBICIDE per treated acre.
- For suppression of WOODY brush and vines, apply 1 to pints (½-1 lb. a.i.) per treated acre of BANVEL HERBICIDE after leaf development. Apply 1 to 2 quarts (1-2 lbs. a.i.) per treated acre for added stem control and 2 to 4 quarts (2-4 lbs. a.i.) per treated acre for control of stems and stem sprouts. Apply 1 to 2 gallons (4-8 lbs. a.i.) per treated acre for control of stems and root sprouts.

Retreatments may be made as needed, however, do not exceed 2 gallons (8 lbs. a.i.) per treated acre of BANVEL HERBICIDE during a growing season.

BANVEL PLUS 2,4-D TANK MIXTURES—Tank mix treatments of BANVEL HERBICIDE plus 2,4-D Amine or Low Volatile Ester formulations may be made to pasture, rangeland, and non-cropland areas for control of undesirable vegetation listed in this label as well as additional weeds listed on 2,4-D product label.

READ AND FOLLOW 2,4-D PRODUCT LABELING FOR PRECAUTIONARY STATEMENTS AND RESTRICTIONS.

- For control of ANNUAL broadleaf weeds, tank mix ⅛ to ½ pint (⅛-¼ lb. a.i.) of BANVEL HERBICIDE with ¼ to ½ lb. acid equivalent of 2,4-D per treated acre. Use the higher rates if weeds are beyond the seeding stage at time of treatment.
- For control of BIENNIAL broadleaf weeds, as well as noted* PERENNIAL weeds, tank mix ½ to 1 pint (¼-½ lb. a.i.) of BANVEL HERBICIDE with ½ to 1 lb. acid equivalent of 2,4-D per treated acre. This treatment will give growth suppression of other PERENNIAL broadleaf weeds and WOODY brush and vines.
- For control of PERENNIAL broadleaf weeds, tank mix ½ to 1 quart (½-1 lb. a.i.) of BANVEL HERBICIDE with 1 to 2 lbs. acid equivalent of 2,4-D per treated acre.
- For control of WOODY brush and vines, tank mix BANVEL HERBICIDE with 2 to 4 lbs. acid equivalent of 2,4-D per treated acre. Refer to APPLICATION RATE AND TIMINGS FOR BANVEL HERBICIDES section of this label under WOODY species for BANVEL HERBICIDE use rates.

BANVEL PLUS 2,4,5-T TANK MIXTURES—Tank mix treatments of BANVEL HERBICIDE plus 2,4,5-T Amine or Low Volatile Ester formulation may be made to RANGELAND AND NON-CROPLAND AREAS for control of undesirable WOODY brush and vines.

READ AND FOLLOW 2,4,5-T PRODUCT LABELING FOR PRECAUTIONARY STATEMENTS AND RESTRICTIONS.

- For growth suppression of WOODY brush and vines, tank mix ½ to 1 pint (¼-½ lb. a.i.) of BANVEL HERBICIDE with ⅛ to ½ lb. acid equivalent of 2,4,5-T per treated acre.
- For control of WOODY brush and vines, tank mix 1 to quarts (1-2 lbs. a.i.) of BANVEL HERBICIDE with 1 to 2 lbs. acid equivalent of 2,4,5-T per acre.

CUT SURFACE TREE TREATMENTS

BANVEL HERBICIDE may be applied as a cut surface treatment for control of unwanted trees and prevention of sprouts of cut trees. A mix of 1 part BANVEL HERBICIDE to 5 parts water should be used in applications.

- TREE INJECTIONS: Injector cuts must penetrate the bark and the sapwood, and should be made completely around tree trunk with intervals of 2 to 3 inches between cut edges. An amount of 1 milliliter of BANVEL HERBICIDE/water mix should be applied to each cut.
- FRILL or GIRDLE TREATMENTS: Make a continuous cut or a series of overlapping cuts using an axe to girdle tree trunk. Spray or paint cut surface with the BANVEL HERBICIDE/water mix.
- STUMP TREATMENTS: Spray or paint freshly cut surface with the BANVEL HERBICIDE/water mix. The area adjacent to the bark should be thoroughly wet.

RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

DOW

TORDON* 22K

WEED KILLER

FOR DISTRIBUTION AND USE ONLY WITHIN

IDAHO, NEVADA, OREGON, UTAH, AND WASHINGTON

For control of Yellow Starthistle, Scotch, Musk, and Canada Thistles, Spotted, Diffuse and Russian Knapweeds, Rush Skeletonweed, Larkspur, Leafy Spurge, Rabbitbrush spp., Tansy Ragwort, Field Bindweed, Poison Oak, Gorse, Dalmation Toadflax, Buffalo Bur, Henbane and other Susceptible Poisonous Plants, Broadleaf Weeds and Woody Plants on Rangeland and Permanent Grass Pastures.

ACTIVE INGREDIENT:	
Picloram (4-amino-3,5,6-trichloropicolinic acid) as the potassium salt	**24.4%**
INERT INGREDIENTS	**75.6%**

Acid Equivalent:
Picloram (4-amino-3,5,6-trichloropicolinic acid), 21.1% — 2 lbs/gallon

EPA Reg. No. 464-323
EPA Est. 464-MI-1
EPA SLN No. ID-780009
EPA SLN No. NV-790007
EPA SLN No. OR-780012
EPA SLN No. UT-780004
EPA SLN No. WA-780018

KEEP OUT OF REACH OF CHILDREN

CAUTION

MAY CAUSE IRRITATION
Avoid Contact with Skin and Eyes
Avoid Breathing Spray Mist
Keep Container Closed • Do Not Cut or Weld Container

In case of an emergency endangering life or property involving this product, call collect
517-636-4400

AGRICULTURAL CHEMICAL
Do Not Ship or Store with Food, Feeds, Drugs or Clothing

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Read complete use directions and precautions on this label and container label before using.

Mix the required amount of TORDON 22K Weed Killer in water and apply as a coarse, low pressure spray using ground equipment or helicopter.

For best results, treat when the weeds are growing actively in the spring before full bloom or in late summer or fall. Treatments during full bloom or seed stage of some weeds may not give good control.

BROADCAST TREATMENT: TORDON 22K Weed Killer can be applied as a broadcast treatment at rates of 1 quart or less per acre; higher rates can be used on patches but the total areas treated should be regulated so no more than 25 gals. of TORDON 22K Weed Killer is used on any 100 acre block in a single season. Suggested rates to control several broadleaf weeds are shown in the table below. Weeds requiring higher rates may be suppressed with rates of 1 quart per acre. Apply as a single broadcast spray during any one growing season. Retreat in subsequent years as needed using similar rates. TORDON 22K Weed Killer may be tank mixed with ESTERON* 99* Concentrate, FORMULA 40*, DMA* 4 or ESTERON* 6E herbicides (2,4-D products) for use on areas having mixed species including those which respond well to 2,4-D, such as big sagebrush. In tank mix combinations, use ¼ to 1 quart of TORDON 22K with 1 to 2 quarts ESTERON 99 Concentrate, FORMULA 40 or DMA 4 or with ⅔ to 1⅓ quarts ESTERON 6E per acre.

Weed Species	Rates of TORDON 22K per Treated Acre
Yellow Starthistle†, Scotch Thistle, Musk Thistle, Ox-eye Daisy	¼ to ½ quart
Diffuse Knapweed, Spotted Knapweed, Henbane, Buffalo Bur, Rabbitbrush spp., Tansy Ragwort	½ to 1 quart
Canada Thistle, Rush Skeletonweed, Russian Knapweed, Dalmation Toadflax, Gorse	2-3 quarts††
Leafy Spurge†, Larkspur†, Field Bindweed, Poison Oak†	4 quarts††

†Denotes poisonous plants
††Lower rates may be used for short-term suppression

GROUND APPLICATION: When applying TORDON 22K Weed Killer with ground equipment, use coarse, low pressure spray (under 30 psi) and apply uniformly to provide good coverage of the weeds. Apply only when weather conditions are favorable for keeping spray on the target area. Do not allow spray drift to contact off-target susceptible plants, or areas to be planted to susceptible crops. Do not apply when wind velocity exceeds 10 mph. Where desirable susceptible plants, such as potatoes, beans, peas and other vegetable crops, ornamentals or legumes **are growing or may be planted within ½ mile,** apply TORDON 22K only **if air movement is continuously from a definite direction and away from these plants.**

AIR APPLICATION-HELICOPTER ONLY: When applying by helicopter, pilot must comply with all applicable state and local regulations. When applying TORDON 22K Weed Killer by air, use coarse, low pressure spray (under 30 psi) and apply uniformly to provide good coverage of the weeds (5 gallons per acre or more). Apply only when weather conditions are favorable for keeping spray on target area. Do not allow spray drift to contact off-target susceptible plants. Do not apply when wind velocity exceeds 10 mph, or **as required by state regulations.** The distance between outermost nozzles should not exceed ¾ of the rotor length. Do not spray when air temperature exceeds 85°F. Where desirable susceptible plants, such as potatoes, beans, peas and other vegetable crops, ornamentals or legumes **are growing or may be planted within 1 mile,** apply TORDON 22K only **if air movement is continuously from a definite direction and away from these plants.**

SPOT TREATMENT: For spot treatment of small patches of broadleaf weeds, use ½ to 4 quarts of TORDON 22K in 100 gallons of water and spray weed foliage uniformly using 50 to 100 gallons of spray per treated acre.

NOTE: For treating small areas, 1 quart TORDON 22K Weed Killer in 100 gallons of water per acre is equivalent to 2 teaspoonsful per gallon of water applied to a 500 square foot area.

GRAZING RESTRICTIONS: (Where rates greater than 1 quart per acre are applied). Do not graze dairy animals on treated areas within 2 weeks after application. Other animals should be withdrawn from treated areas at least 3 days before slaughter. Observe grazing restrictions on other product labels when using tank mixtures.

USE PRECAUTIONS

Use this product only as specified on this label. Observe any special use and application restrictions and limitations, including method of application and permissible areas of use as promulgated by state or local authorities.

Do Not Contaminate Nontarget Land Areas, Cropland, Water, or Irrigation Ditches. Do not apply directly to standing or running water. Do not apply where surface water from treated areas can run off to adjacent cropland, either planted or to be planted, or into streams, irrigation ditches, irrigation ponds, or wells. Do not clean containers nor application equipment on or near these areas. Do not apply on inner banks or bottom of irrigation ditches. Do not apply to frozen ground.

Do not apply on or in the vicinity of susceptible crops or desirable plants including alfalfa, beans, clovers, grapes, melons, peas, potatoes, safflower, soybeans, sugar beets, sunflower, tomatoes and other vegetable crops, flowers, fruit plants, ornamentals or shade trees.

Avoid Spray Drift: Applications should be made only when there is no hazard from spray drift since very small quantities of the spray, which may not be visible, may severely injure susceptible crops during both growing and dormant periods. Use coarse sprays to minimize drift since, under adverse weather conditions, fine spray droplets may drift a mile or more. The spray thickening agent, NALCO-TROL[1] may be used with this product to aid in reducing spray drift. If used follow all use recommendations and precautions on the product label.

[1]NALCO-TROL — Trademark of NALCO Chemical Company.

Ground Equipment: With ground equiprnent, spray drift can be lessened by keeping the spray boom as low as possible; by applying 20 gallons or more of spray per acre; by using no more than 30 pounds spraying pressure with large droplet-producing nozzle tips; by spraying when wind velocity is low; and by stopping all spraying when wind exceeds 10 miles per hour. Do not apply with hollow cone-type insecticide or other nozzles that product a fine-droplet spray.

Aerial Application: With helicopter, drift can be lessened by applying a coarse spray; by using no more than 30 pounds spray pressure at nozzles, by using straight stream nozzles directed 45° downward; by using a spray boom no longer than ¾ of the rotor length; and by spraying only when wind velocity is 10 mph or less, **or as required by state regulations.**

Do Not Apply By Helicopter When An Air Temperature Inversion Exists: Such a condition is characterized by little or no wind and with air temperature lower near the ground than at higher levels. The use of a continuous smoke column at or near site of application or use of smoke generating device on the aircraft is suggested to indicate direction and velocity of air movement, and to indicate a temperature inversion by layering of the smoke.

Do not rotate treated rangeland or pasture to other crop uses.

Do not spray pastures if the forage legume component is desired. TORDON 22K Weed Killer may injure or kill legumes. Also, new legume seedings may not be successful if made within 2 years following application of this herbicide.

Do not move treated soil to other areas. Do not use it to grow plants, unless adequate sensitive bioassay or chemical tests show that no detectable picloram is present in the soil.

Do not transfer livestock from treated grass areas onto broadleaf crop areas without first allowing 7 days of grazing on untreated grass pasture. Otherwise, urine may contain enough picloram to cause injury to sensitive broadleaf plants.

Do not re-use containers for TORDON 22K weed killer for any purpose. Dispose by punching holes in them and burying with waste or by taking to an approved landfill. Where indicated, follow official local container disposal regulations.

Rinse application equipment after use, preferably at least three times with water, and dispose of rinse water in a non-cropland area away from water supplies.

Be sure that use of this product conforms to all applicable regulations.

READ AND FOLLOW MIXING AND USE INSTRUCTIONS AND PRECAUTIONS ON PRODUCT CONTAINER LABEL

U.S. Patent No. 3,285,925

NOTICE: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purposes stated on the label when used in accordance with directions under normal conditions of use, but neither this warranty nor any other warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the use of this product contrary to label instruction, or under abnormal conditions, or under conditions not reasonably foreseeable to seller and buyer assumes the risk of any such use.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN 48640

* Trademark of THE DOW CHEMICAL COMPANY

Form No. 137-1125-80 C1179

RESTRICTED USE PESTICIDE

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

DOW

TORDON* Beads

HERBICIDE

FOR DISTRIBUTION AND USE ONLY WITHIN

IDAHO, NEVADA, OREGON
AND UTAH

For the Control of Susceptible Broadleaf Weeds and Woody Plants on Rangeland, Forests, and Permanent Grass Pastures

ACTIVE INGREDIENTS:	
4-amino-3,5,6-trichloropicolinic acid† as the potassium salt	2.3%
Disodium tetraborate pentahydrate	79.2%
Disodium tetraborate decahydrate	16.5%
INERT INGREDIENTS	2.0%
Boron trioxide equivalent	43.8%
4-amino-3,5,6-trichloropicolinic acid equivalent	2.0%

†Known under the common name Picloram.

E.P.A. Registration No. 464-333
*EPA SLN No. ID-790025
EPA SLN No. NV-790008

E.P.A. Est 1624-CA-1
EPA SLN No. OR-790057
EPA SLN No. UT-790016

KEEP OUT OF REACH OF CHILDREN

CAUTION

DUST CAUSES IRRITATION
MAY BE HARMFUL IF SWALLOWED
Avoid Skin and Eye Contact • Wash After Handling

In case of an emergency endangering life or property involving this product, call collect
517-636-4400

AGRICULTURAL CHEMICAL
Do Not Ship or Store with Food, Feeds, Drugs or Clothing

DIRECTIONS FOR USE

It is violation of Federal law to use this product in a manner inconsistent with its labeling.

TORDON Beads herbicide is designed for application to soil for control of susceptible herbaceous and woody plants by absorption through root pick-up. Rainfall is needed after application to leach the picloram to the roots. Application can be made by hand or broadcast equipment. Generally uniform distribution over the rootzone of the plants in the intended site is desirable; however, certain plants may be treated by concentrating the dose near the stem of the target plants. Best results are usually obtained when rain follows shortly after application and shortly before or during active growth. Do not apply TORDON Beads to frozen or saturated soil.

SUGGESTED USE RATES

	lb/A	oz/100 sq. ft.
Yallow starthistla, Scotch thistle, musk thistle, spotted or diffuse knapweeds, lupines, locoweeds.	25-50	1-2
Rush skeletonweed, Russian knapweed, Canada thistle, larkspurs, rabbitbrushes, burrow-weed, snakeweed, fringed snakewort, milk-weeds, artichoke thistle, tansy ragwort common tansy, pricklypear, and cholla cacti	50-100	2-4
Leafy spurge, Utah, Western and one-seed juniper	100-150	4-6
Wild Peach, rose, manzanita,	150-200	6-8

Utah, Western and one-seed junipers, pinyon, and several susceptible woody plants can be controlled by placing the required rates of TORDON Beads herbicide around the stem of the plants; use 2 oz. TORDON Beads herbicide for each 3-4 feet of tree height on juniper or pinyon trees not over 12 feet tall.

TORDON Beads herbicide at rates over about 75 lb per acre may suppress certain grasses, such as wheatgrass. Usually later grass growth will be improved by release from competition. Grass seedlings may be suppressed or killed up to 2 years after application at higher rates. Broadleaf forage plants, especially legumes, in treated areas may be injured or killed and may not grow for 1 to 2 years.

RESTRICTIONS FOR PASTURE AND RANGELAND USE

For use rates above 150 lbs per acre, do not graze treated areas or feed treated forage for 16 weeks after application.

Limit coverage to no greater than 25% of an applicators acreage, found in any particular watershed.

Do not use where a sandy porous surface and substrate overlie ground water closer than 10 feet below the surface.

Where watersheds have significant slope and where rapid runoff can occur, **use spot treetment only.** Do not apply within 1/2 mile of where stream or pond water which drains from the treated watershed may be drawn to irrigate susceptible broadleaf crops, especially beans and potatoes. Do not clean containers or application equipment on or near these areas.

Kill or injury may occur to desirable forbs, trees or shrubs, such as blackberry, cherry, locust, poplar, mountain mahogany, bitterbrush and sumac, from root uptake. If such effects cannot be tolerated, do not apply on or near such dasirabla plants.

Do not apply to cropland used for production of desirable crops other than forage spacies. Do not rotata traated rangeland or pasturas to other crops until residuas of picloram have reach a non-phytotoxic leval. Forage lagumes on tha treatad araas may ba injurad and may not grow for two years or more after treatment.

Read and follow all other use precautions on this label.

USE PRECAUTIONS

Apply this product only as specified on this lebel. The active ingredient in TORDON Beads herbicide is water soluble and should not be applied where surface water from treated areas can run off to croplands either planted or to be planted.

Avoid use near desirable plants. This herbicide is water soluble, highly active and can remain in the soil for more than one growing season. Very small amounts can injure broadleaf plants such as potatoes, peas, beans, sugarbeets or alfalfa; therefore, do not apply on or near these or other susceptible plants, ornamentals, shade trees or vegetable crops. Do not plant these crops or plants in soil that may have injurious amounts of this herbicide.

Avoid movement of treated soil. Picloram may remain in treated soil for an extended period. Do not move treated soil to other areas and do not use such soil to grow plants until residues have reached a non-phytotoxic level.

Avoid transfer of livestock from a treated area to a broadleaf crop area without first allowing 7 days of grazing on untreated pasture for the first 12 months after application. Otherwise, urine may contain enough picloram to cause injury to sensitive broadleaf plants. Do not use manure from animals grazing treated areas to fertilize soil or fields used to grow susceptible broadleaf crops.

Avoid water contamination. Do not allow TORDON Beads herbicide to contaminate water used for drinking, irrigation or other domestic purposes. Do not apply on inner banks or bottoms of irrigation ditches. Do not clean containers or application equipment on or near these areas.

Avoid Improper storage and equipment use. Do not store near fertilizers, seeds, insecticides, fungicides or other pesticides. Containers and equipment used for TORDON Beads herbicide should not be used for other agricultural chemicals since small residues of TORDON Beads herbicide can damage desirable plants.

Avoid improper disposel. Rinse equipment and dispose of waste by burying in non-cropland away from watar supplias. Do not reuse containers. Bury them with waste or dispose in a sanitary landfill or follow official container disposal regulations.

Be sure that use of this product conforms to all applicable state and fedaral ragulations.

U.S. Patent No. 3,285,925

NOTICE: Seller warrants that the product conforms to its chemical description and is reasonably fit for the purposes statad on tha label when used in accordance with directions under normal conditions of use, but neither this warranty nor any other warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE, express or implied, extends to the usa of this product contrary to label instructions, or under abnormal conditions, or under conditions not reasonably foreseeable to seller, and buyer assumes tha risk of any such use.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN 48640

RODEO

HERBICIDE BY Monsanto

For broad-spectrum control of emerged weeds.

Complete Directions for Use

EPA Reg. NO. 524-343

AVOID CONTACT WITH FOLIAGE, GREEN STEMS, OR FRUIT OF CROPS, OESIRABLE PLANTS AND TREES, SINCE SEVERE INJURY OR OESTRUCTION MAY RESULT.

*RODEO is a registered trademark of Monsanto Company

1982-2 A-892.38-000.01 / 53

U.S. Pat. No. 3,799,758 covers use.
Other patents are pending.

In case of an emergency involving this product, Call Collect, day or night, (314) 694-4000.

MONSANTO COMPANY
AGRICULTURAL PRODUCTS
ST. LOUIS, MISSOURI, 63167 U.S.A.

Read the entire label.

Use only according to label instructions.

NOT FOR REFORMULATION OR REPACKAGING.

Read "LIMIT OF WARRANTY AND LIABILITY" before buying or using.

If terms are not acceptable, return at once unopened.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

Buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this company, including but not limited to incompatibility with products other than those set forth in the Directions; application to or contact with desirable vegetation, unusual weather (i. weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied with the normal range being determined on the basis of the average range for the prior 40 years computed from the best available information, and ii. weather perils, including but not limited to hurricanes, tornadoes and floods) as well as weather considerations set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

The buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement.

PRECAUTIONARY STATEMENTS

Hazard to Humans and Domestic Animals

Keep out of reach of children.

CAUTION!

MAY CAUSE EYE IRRITATION.

Avoid contact with eyes, skin or clothing.

FIRST AID: IN CASE OF EYE CONTACT, flush with plenty of water for at least 15 minutes. Call a physician.

Physical or Chemical Hazards

Solutions of this product should be mixed, stored and applied only in stainless steel, aluminum, fiberglass, plastic and plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Environmental Hazards

Do not contaminate water by disposal of waste or cleaning of equipment.

In case of:

SPILL or LEAK, soak up and remove to a landfill.

Storage and Disposal

STORE ABOVE 10°F. (−12°C.) TO KEEP FROM CRYSTALIZING. Crystals will settle to the bottom. If allowed to crystalize, place in a warm room 68°F. (20°C.) for several days to redissolve and mix well before using.

Do not contaminate water, foodstuffs, seed or feed by storage or disposal.

This product, spray mixture or rinsate that cannot be used or chemically reprocessed should be disposed of according to applicable federal, state or local procedures.

Triple rinse container. Then dispose of in a sanitary landfill, or by incineration if allowed by state and local authorities. Do not reuse container.

Consult federal, state or local disposal authorities for approved alternative procedures.

ACTIVE INGREDIENT:	
*Isopropylamine salt of glyphosate	53.5%
INERT INGREDIENTS	46.5%
	100.0%

Contains 648 grams per litre or 5.4 pounds of the active ingredient isopropylamine salt of N-(phosphonomethyl) glycine per U.S. gallon. Equivalent to 480 grams per litre or 4 pounds per U.S. gallon of the acid glyphosate.

GENERAL INFORMATION

This herbicide, a water soluble liquid, mixes readily with water and nonionic surfactant to be applied as a foliage spray for the control or destruction of most herbaceous plants. It may be applied through most standard industrial or field type sprayers after dilution and thorough mixing with water and surfactant in accordance with label instructions.

This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow down activity of this product and delay visual effects of control. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above ground growth and deterioration of underground plant parts.

Unless otherwise specified on this label delay application until vegetation has emerged and reached the stages described for control of such vegetation under the "Weeds Controlled" section of this label.

Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the spray and will continue to grow. For this reason best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity.

Always use the higher rate of this product per acre within the recommended range when (1) weed growth is heavy or dense, or (2) weeds are growing in an undisturbed (non-cultivated) area.

Do not treat weeds under poor growing conditions such as drought stress, disease or insect damage, as reduced weed control may result. Reduced results may also occur when treating weeds heavily covered with dust.

Reduced control may result when applications are made to any weed or brush species that have been mowed, grazed, or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfall or irrigation occuring within 6 hours after application may reduce effectiveness. Heavy rainfall or irrigation within 2 hours after application may wash the chemical off the foliage and a repeat treatment may be required.

This herbicide does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

THE USE OF A NONIONIC SURFACTANT APPROVED FOR THE SITE OF THE DESIRED APPLICATION IS REQUIRED FOR USE WITH THIS PRODUCT. Use ¼ to ½ percent surfactant by total spray volume. Carefully observe all cautionary statements and other information appearing on the surfactant label.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this herbicide or other materials that are not expressly recommended in this labeling. Mixing this product with herbicides or other materials not recommended on this label may result in reduced performance.

For best results, spray coverage should be uniform and complete. Do not spray weed foliage to the point of runoff.

ATTENTION

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift, or splash onto desirable vegetation since minute quantities of this herbicide can cause severe damage or destruction to the crop, plants, or other areas on which treatment was not intended. The likelihood of plant or crop injury occuring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. When spraying avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. When not in use, keep container closed to prevent spills and contamination.

Clean sprayer and parts immediately after using this product by thoroughly flushing with water.

MIXING AND APPLICATION INSTRUCTIONS

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES. DO NOT APPLY UNDER WIND OR OTHER CONDITIONS WHICH ALLOW DRIFT TO OCCUR. HAND GUN APPLICATIONS SHOULD BE PROPERLY DIRECTED TO AVOID SPRAYING DESIRABLE PLANTS. NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, such as WATER FROM PONDS AND UNLINED DITCHES.

MIXING

This product mixes readily with water. Mix spray solutions of this product as follows: fill the mixing or spray tank with the required amount of water while adding the proper amount of this product (see "Directions for Use" and "Weeds Controlled" sections of this label). Near the end of the filling process, add the required surfactant and mix well. Remove hose from tank immediately after filling to avoid siphoning back into the carrier source. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, place the filling hose below the surface of the spray solution, terminate by-pass and return lines at the bottom of the tank and if needed use an approved anti-foam or defoaming agent.

Keep by-pass line on or near bottom of tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh. Carefully select proper nozzle to avoid spraying a fine mist. For best results with conventional ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

APPLICATION EQUIPMENT AND TECHNIQUES

■ AERIAL EQUIPMENT ■

DO NOT APPLY THIS PRODUCT BY AIR IN CALIFORNIA.

Use the recommended rates of this herbicide in 3 to 20 gallons of water per acre unless otherwise specified on this label. See "WEEDS CONTROLLED" section of this label for specific rates. Aerial applications of this product may only be made as specifically recommended on this label.

Coarse sprays are less likely to drift, therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

Ensure uniform application – To avoid streaked, uneven or overlapped application, use appropriate marking devices.

Thoroughly wash aircraft, especially landing gear, after each day of spraying to remove residues of this product accumulated during spraying or from spills. PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART LANDING GEAR ARE MOST SUSCEPTIBLE. The maintenance of an organic coating (Paint) which meets aerospace specification MIL-C-38413 may prevent corrosion.

■ BOOM EQUIPMENT ■

For control of weed or brush species listed on this label using conventional boom equipment – Use the recommended rates of this product and surfactant in 3 to 20 gallons of water per acre as a broadcast spray except as indicated on this label. See "Weeds Controlled" section of this label for specific rates. As density of weeds increase, spray gallonage should be increased within the recommended range to insure complete coverage. Carefully select proper nozzle to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

■ HAND-HELD and HIGH-VOLUME EQUIPMENT ■

Use coarse sprays only

For control of weeds listed on this label using knapsack sprayers or high volume spraying equipment utilizing handguns or other suitable nozzle arrangements – Unless otherwise specified, make a ¼ percent solution of this product in water, add surfactant and apply to foliage of vegetation to be controlled. For best results, use a 1½ percent solution on harder-to-control perennials such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

Applications should be made on a spray-to-wet basis. Spray coverage should be uniform and complete. Do not spray to point of runoff.

Prepare the desired volume of spray solution by mixing the amount of this product in water, shown in the following table:

Spray solution

DESIRED VOLUME	AMOUNT OF RODEO®			
	¼%	½%	1¼%	1½%
1 gallon	1 oz.	1½ oz.	1¾ oz.	2 oz.
25 gallons	1½ pt.	1 qt.	1¼ qt.	1½ qt.
100 gallons	3 qt.	1 gal.	1¼ gal.	1½ gal.

2 tablespoons = 1 ounce

For use in knapsack sprayers, it is suggested that the proper amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

WEEDS CONTROLLED

CONTROL OF ANNUAL WEEDS

Apply to actively growing annual grasses and broadleaf weeds. Use 1½ pints of this product plus ¼ to ½% nonionic surfactant per acre if weeds are less than 6 inches tall. If weeds are over 6 inches tall, apply 2½ pints of this product plus ¼ to ½% surfactant per acre. Allow at least 3 days after application before disturbing treated vegetation. After that period the weeds may be mowed, tilled or burned. See "Application Equipment and Techniques" for specific volumes of water.

When applied as directed under the conditions described in this label, this product plus nonionic surfactant WILL CONTROL the following ANNUAL WEEDS:

Barley
Hordeum vulgare

Bluegrass (annual)
Poa annua

Brome (downy)
Bromus tectorum

Cocklebur
Xanthium pensylvanicum

Corn (volunteer)
Zea mays

Crabgrass
Digitaria spp.

Falseflax (smallseed)
Camelina microcarpa

Fiddleneck
Amsinckia spp.

Fleabane
Erigeron spp.

Foxtail
Setaria spp.

Kochia
Kochia scoparia

Lambsquarters (common)
Chenopodium album

Lettuce (prickly)
Lactuca serriola

Mustard (tansy)
Descurainia pinnata

Oats (wild)
Avena fatua

Panicum
Panicum spp.

Pennycress (field)
Thlaspi arvense

Pigweed, Redroot
Amaranthus retroflexus

Pigweed (smooth)
Amaranthus hybridus

Ragweed (common)
Ambrosia artemisiifolia

Ragweed (giant)
Ambrosia trifida

Rye
Secale cereale

Ryegrass (Italian)*
Lolium multiflorum

Sandbur (field)
Cenchrus spp.

Shattercane
Sorghum bicolor

Smartweed (Pennsylvania)
Polygonum pensylvanicum

Spanishneedles*
Bidens bipinnata

Sunflower
Helianthus annuus

Thistle (Russian)
Salsola kali

Velvetleaf
Abutilon theophrasti

*Apply 3 pints of this product per acre.

Annual weeds generally will continue to germinate from seed throughout the growing season. Repeat treatments may be necessary to control later germinating weeds. Repeat treatments must be made prior to crop emergence.

CONTROL OF PERENNIAL WEEDS

Apply this product as follows to control or destroy most actively growing perennial weeds. Unless otherwise specified, allow at least 7 days after application before disturbing vegetation.

Add ¼ to ½ percent nonionic surfactant by total spray volume to the rates of this product given in this list. See the "General Information" and "Directions for Use" sections of this label for additional information.

NOTE: If weeds have been mowed or tilled, do not treat until regrowth has reached the recommended stages.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

When applied as recommended under the conditions described, this product WILL CONTROL the following PERENNIAL WEEDS:

Alfalfa
Medicago sativa

Alligatorweed*
Alternanthera philoxeroids

Artichoke (Jerusalem)
Helianthus tuberosus

Bahiagrass
Paspalum notatum

Bermudagrass
Cynodon dactylon

Bindweed (field)
Convolvulus arvensis

Bluegrass (Kentucky)
Poa spp.

Brackenfern
Pteridium aquilinum

Bromegrass (smooth)
Bromus inermis

Cattail
Typha spp.

Clover (red)
Trifolium pratense

Clover (white)
Trifolium repens

Cutgrass (giant)*
Zizaniopsis miliacea

Daffisgrass
Paspalum dilatatum

Dandelion
Taraxacum officinale

Dock (curly)
Rumex crispus

Dogbane (hemp)
Apocynum cannabinum

Fescues
Festuca spp.

Guineagrass
Panicum maximum

Knapweed
Centaurea repens

Lantana
Lantana camara

Maidencane
Panicum hematomon

Milkweed
Asclepias spp.

Muhly (wirestem)
Muhlenbergia frondosa

Mullein (common)
Verbascum thapsus

Napiergrass
Pennisetum purpureum

Nightshade (silverleaf)
Solanum elaeagnifolium

Nutsedge (purple, yellow)
Cyperus rotundus
Cyperus esculentus

Orchardgrass
Dactylis glomerata

Paragrass
Brachiaria mutica

Phragmites**
Phragmites spp.

Quackgrass
Agropyron repens

Reed canarygrass
Phalaris arundinacea

Ryegrass (perennial)
Lolium perenne

Smartweed (swamp)
Polygonum coccineum

Spatterdock
Nuphar luteum

Texas Blueweed
Helianthus ciliaris

Thistle (Canada)
Cirsium arvense

Horsenettle
Solanum carolinense

Horseradish
Armoracia rusticana

Johnsongrass
Sorghum halepense

Kikuyugrass
Pennisetum clandestinum

Timothy
Phleum pratense

Torpedograss*
Panicum repens

Vaseygrass
Paspalum urvillei

Wheatgrass (western)
Agropyron smithii

*Partial control.

**Partial control in Southeastern states. See description below.

Alligatorweed — Broadcast 6 pints of this product per acre or apply a 1¼ percent solution with hand-held equipment, to provide partial control of alligatorweed. Apply when most of the plants are in bloom. Repeat applications will be required to maintain such control.

Bermudagrass — Apply 7.5 pints of this product per acre. Apply when bermudagrass is actively growing and when seed heads appear. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Brackenfern — Apply 4.5 to 6 pints of this product per acre as a broadcast spray or as a ¾ to 1 percent solution with hand-held equipment. Apply to brackenfern after fronds are at least 18 inches long.

Canada Thistle — Apply 3 to 4.5 pints of this product per acre. Apply to actively growing thistles when most are at or beyond the bud stage of growth. Fall treatments must be applied before frost. Allow 3 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Cattail — Broadcast 4½ to 7½ pints of this product per acre or apply a ¾ percent solution with hand-held equipment, providing thorough coverage. Apply when most of the plants are in bloom. For best results, apply during the summer or fall months.

Cutgrass (giant) — Broadcast 6 pints of this product per acre or apply a 1 percent solution with hand-held equipment to provide partial control of giant cutgrass. Repeat applications will be required to maintain such control, especially of vegetation partially submerged in water. Allow for substantial regrowth to the seven to ten leaf stage prior to retreatment.

Field Bindweed / Silverleaf Nightshade / Texas Blueweed — Apply 6 to 7.5 pints of this product per acre west of the Mississippi River and 4.5 to 6 pints per acre east of the Mississippi River. Apply when weed is actively growing and is at or beyond full bloom. For silverleaf nightshade, best results can be achieved when application is made after berries are formed. Do not treat when weed is under drought stress as good soil moisture is necessary for active growth. New leaf development indicates active growth. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Guineagrass (Panicum maximum) — Apply 4.5 pints of this product per acre or use a ¾ percent solution with hand-held equipment. Apply to actively growing guineagrass when most has reached at least the 7-leaf stage of growth. Ensure thorough coverage when using hand-held equipment. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Hemp Dogbane / Knapweed / Horseradish — Apply 6 pints of this product per acre. Apply when actively growing and most weeds have reached the late bud to flower stage of growth. Following crop harvest or mowing, allow weeds to regrow to a mature stage prior to treatment. For best results, apply in late summer or fall. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Johnsongrass / Bromegrass (smooth) / Reed Canarygrass / Ryegrass (perennial) / Timothy / Wheatgrass (western) — Apply 3 to 4.5 pints of this product per acre. For best results, apply to actively growing plants when most have reached the boot to head stage of growth. When applying prior to the boot stage, less desirable control may be obtained. Allow johnsongrass to reach at least 18 inches average height. In the fall, apply before plants have turned brown. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Lantana — Apply this product as a ¼ to 1 percent solution using hand-held equipment only. Apply to actively growing lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody state of growth.

Maidencane / Paragrass — Broadcast 6 pints of this product per acre or apply a ¾ percent solution with hand-held equipment. Repeat treatments will be required especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the seven to ten leaf stage prior to retreatment.

Milkweed (common) — Apply 4.5 pints of this product per acre. Apply when actively growing and most of the milkweed has reached the late bud to flower stage of growth. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Nutsedge (purple, yellow) — Apply 4.5 pints of this product per acre as a broadcast spray, or apply a ¾ percent solution from hand-held equipment to control existing nutsedge plants and immature nutlets attached to treated plants. Treat when plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control.

Phragmites (Southeastern States; SC, GA, AL, FL, MS, LA, TX) — Broadcast 7½ pints of this product per acre or apply a 1½ percent solution with hand-held equipment to provide partial control of Phragmites. Apply when most of the plants are in full bloom, or during the fall months. Repeat treatments will be required to maintain such control.

Phragmites (all other states) — Broadcast 6 pints of this product per acre or apply a ¾ percent solution with hand-held equipment. Repeat treatments may be required to maintain control, due to the dense growth of these species preventing thorough spray coverage.

Quackgrass / Wirestem Muhly / Kikuyugrass — Apply 3 to 4.5 pints of this product per acre. Spray when most quackgrass or wirestem muhly is at least 8 inches in height (3 or 4 leaf stage of growth), and actively growing. Do not fall plow or spring till prior to spring application. Allow 3 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Spatterdock — Broadcast 6 pints of this product per acre or apply a ¾ percent solution with hand-held equipment. Apply when most plants are in full bloom. For best results, apply during the summer or fall months.

Torpedograss (Panicum repens) — Apply 6 to 7.5 pints of this product per acre to provide partial control of torpedograss. Apply to actively growing torpedograss when most plants are at or beyond the seedhead stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Other perennials listed on this label — Apply 4.5 to 7.5 pints of this product per acre. Apply when actively growing and most have reached early head or early bud stage of growth. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

CONTROL OF WOODY BRUSH AND TREES

When applied as recommended under the conditions described, this product CONTROLS the following woody brush plants and trees:

Alder Alnus spp.	**Oak***** Quercus spp.
Berries* Rubus spp.	**Multiflora rose** Rosa multiflora
Elderberry Sambucus spp.	**Poison Ivy** Rhus radicans
Honeysuckle Lonicera spp.	**Poison Oak** Rhus toxicodendron
Kudzu Pueraria lobata	**Trumpet creeper** Campsis radicans
Maple** Acer spp.	**Willow** Salix spp.

*Includes blackberry, dewberry and raspberry.
**Includes sugar maple and red maple.
***Includes red oak, white oak and Northern pin oak.

NOTE: Add ¼ to ½% nonionic surfactant by volume to the rates of this product given in this list. See the "General Information" and "Directions for Use" sections of this label for additional information.

If brush has been mowed or tilled or trees have been cut, do not treat until regrowth has reached the recommended stages of growth.

Ensure thorough coverage when using hand-held equipment.

Allow 7 or more days after application before tillage, mowing or removal. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Repeat treatments may be necessary to control plants regenerating from underground parts or seed.

Some autumn colors on undesirable deciduous species are acceptable provided no major leaf fall has occurred.

Apply this product as follows to control or destroy these listed plants and trees.

Alder (Alnus spp.) / Elderberry (Sambucus spp.) — Apply 4.5 to 6 pints of this product as a broadcast spray or as a ¾ to 1 percent solution with hand-held equipment.

Apply when actively growing and at or after the full bloom stage of growth. Use the higher rate for larger plants and dense areas of growth. Best results are achieved when applied in late summer or fall prior to killing frost. Visual symptoms of control may not appear prior to frost or senescence with fall treatments.

Berries (Rubus spp.) — Apply 4.5 to 6 pints of this product per acre as a broadcast spray or as a ¾ to 1 percent solution with hand-held equipment. Apply when canes are actively growing and most are at or beyond the full bloom state of growth. Use the higher rate for plants that have reached the woody stage of growth. Best results are achieved when application is made in late summer or fall after berries are formed. Fall treatments must be applied before a killing frost. This product's activity symptoms may not occur before frost with fall treatments.

Honeysuckle (Lonicera spp.) — Apply 4.5 to 6 pints of this product per acre as a broadcast spray or as a ¾ to 1 percent solution with hand-held equipment. Apply when plants are actively growing and are at or beyond the bloom stage of growth. Use the higher rate for plants that have reached the woody stage of growth.

Kudzu (Pueraria lobata) — Apply 6 pints of this product per acre as a broadcast spray or as a 1½ percent solution with hand-held equipment. Apply product when vines are actively growing and most are at or beyond the early to full bloom stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost.

Maples (Acer spp.) / Oaks (Quercus spp.) — Apply as a ¾ to 1 percent solution with hand-held equipment. Apply product over top of actively growing plants. Apply when at least 50 percent of the new leaves are fully developed. Use the higher rate for large mature trees.

Multiflora Rose (Rosa multiflora) — Apply 3 pints of this product per acre as a broadcast spray or as a ¾ percent solution with hand-held equipment. Apply product when canes are actively growing and most are at or beyond the early to full bloom stage of growth. Treatments should be made prior to leaf deterioration by leaf-feeding insects. Fall treatments must be applied before a killing frost. Symptoms may not occur before frost with fall treatments.

Poison Ivy (Rhus radicans) / Poison Oak (Rhus toxicodendron) – Apply 6 to 7.5 pints of this product per acre as a broadcast spray or as a 1½ percent solution with hand-held equipment. Apply when plants are actively growing at or beyond the early to full bloom stage of growth. Best results are achieved when application is made in late summer after fruit is formed. Repeat applications may be required to maintain control. Fall treatments must be applied before a killing frost and before leaves lose green color. This product's activity symptoms may not occur before frost with fall treatments. Use the higher rate for plants that have reached the woody stage of growth.

Trumpet Creeper (Campsis radicans) – Apply 3 to 4.5 pints of this product per acre as a broadcast spray or as a ¾ to 1 percent solution with hand-held equipment. Apply when vines are actively growing at or beyond the early to full bloom stage of growth. Best results are achieved when application is made in late summer or fall after fruit is formed. Fall treatments must be applied before a killing frost. This product's activity symptoms may not occur before frost with fall treatments. Use the higher rate for plants that have reached the woody stage of growth.

Willow (Salix spp.) – Apply this product as a ¾ percent solution with hand-held equipment. Apply when trees are actively growing and when foliage is full and well developed. For best results, apply in late summer or early fall. Fall treatments must be made before any fall color occurs.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

AQUATIC SITES

When applied as directed under conditions described, this product plus nonionic surfactant will control or partially control emerged annual and perennial weeds and woody brush and trees listed in this label. This product does not control plants which are either completely submerged or have a majority of the foliage under water. See the "Weeds Controlled" section of this label for rates and degree of control provided.

This product may be used in and around aquatic sites, including all bodies of fresh and brackish water, which may be flowing, non-flowing, or transient. This includes lakes, rivers, streams, ponds, seeps, irrigation and drainage ditches, canals, reservoirs, and similar sites. There is no restriction on the use of water for irrigation, recreation, or domestic purposes.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water. Apply the product within one day after drawdown to ensure application to actively growing weeds.

When using this product in aquatic sites where water is present, add 1 to 2 quarts of Ortho X-77™ surfactant per 100 gallons of spray solution (¼ to ½% surfactant by total spray volume).

When using this product in sites where water is not present (dry ditches, ditchbanks, dry canals), use 1 to 2 quarts of nonionic surfactant per 100 gallons of spray solution (¼ to ½% surfactant by total spray volume).

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

NOTE: Do not apply this product within 0.5 miles upstream of potable water intakes.

Do not apply this product on rice levees when flood water is present.

Do not apply in tidewater areas.

Floating mats of vegetation may require retreatment. Avoid washoff of sprayed foliage by spray boat or recreational boat backwash or by rainfall within six hours of application. Do not retreat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of the product in water. When making any bankside applications, do not overlap more than 1 foot into open water. The maximum application rate of 7½ pints per acre must not be exceeded in any single application. Do not spray across open moving bodies of water.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

™Ortho X-77 is a trademark of Chevron Chemical Company

EPA Reg. No. 524-343

In case of emergency involving this product, Call Collect day or night, (314) 694-4000

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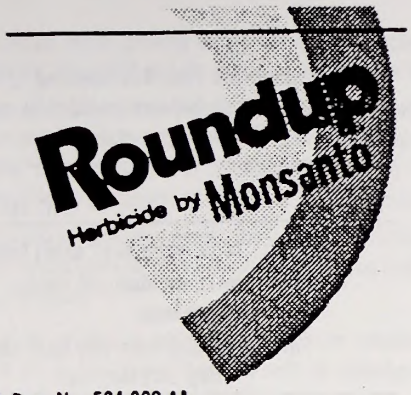
MONSANTO COMPANY
AGRICULTURAL PRODUCTS
ST. LOUIS, MISSOURI 63167 U.S.A.



EPA Reg. No. 524-308-AA

Water soluble herbicide for non-selective control of many annual and perennial weeds;

in NON-CROP AREAS such as:
- Industrial, Recreational and Public areas.
- Farmstead Weed Control.
- Ornamentals
- Turfgrasses and Grasses for Seed Production.

in CROPPING SYSTEMS:

Alfalfa	Oats
Asparagus	Peas
Barley	English or Green
Beans	Sorghum (milo)
Edible (all)	Soybeans
Corn	Sugarcane
Cotton	Wheat

in TREE CROPS:

Almond	Lime
Apple	Macadamia
Avocado	Orange
Cherry	Pear
Non-bearing	Pecan
Filbert	Pistachio
Grapefruit	Tangelo
Kumquat	Tangerine
Lemon	Walnut

in GRAPES - Wine, Table and Raisin

in MINIMUM TILLAGE SYSTEMS for:

Corn	Soybeans

AVOID CONTACT WITH FOLIAGE, GREEN STEMS, OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, SINCE SEVERE INJURY OR DESTRUCTION MAY RESULT.

Read the entire label.
Use only according to label instructions.
Read "LIMIT OF WARRANTY AND LIABILITY" before buying or using. If terms are not acceptable, return at once unopened.

PRECAUTIONARY STATEMENTS

Hazard to Humans and Domestic Animals

Keep out of reach of children.

WARNING!

CAUSES EYE IRRITATION.
HARMFUL IF SWALLOWED.
Do not get in eyes, on skin or on clothing.
FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Flush skin with water. Wash clothing before reuse.

Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied only in stainless steel, aluminum, fiberglass, plastic and plastic-lined steel containers. DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

Environmental Hazards

Keep out of lakes, streams and ponds. Do not contaminate water by disposal of waste or cleaning of equipment.

Storage and Disposal

Avoid contamination of seed, feed, and foodstuffs. Do not reuse container, destroy when empty.

ACTIVE INGREDIENT:	
*Isopropylamine salt of Glyphosate	41.0%
INERT INGREDIENTS:	59.0%
	100.0%

*Contains 480 grams per liter or 4 pounds of the active ingredient isopropylamine salt of N-(phosphonomethyl) glycine per U.S. gallon. Equivalent to 359 grams per liter or 3 pounds per U.S. gallon of the acid, glyphosate.

U.S. Pat. No. 3,799,758 covers use.
Other patents are pending.

In case of an emergency involving this product, Call Collect, day or night, (314) 694-4000.

MONSANTO COMPANY
AGRICULTURAL PRODUCTS
ST. LOUIS, MISSOURI 63166 U.S.A.

LIMIT OF WARRANTY AND LIABILITY

This company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

Buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this company, including but not limited to incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather (i. weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied with the normal range being determined on the basis of the average range for the prior 40 years computed from the best available information, and ii. weather perils, including but not limited to hurricanes, tornadoes and floods) as well as weather considerations set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation. THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

The buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement.

GENERAL INFORMATION

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT.

Roundup® herbicide, a water soluble liquid, mixes readily with water to be applied as a foliage spray for the control or destruction of most herbaceous plants. It may be applied through most standard industrial or field type sprayers after dilution and thorough mixing with water in accordance with label instructions.

This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow down activity of this product and delay visual effects of control. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above ground growth and deterioration of underground plant parts.

Unless otherwise specified on this label delay application until vegetation has emerged and reached the stages described for control of such vegetation under the "Weeds Controlled" section of this label. Unemerged plants arising from unattached underground rhizomes or root stocks of perennials will not be affected by the spray and will continue to grow. For this reason best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity.

Always use the higher rate of this product per acre within the recommended range when (1) weed growth is heavy or dense, or (2) weeds are growing in an undisturbed (non-cultivated) area.

Do not treat weeds under poor growing conditions such as drought stress, disease or insect damage as reduced weed control may result. Reduced results may also occur when treating weeds heavily covered with dust.

Rainfall or irrigation occurring within 6 hours after application may reduce effectiveness. Heavy rainfall

or irrigation within 2 hours after application may wash the chemical off the foliage and a repeat treatment may be required.

Roundup herbicide does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

DO NOT ADD ADDITIONAL SURFACTANT since this formulation contains sufficient wetting agents for the purposes described.

Do not mix with any pesticides, herbicidal oils or any materials other than water, except those listed on this label.

For best results, spray coverage should be uniform and complete. Do not spray weed foliage to the point of runoff.

*Trademark of Monsanto Company

ATTENTION

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift, or splash on to desirable vegetation since minute quantities of this herbicide can cause severe damage or destruction to the crop, plants, or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. When spraying avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. Keep container closed to prevent spills and contamination.

Clean sprayer and parts immediately after using this product by thoroughly flushing with water.

Do not contaminate water by disposal of wastes or cleaning of equipment.

Do not reuse container. Destroy when empty.

MIXING AND APPLICATION INSTRUCTIONS

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES. DO NOT APPLY UNDER WIND OR OTHER CONDITIONS WHICH ALLOW DRIFT TO OCCUR. HAND GUN APPLICATIONS SHOULD BE PROPERLY DIRECTED TO AVOID SPRAYING DESIRABLE PLANTS. NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, such as WATER FROM PONDS AND UNLINED DITCHES.

MIXING

This product mixes readily with water, mix spray solutions of this product as follows. Fill the mixing or spray tank with the required amount of water. Add the proper amount of this product (see "Directions for Use" and "Weeds Controlled" sections of this label) near the end of the filling process and mix well. Remove hose from tank immediately after filling to avoid siphoning back into the carrier source. During mixing and application foaming of the spray solution may occur. To prevent or minimize foam; avoid the use of mechanical agitators, place the filling hose below the surface of the spray solution, terminate by-pass and return lines at the bottom of the tank and if needed use an approved anti-foam or defoaming agent.

TANK MIXTURES

Always predetermine the compatibility of labeled tank mixes of this herbicide with water carrier by mixing small proportional quantities in advance.

Mix labeled tank mixtures of Roundup herbicide with water as follows:

1. Place a 20 to 35 mesh screen or wetting basket over filling port.
2. Through the screen, fill the sprayer tank one-half full with water and start agitation.
3. If a wettable powder is used, make a slurry with the water carrier, and add it SLOWLY through the screen into the tank. Continue agitation.
4. If a flowable formulation is used, pre-mix one part flowable with one part water. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
5. If Lasso is used pour one part Lasso into two parts water and mix. Add diluted mixture SLOWLY through the screen into the tank. Continue agitation.
6. Continue filling the sprayer tank with water and add the required amount of Roundup herbicide near the end of filling process. Maintain good agitation at all times until the contents of the tank are sprayed. NOTE: If spray mixture is allowed to settle at any time, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near bottom of tank to minimize foaming. Screen size in nozzle or line stralners should be no finer than 50 mesh. Carefully select proper nozzle to avoid spraying a fine mist. For best results, use flat fan or flood jet nozzles. Check for even distribution of spray droplets.

SOIL TEXTURE

The recommended use rates of other herbicides labeled for use with Roundup® in tank mixtures generally vary with soil texture. Rate tables throughout this label, unless the soil texture is specifically named, refer to only three soil texture groups: Coarse, Medium and Fine. The following is a complete listing of soil textures included in each of these three soil texture groups:

SOIL TEXTURE GROUP	SOIL TEXTURE
COARSE:	sand, loamy sand, sandy loam
MEDIUM:	loam, silt loam, silt, sandy clay loam
FINE:	silty clay loam, clay loam, sandy clay, silty clay, clay

Refer to the above table to determine the corresponding soil texture group for the soil to be treated.

APPLICATION EQUIPMENT AND TECHNIQUES

BOOM EQUIPMENT

For control of Annual or Perennial Weeds listed on this label using conventional boom equipment—Use the recommended rates of this product in 20 to 60 gallons of water per acre as a broadcast spray. See "Weeds Controlled" section of this label for specific rates. As density of weeds increase, spray gallonage should be increased within the recommended range to insure complete coverage.

HAND-HELD and HIGH VOLUME EQUIPMENT

Use coarse sprays only

For control of weeds listed on this label using knapsack sprayers or high volume spraying equipment utilizing handguns or other suitable nozzle arrangements — Unless otherwise specified, make a 1% solution of this product in water and apply to foliage of vegetation to be controlled. For best results, use a 2% solution on harder-to-control perennials such as bermudagrass, dock, field bindweed, hemp dogbane, milkweed and Canada thistle.

Applications should be made on a spray-to-wet basis. Spray coverage should be uniform and complete. Do not spray to point of runoff.

Prepare the desired volume of spray solution by mixing the amount of this product in water, shown in the following table:

Spray solution

DESIRED VOLUME	AMOUNT OF ROUNDUP® 1%	1½%	2%
1 gallon	1⅓ oz	2 oz	2⅔ oz
25 gallons	1 qt	1½ qt	2 qt
100 gallons	1 gal	1½ gal	2 gal

2 tablespoons = 1 ounce

For use in knapsack sprayers, it is suggested that the proper amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

SELECTIVE EQUIPMENT

This product may be applied through a recirculating spray system, a shielded applicator, or a wiper applicator after dilution and thorough mixing with water,

to listed weeds growing in any non-crop site specified on this label and in cotton or soybeans only.

A recirculating spray system directs the spray solution onto weeds growing above desirable vegetation, while spray solution not intercepted by weeds is collected and returned to the spray tank for reuse.

A shielded applicator directs the herbicide solution onto weeds while shielding desirable vegetation from the herbicide.

A wiper applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution.

AVOID CONTACT WITH DESIRABLE VEGETATION. Contact of the herbicide solution with the desirable vegetation may result in damage or destruction. Applicators used above desired vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam, or splatter of the herbicide solution settling on desirable vegetation may result in discoloration, stunting, or destruction.

Applications made above the crops should be made when the weeds are a minimum of 6 inches above the desirable vegetation. Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations, or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

See the "Weeds Controlled" section of this label for recommended stage of growth for specific weeds.

NOTE

- Maintain equipment in good operating condition. Avoid leakage or dripping onto desirable vegetation.
- Adjust height of applicator to insure proper contact with weeds.
- Keep nozzle tips and wiping surfaces clean.
- Keep spray patterns aligned into recovery chamber of the recirculating sprayer.
- Keep shields on shielded applicators adjusted to protect desirable vegetation.
- Maintain recommended roller RPM on roller applicators while in use.
- Keep wiper material at proper degree of saturation with herbicide solution.
- DO NOT use wiper equipment when weeds are wet.
- DO NOT operate equipment at ground speeds greater than 5 mph. Weed control may be affected by speed of application equipment. As weed density increases, reduce equipment ground speed to insure good coverage of weeds.
- Be aware that on sloping ground the herbicide solution may migrate, causing dripping on the lower end and drying on the upper end of a wiper applicator.
- Variation in equipment design may affect weed control. With wiper applicators, the wiping material and its orientation must allow delivery of sufficient quantities of the recommended herbicide solution directly to the weed.
- Care must be taken with all types of wipers to insure that the absorbent material does not become oversaturated, causing the herbicide to drip on desirable vegetation.
- Mix only the amount of solution to be used during a one day period, as reduced activity may result from use of leftover solutions. With all equipment, drain and clean sprayer and wiper parts immediately after using this product by thoroughly flushing with water.

RECIRCULATING SPRAYERS

Recirculating sprayer calibration is made on the basis of ground speed and delivery volume. Two procedures can be used to calibrate; (1) determine the discharge being delivered per minute, then operate at the designated ground speed, or (2) select the desired ground speed and then adjust the sprayer to deliver the proper volume per minute (this may require nozzle changes). Use the appropriate table below.

Do not operate at nozzle pressure above 20 PSI.

Table 1. Use this table when calibrating Box or Row type recirculating sprayers. Box or Row type sprayer calibration is based on the total discharge collected per row. Use only straight stream or 15° fan type nozzles.

*VOLUME PER MINUTE PER ROW	
MPH	Ounces
2	26 to 35
3	38 to 51
4	51 to 68
5	65 to 86

*NOTE: Be certain the amount collected is for all spray streams treating one row.

Table 2. Use this table when calibrating Broadcast type recirculating sprayers. Broadcast recirculating sprayer calibration is based on the discharge collected per minute from one nozzle on a 20 inch spacing.

VOLUME PER MINUTE PER NOZZLE	
MPH	Ounces
2	7 to 9
3	10 to 13
4	13 to 18
5	16 to 22

When applied as recommended under the conditions described for recirculating sprayers, this product will control the following weeds growing a minimum of 6 inches above desirable vegetation.

Perennial Broadleaf Weeds — To control the following weeds, mix in a ratio of 6 quarts of this product in 20 gallons of water and apply as directed:

Milkweed, Asclepias syriaca

Milkweed control will require repeat applications.

Perennial Grasses and Annual Broadleaf Weeds — To control the following weeds, mix in a ratio of 3 quarts of this product in 20 gallons of water and apply as directed:

Cocklebur	**Pigweed, Redroot**
Xanthium pensylvanicum	Amaranthus retroflexus
Johnsongrass	**Sunflower**
Sorghum halepense	Helianthus annuus

Annual Grasses — To control the following weeds, mix in a ratio of 2 quarts of this product in 20 gallons of water and apply as directed:

Corn (volunteer)	**Shattercane**
Zea mays	Sorghum bicolor

SHIELDED APPLICATORS

When applied as directed under conditions described for shielded applicators, this product will control those weeds listed in the "Weeds Controlled" section of this label.

Shielded applicators which apply the herbicide solution as a spray band should be calibrated on a broadcast equivalent rate and volume basis. To determine these:

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Herbicide Broadcast RATE per acre} = \text{Herbicide Band RATE per acre}$$

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Broadcast VOLUME of solution per acre} = \text{Band VOLUME of solution per acre}$$

Use nozzles that provide uniform coverage within the treated area. EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT WITH DESIRABLE VEGETATION.

For specific rates of application and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

WIPER APPLICATORS

Wiper applicators include either roller or wick devices which physically wipe appropriate concentrations or amounts of this product directly onto the weed. Equipment must be designed, maintained, and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 mph. Performance may be improved by reducing speed in areas of heavy weed infestations to insure adequate wiper saturation. Better results may be obtained if 2 applications are made in opposite directions.

For Roller Applicators — Mix 1 gallon of this product in enough water to prepare 10 gallons of herbicide solution (10% solution). Apply this solution to perennial weeds or annual broadleaf weeds listed in this "Wiper Applicators" section.

Mix 1 gallon of this product in enough water to prepare 20 gallons of herbicide solution (5% solution). Apply this solution to annual grasses listed in this "Wiper Applicators" section.

Roller speed should be maintained at 40 to 60 RPM.

For Wick or other Wiper Applicators — Mix 1 gallon of this product in 2 gallons of water to prepare a 33% solution. Apply this solution to weeds listed in this "Wiper Applicators" section.

In severe infestations, reduce equipment ground

speed to insure that adequate amounts of this product are wiped on the weeds. A second treatment in the opposite direction may be beneficial.

Do not permit herbicide solution to contact desirable vegetation.

When applied as recommended under the conditions described for "Wiper Applicators", this product CONTROLS the following weeds:

ANNUAL GRASSES

Corn (volunteer)
Zea mays

Shattercane
Sorghum bicolor

When applied as recommended under the conditions described for "Wiper Applicators", this product SUPPRESSES the following weeds:

PERENNIAL GRASSES

Johnsongrass
Sorghum halepense

ANNUAL BROADLEAVES

Pigweed, Redroot
Amaranthus retroflexus

Ragweed (giant)
Ambrosia trifida

Sunflower
Helianthus annuus

PERENNIAL BROADLEAVES

Dogbane (hemp)
Apocynum cannabinum

Milkweed
Asclepias syriaca

Nightshade (silverleaf)
Solanum elaeagnifolium

WEEDS CONTROLLED

Roundup herbicide controls many annual and perennial grasses and broadleaf weeds.

CONTROL OF ANNUAL WEEDS

Apply to actively growing grasses and broadleaf weeds. Use 1 quart of this product per acre if weeds are less than 6 inches tall. If weeds are over 6 inches tall, apply 1.5 quarts of this product per acre. Allow at least 3 days after treatment before tillage. See "Directions for Use" for specific volumes of water.

When applied as recommended under the conditions described, this product WILL CONTROL the following ANNUAL WEEDS:

Bluegrass (annual)
Poa annua

Brome (downy)
Bromus tectorum

Corn (volunteer)
Zea mays

Crabgrass
Digitaria spp.

Fleabane
Erigeron spp.

Foxtail
Setaria spp.

Kochia
Kochia scoparia

Lambsquarters (common)
Chenopodium album

Lettuce (prickly)
Lactuca serriola

Panicum
Panicum spp.

Pigweed (redroot)
Amaranthus retroflexus

Pigweed (smooth)
Amaranthus hybridus

Ragweed (common)
Ambrosia artemisiifolia

Ragweed (giant)
Ambrosia trifida

Sandbur (field)
Cenchrus pauciflorus

Shattercane
Sorghum bicolor

Smartweed (Pennsylvania)
Polygonum pensylvanicum

Spanishneedles*
Bidens bipinnata

Sunflower
Helianthus annuus

Thistle (Russian)
Salsola kali

Velvetleaf
Abutilon theophrasti

Wheat (volunteer)
Triticum aestivum

*Apply 2 quarts of this product per acre.

Annual weeds generally will continue to germinate from seed throughout the growing season. Repeat treatments may be necessary to control later germinating weeds. Repeat treatments must be made prior to crop emergence.

CONTROL OF PERENNIAL WEEDS

Apply this product as follows to control or destroy most perennial weeds:

NOTE: If weeds have been mowed or tilled, do not treat until regrowth has reached the recommended stages.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed. Repeat treatments must be made prior to crop emergence.

When applied as recommended under the conditions described, this product WILL CONTROL the following PERENNIAL WEEDS:

Bahiagrass
Paspalum notatum

Bermudagrass
Cynodon dactylon

Bindweed (field)
Convolvulus arvensis

Bluegrass (Kentucky)
Poa spp.

Cattail
Typha spp.

Dallisgrass
Paspalum dilatatum

Dock (curly)
Rumex crispus

Dogbane (hemp)
Apocynum cannabinum

Fescues
Festuca spp.

Guineagrass
Panicum maximum

Johnsongrass
Sorghum halepense

Kikuyugrass
Pennisetum clandestinum

Lantana
Lantana camara

Milkweed
Asclepias spp.

Muhly (wirestem)
Muhlenbergia frondosa

Mullein (common)
Verbascum thapsus

Napiergrass
Pennisetum purpureum

Nightshade (silverleaf)
Solanum elaeagnifolium

Orchardgrass
Dactylis glomerata

Paragrass
Brachiaria mutica

Quackgrass
Agropyron repens

Reed canarygrass
Phalaris arundinacea

Smartweed (swamp)
Polygonum coccineum

Texas Blueweed
Helianthus ciliaris

Thistle (Canada)
Cirsium arvense

Torpedograss
Panicum repens

Vaseygrass
Paspalum urvillei

Bermudagrass — Apply 5 quarts of this product per acre. Apply when bermudagrass is actively growing and when seed heads appear. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Canada Thistle — Apply 2 to 3 quarts of this product per acre. Apply to actively growing thistles when most are at or beyond the bud stage of growth. Fall treatments must be applied before frost. Allow 3 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Field Bindweed/Silverleaf Nightshade/Texas Blueweed — Apply 4 to 5 quarts of this product per acre west of the Mississippi River and 3 to 4 quarts per acre east of the Mississippi River. Apply when weed is actively growing and is at or beyond full bloom. For silverleaf nightshade, best results can be achieved when application is made after berries are formed. Do not treat when weed is under drought stress as good soil moisture is necessary for active growth. New leaf development indicates active growth. For best results, apply in late summer or fall. Fall treatments must be applied before a killing frost. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Guineagrass (Panicum maximum) — Apply 3 quarts of this product per acre or use a 1 percent solution with hand-held equipment. Apply to actively growing guineagrass when most has reached at least the 7-leaf stage of growth. Ensure thorough coverage when using hand-held equipment. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Hemp Dogbane — Apply 4 quarts of this product per acre. Apply when actively growing and most of the dogbane has reached the late bud to flower stage of growth. Following small grain harvest or mowing, allow dogbane to regrow to a mature stage prior to treatment. For best results, apply in late summer or fall. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Johnsongrass/Reed Canarygrass — Apply 2 to 3 quarts of this product per acre. For best results, apply to actively growing plants when most have reached the boot to head stage of growth. When applying prior to the boot stage, less desirable control may be obtained. Allow plants to reach at least 18 inches average height. In the fall, apply before plants have turned brown. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Lantana — Apply this product as a 1 to 1¼ percent solution using hand-held equipment only. Apply to actively growing Lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth. Allow 7 or more days after application before tillage.

Milkweed (common) — Apply 3 quarts of this product per acre. Apply when actively growing and most of the milkweed has reached the late bud to flower stage of growth. Following small grain harvest or mowing, allow milkweed to regrow to a mature stage prior to treatment. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Quackgrass/Wirestem Muhly/Kikuyugrass — Apply 2 to 3 quarts of this product per acre. Spray when most quackgrass or wirestem muhly is at least 8

inches in height (3 or 4 leaf stage of growth), and actively growing. Do not fall plow or spring till prior to spring application. Allow 3 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Torpedograss (Panicum repens) — Apply 4 to 5 quarts of this product per acre to provide partial control of torpedograss. Apply to actively growing torpedograss when most plants are at or beyond the seedhead stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

Other perennials listed on this label — Apply 3 to 5 quarts of this product per acre. Apply when actively growing and most have reached early head or early bud stage of growth. Allow 7 or more days after application before tillage. See "Directions for Use" and "Mixing and Application" sections of this label for labeled uses and specific application instructions.

CONTROL OF WOODY BRUSH AND TREES

When applied as recommended under the conditions described, this product CONTROLS the following woody brush plants and trees.

Berries*	**Oak*****
Rubus spp.	Quercus spp.
Honeysuckle	**Multiflora rose**
Lonicera spp.	Rosa multiflora
Kudzu	**Trumpet creeper**
Pueraria lobata	Campsis radicans
Maple**	**Willow**
Acer spp.	Salix spp.

*Includes blackberry, dewberry and raspberry.
**Includes sugar maple and red maple.
***Includes red oak, white oak and Northern pin oak.

NOTE: If brush has been mowed or tilled or trees have been cut, do not treat until regrowth has reached the recommended stages of growth.

Allow 7 or more days after application before tillage, mowing or removal. See "Directions for Use," and "Mixing Application" sections of this label for labeled uses and specific application instructions.

Repeat treatments may be necessary to control plants regenerating from underground parts or seed.

Apply this product as follows to control or destroy these listed plants and trees.

Berries (Rubus spp.) — Apply 3 to 4 quarts of this product per acre as a broadcast spray or as a 1 to 1½ percent solution with hand-held equipment. Apply when canes are actively growing and most are at or beyond the full bloom stage of growth. Use the higher rate for plants that have reached the woody stage of growth. Best results are achieved when application is made in late summer or fall after berries are formed. Fall treatments must be applied before a killing frost. This product's activity symptoms may not occur before frost with fall treatments. Ensure thorough coverage when using hand-held equipment.

Honeysuckle (Lonicera spp.) — Apply 3 to 4 quarts of this product per acre as a broadcast spray or as a 1 to 1½ percent solution with hand-held equipment. Apply when plants are actively growing and are at or beyond the bloom stage of growth. Use the higher rate for plants that have reached the woody stage of growth. Ensure thorough coverage when using hand-held equipment.

Kudzu (Pueraria lobata) — Apply 4 quarts of this product per acre as a broadcast spray or as a 2 percent solution with hand-held equipment. Apply product when vines are actively growing and most are at or beyond the early to full bloom stage of growth. Repeat applications will be required to maintain control. Fall treatments must be applied before frost. Ensure thorough coverage when using hand-held equipment.

Maples (Acer spp.)/Oaks (Quercus spp.) — Apply as a 1 to 1½ percent solution with hand-held equipment. Apply product over top of actively growing plants. Apply when at least 50 percent of the new leaves are fully developed. Use the higher rate for large mature trees. Ensure thorough coverage when using hand-held equipment.

Multiflora Rose (Rosa multiflora) — Apply 2 quarts of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment. Apply product when canes are actively growing and most are at or beyond the early to full bloom stage of growth. Treatments should be made prior to leaf deterioration by leaf-feeding insects. Fall treatments must be applied before a killing frost. Symptoms may not occur before frost with fall treatments. Ensure thorough coverage when using hand-held equipment.

Trumpet Creeper (Campsis radicans) — Apply 2 to 3 quarts of this product per acre as a broadcast spray or as a 1 to 1½ percent solution with hand-held equipment. Apply when vines are actively growing at or beyond the early to full bloom stage of growth. Best results are achieved when application is made in late summer or fall after fruit is formed. Fall treatments must be applied before a killing frost. This product's activity symptoms may not occur before frost with fall treatments. Use the higher rate for plants that have reached the woody stage of growth.

Willow (Salix spp.) — Apply this product as a 1 percent solution with hand-held equipment. Apply when trees are actively growing and when foliage is full and well developed. Ensure thorough coverage when using hand-held equipment. For best results, apply in late summer or early fall. Fall treatments must be made before any fall color occurs.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in any manner inconsistent with its labeling.

NON-CROP USES

See "General Information" and "Mixing and Application Instructions" sections of this label for essential product performance information.

See the following NON-CROP SECTIONS for specific recommended uses.

EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF SPRAY WITH FOLIAGE OF DESIRABLE TURFGRASSES, TREES, SHRUBS, OR OTHER DESIRABLE VEGETATION SINCE SEVERE DAMAGE OR DESTRUCTION MAY RESULT.

NOTE: If spraying areas adjacent to desirable plants, use a shield made of cardboard, sheet metal or plyboard while spraying to help prevent spray from contacting foliage of desirable plants.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seeds.

Roundup herbicide does not provide residual weed control. For subsequent weed control, follow a label approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

INDUSTRIAL, RECREATIONAL AND PUBLIC AREAS

When applied as directed for "Non-Crop Uses", under conditions described, this product controls annual and perennial weeds listed on this label growing in areas such as airports, ditch banks, dry ditches, dry canals, fencerows, golf courses, highways, industrial plant sites, lumberyards, parking areas, parks, petroleum tank farms and pumping installations, pipelines, power and telephone rights-of-way, railroads, roadsides, schools, storage areas, other public areas and similar industrial or non-crop areas.

For specific rates of application and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

This product may be applied with recirculating sprayers, shielded applicators, or wiper applicators in any non-crop site specified on this label. See the "Selective Equipment" part of "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

FARMSTEAD WEED CONTROL

When applied as directed for "Non-Crop Uses," under conditions described, this product controls undesirable vegetation listed on this label around farmstead building foundations, along and in fences, shelterbelts, and for general non-selective farmstead weed control.

For specific rates of application and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

ORNAMENTALS

NOTE: NOT RECOMMENDED FOR DOMESTIC APPLICATION EXCEPT BY PROFESSIONAL APPLICATORS.

When applied as directed for "Non-Crop Uses", under conditions described, this product controls undesirable vegetation listed on this label prior to planting and in established ornamentals.

For specific rates of application and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

Where repeat applications are necessary, do not exceed 10.6 quarts of this product per acre per year.

Site Preparation — Following preplant applications of this product, any ornamental species may be planted. Precautions should be taken to protect non-target plants during site preparation applications.

Post Directed Spray — Use as a directed spray toward the base of established woody ornamental species listed below.

Arborvitae
Thuja spp.
Azalea
Rhododendron spp.
Boxwood
Buxus spp.
Crabapple
Malus spp.
Euonymus
Euonymus spp.
***Fir**
Abies spp.
Hollies
Ilex spp.
Lilac
Syringa spp.
Magnolia
Magnolia spp.
Maple
Acer spp.
Oak
Quercus spp.
Privet
Ligustrum spp.
***Pine**
Pinus spp.
***Spruce**
Picea spp.
Yew
Taxus spp.

*Includes all established Christmas Tree Plantations.

TURFGRASSES AND GRASSES FOR SEED PRODUCTION

NOTE: NOT RECOMMENDED FOR DOMESTIC APPLICATION EXCEPT BY PROFESSIONAL APPLICATORS.

When applied as directed for "Non-Crop Uses," under conditions described, this product controls most existing vegetation prior to the establishment or renovation of either turfgrasses or grass seed production areas.

For specific rates of application and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

For maximum control of existing vegetation, delay establishment to determine if any regrowth from escaped underground plant parts occurs. Where repeat treatments are necessary, sufficient regrowth must be attained prior to application. For warm-season grasses, such as bermudagrass, summer or fall application provide best control.

DO NOT DISTURB SOIL OR UNDERGROUND PLANT PARTS BEFORE TREATMENT. Tillage or renovation techniques such as vertical mowing, coring or slicing should be delayed for 7 days after application to allow proper translocation into underground plant parts.

TURFGRASSES

Where existing vegetation is growing in a field or unmowed situation, apply this product to actively growing weeds at the stages of growth given in the "Weeds Controlled" section of this label.

Where existing vegetation is growing under mowed turfgrass management, apply this product after omitting at least one regular mowing to allow sufficient growth for good interception of the spray. Desirable turfgrasses may be established following the above procedures.

GRASSES FOR SEED PRODUCTION

Apply this product to actively growing weeds at the stages of growth given in the "Weeds Controlled" section of this label prior to establishment or renovaton of turf or forage grass areas grown for seed producton.

DO NOT feed or graze treated areas within 8 weeks after application.

CROPPING SYSTEMS

See "General Information" and "Mixing and Application Instructions" sections of this label for essential product performance information.

See the following CROPPING SYSTEM SECTIONS for specific recommended uses.

EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF SPRAY WITH FOLIAGE, GREEN STEMS OR FRUIT OF DESIRABLE CROPS, PLANTS, TREES OR OTHER DESIRABLE VEGETATION SINCE SEVERE DAMAGE OR DESTRUCTION MAY RESULT.

Repeat treatments may be necessary to control weeds regenerating from under ground parts or seed. Except as otherwise specified on this label, repeat treatments must be made before the crop emerges in accordance with the instructions of this label.

Except as otherwise specified in a Crop section of this label the combined total of all treatments must not exceed 8 quarts per acre of this product per year.

Do not plant subsequent crops other than those on the label for one year following application.

Do not graze treated cotton fields or feed treated cotton forage to livestock.

For other cropping systems do not feed or forage treated crops within 8 weeks after application.

Roundup herbicide does not provide residual weed control. For subsequent residual weed control follow a label approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

BARLEY
BEANS
Edible (All)
COTTON
CORN (All)
OATS
PEAS
English or Green
SORGHUM (Milo)
SOYBEANS
WHEAT

When applied as directed for "Cropping Systems", under the conditions described, this product controls annual and perennial weeds listed on this label, prior to the emergence of these crops.

For dilution and rates of application using Boom or Hand-Held Equipment, see "Mixing and Application" and "Weeds Controlled" sections of this label.

Spot Treatment (Except edible Beans and Peas) — Applications in growing crops must be made prior to heading of small grains and milo, initial pod set in soybeans, silking of corn and boll opening on cotton.

For dilution and rates of application using Boom or Hand-Held Equipment, see "Mixing and Application" and "Weeds Controlled" sections of this label.

NOTE: DO NOT TREAT MORE THAN 10% OF THE TOTAL FIELD AREA TO BE HARVESTED.

THE CROP RECEIVING SPRAY IN TREATED AREA WILL BE KILLED. TAKE CARE TO AVOID DRIFT OR SPRAY OUTSIDE TARGET AREA FOR THE SAME REASON.

Selective Equipment — This product may be applied through recirculating sprayers, shielded applicators, or wiper applicators in cotton and soybeans.

See the "Selective Equipment" part of the "APPLICATION EQUIPMENT AND TECHNIQUES" section of this label for information on proper use and calibration of this equipment.

Do not harvest cotton or soybeans within 7 days after application.

ALFALFA

When applied as directed for "Cropping Systems", under conditions described, this product controls emerged vegetation prior to the establishment of alfalfa in conventional systems, or when overseeded into a cover crop. When overseeding alfalfa, this product must be applied prior to planting a labeled cover crop.

For dilution and rates of application using Boom or Hand-Held Equipment, see "Mixing and Application" and "Weeds Controlled" sections of this label.

ASPARAGUS

When applied as directed for "Cropping Systems" under the conditions described, this product controls weeds listed on this label in asparagus.

For specific rates of applications and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

Prior to Crop Emergence — Apply this product

prior to crop emergence for the control of emerged labeled annual and perennial weeds. DO NOT APPLY WITHIN A WEEK BEFORE THE FIRST SPEARS EMERGE.

Post Harvest — Apply this product after the last harvest and all spears have been removed. If spears are allowed to regrow, delay application until ferns have developed. Delayed treatments should be applied as a directed or shielded spray in order to avoid contact of the spray with ferns, stems or spears. Direct contact of the spray with the asparagus may result in serious crop injury.

NOTE: Select and use proper spray equipment for post-emergence post harvest applications. A directed spray is any application where the spray pattern is aligned in such a way as to avoid direct contact of the spray with the crop. A shielded spray is any application where a physical barrier is positioned and maintained between the spray and the crop to prevent contact of spray with the crop.

SUGARCANE

When applied as directed for "Cropping Systems," under the condition described, this product controls those emerged annual and perennial weeds listed on this label growing in or around sugarcane or in fields to be planted to sugarcane. This product will also control undesirable sugarcane.

NOTE: Where repeat treatments are necessary, do not exceed a total of 10.6 quarts of this product per acre per year. Do not apply to vegetation in or around ditches, canals or ponds containing water to be used for irrigation.

Broadcast Treatment — Apply this product in 20 to 60 gallons of water per acre on emerged weeds growing in fields to be planted to sugarcane.

For specific rates of application and instructions for control of various annual and perennial weeds see the "Weeds Controlled" section of this label.

For removal of last stubble or ratoon cane, apply 4 to 5 quarts of this product in 20 to 60 gallons of water per acre to new growth having at least 7 or more new leaves. Allow 7 or more days after application before tillage.

Spot Treatment in or Around Sugarcane Fields — For dilution and rates of application using Hand-Held Equipment, see "Mixing and Application" and "Weeds Controlled" sections of this label.

For control of volunteer or diseased sugarcane, make a 1% solution of this product in water and spray to wet the foliage of vegetation to be controlled.

NOTE: When spraying volunteer or diseased sugarcane, the plants should have at least 7 new leaves.

Avoid spray contact with healthy cane plants since severe damage or destruction may result.

■ TANK MIXTURES ■
Minimum Tillage Systems
CORN

When applied as recommended under the conditions described, these tank mixtures control many emerged weeds, and give preemergence control of many annual weeds when corn will be planted directly into a cover crop, established sod, or in previous crop residues.

Refer to specific product labels for crop rotation restrictions and cautionary statements of all products used in these tank mixtures. Lasso® EC herbicide may be substituted for Lasso® herbicide in these tank mixtures. For mixing instructions, see the "Mixing and Application Instructions" section of this label.

Do not use these tank mixtures on sand or loamy sand soils.

■ **ROUNDUP® plus LASSO® plus ATRAZINE** ■
or
■ **ROUNDUP® plus LASSO plus BLADEX™** ■
or
■ **ROUNDUP® plus LASSO® plus PRINCEP™** ■
or
■ **ROUNDUP® plus ATRAZINE plus PRINCEP™** ■

Apply these tank mixtures in 20 to 60 gallons of water per acre immediately before, during or after planting, but BEFORE CROP EMERGENCE. As density of stubble, crop residue or weeds increases, spray gallonage and rate should be increased within the recommended ranges to insure complete coverage.

CONTROL OF EMERGED WEEDS

Annual Weeds — Apply to actively growing grasses and broadleaf weeds. Use 1 quart of Roundup Herbicide per acre in these tank mixtures if weeds are less than 6 inches tall. If weeds are over 6 inches tall, apply 1.5 quarts of this product per acre. For emerged annual weeds controlled, see the "Weeds Controlled" section of this label.

Perennial Weeds — At normal application dates in minimum tillage systems, perennial weeds may not be at the proper stage of growth for control. See the "General Information" section of this label for the proper stage of growth for perennial weeds. Use of 2 to 4 quarts of Roundup herbicide per acre in these tank mixtures, under these conditions provides top kill and reduces competition from many emerged perennial grass and broadleaf weeds. For emerged perennial weeds controlled, see the "Weeds Controlled" section of this label. To obtain control, follow recommendations on this label for stage of growth and rate of application for specific perennial weeds. To obtain the desired stage of growth, it may be necessary to apply Roundup herbicide alone in the late summer or fall and then follow with a label approved seedling weed control program at planting.

NOTE: When using these tank mixtures, do not exceed 4 quarts of Roundup herbicide per acre.

USE OF THESE TANK MIXTURES FOR BERMUDAGRASS OR JOHNSONGRASS CONTROL IN MINIMUM TILLAGE SYSTEMS IS NOT RECOMMENDED. For bermudagrass control, follow the instructions under "Control of Perennial Weeds" section of this label and then use a label approved seedling weed control program in a minimum tillage or conventional tillage system. For johnsongrass control, follow the instructions under the "Control of Perennial Weeds" section of the label, and then use a label approved seedling weed control program with conventional tillage.

PREEMERGENCE WEED CONTROL

■ **LASSO® plus ATRAZINE** ■

For weeds controlled preemergence, see the "Weed Control with Lasso® and Lasso plus atrazine (Tank Mixture)" sections of the label for Lasso herbicide.

See the following table for recommended rates of Lasso plus atrazine 80W in this tank mixture with Roundup herbicide on various soil types.

Lasso® plus atrazine

SOIL TEXTURE GROUP*	BROADCAST RATE PER ACRE Lasso® (Quarts)	atrazine 80W** (Pounds)
COARSE		
Sandy Loam only	2 to 2.5	1.25 to 1.5
MEDIUM	2.5 to 3	1.5 to 2
FINE	2.5 to 3	2 to 2.5

*Refer to the Soil Texture section of the label to determine the corresponding soil texture group for the soil to be treated.

**When using atrazine 4L or AAtrex™ 4LC use equivalent rates. One quart equals 1.25 pound of atrazine 80W.

Use the higher rate of Lasso® herbicide in the recommended ranges in areas of heavy grass infestation or when fall panicum or crabgrass will be present.

Use the higher rate of atrazine in the recommended ranges on soils with greater than 3% organic matter.

■ **LASSO® plus BLADEX™** ■

For weeds controlled preemergence, see the "Weed Control with Lasso and Lasso plus Bladex (Tank Mixture)" sections of the label for Lasso herbicide.

See the following table for recommended rates of Lasso plus Bladex in this tank mixture with Roundup herbicide on various soil types.

Lasso® plus Bladex™

SOIL TEXTURE GROUP*	BROADCAST RATE PER ACRE Lasso® (quarts)	+	Bladex** 4L (quarts)
COARSE	2 to 2.5		1 to 1.6
MEDIUM	2.5 to 3		1.2 to 1.6
FINE	2.5 to 3		1.6 to 2.2

*Refer to the Soil Texture section of the label to determine the corresponding soil texture group for the soil to be treated.

**When using Bladex 80W use equivalent rates. One quart Bladex 4L equals 1.25 lbs. of Bladex 80W.

Use the higher rate of Lasso® herbicide in the recommended ranges in areas of heavy grass infestation or when fall panicum or crabgrass will be present.

Use the higher rate of Bladex in the recommended ranges on soils with greater than 3% organic matter.

NOTE: Do not use this mixture on sand or loamy sand soils with less than 2% organic matter.

™Bladex is a trademark of the Shell Chemical Company.

■ **LASSO® plus PRINCEP™** ■

For weeds controlled preemergence see the "Weed Control" sections of the labels for Lasso and Princep.

See the following table for recommended rates of Lasso plus Princep in this tank mixture with Roundup herbicide on various soil types.

Lasso® plus Princep™ 80W

SOIL TEXTURE GROUP*	BROADCAST RATE PER ACRE Lasso® (Quarts)	Princep 80W** (Pounds)
COARSE		
Sandy Loam only	2 to 2.5	1.25 to 1.5
MEDIUM	2.5 to 3	1.5 to 2
FINE	2.5 to 3	2 to 2.5

*Refer to the Soil Texture section of the label to determine the corresponding soil texture group for the soil to be treated.

**When using Princep 4L use equivalent rates. One quart equals 1.25 pounds of Princep 80W.

Use the higher rate of Lasso® herbicide in the recommended ranges in areas of heavy grass infestation or when fall panicum or crabgrass will be present.

Use the higher rate of Princep herbicide in the recommended ranges on soils with greater than 3% organic matter.

®Lasso is a registered trademark ot Monsanto Company.
™Princep is a registered trademark of Ciba-Geigy Corporation.
™AAtrex is a registered trademark of Ciba-Geigy Corporation.

■ **ATRAZINE plus PRINCEP™** ■

For weeds controlled preemergence see the "Weed Control" sections of the labels for atrazine and Princep.

See the following table for recommended rates of atrazine 80W and Princep 80W in this tank mixture with Roundup herbicide on various soil types.

Atrazine 80W plus Princep™ 80W

SOIL TEXTURE GROUP*	BROADCAST RATE PER ACRE atrazine 80W** (Pounds)	Princep 80W** (Pounds)
COARSE		
Sandy Loam only	1.25	1.25
MEDIUM	1.25 to 1.75	1.25 to 1.75
FINE	1.5 to 2	1.5 to 2

*Refer to the Soil Texture of the label to determine the corresponding soil texture group for the soil to be treated.

**When using atrazine 4L, AAtrex 4LC or Princep 4L use equivalent rates. One quart equals 1.25 pounds of atrazine 80W or Princep 80W.

Use the higher rate of these products in the recommended ranges on soils with greater than 3% organic matter.

™Princep is a registered trademark of Ciba-Geigy Corporation.
™AAtrex is a registered trademark of Ciba-Geigy Corporation.

■ TANK MIXTURES ■
Minimum Tillage Systems
SOYBEANS

When applied as directed under the conditions described, these tank mixtures control many emerged annual weeds, suppress many emerged perennial weeds and give preemergence control of many annual weeds when soybeans will be planted directly into a cover crop, stale seed bed, or in previous crop residues such as wheat stubble. These tank mixtures will not control regrowth from perennial weeds.

Refer to specific product labels for crop rotation restrictions and cautionary statements of all products used in these tank mixtures. Lasso® EC herbicide may be substituted for Lasso® herbicide in these tank mixtures. For mixing instructions, see the "Mixing and Application Instructions" section of this label.

■ **ROUNDUP® plus LASSO® plus LOROX™** ■
or
■ **ROUNDUP® plus LASSO® plus LEXONE™** ■
or
■ **ROUNDUP® plus LASSO® plus SENCOR™** ■

Apply these tank mixtures in 20 to 60 gallons of water per acre immediately before, during or after planting, but BEFORE CROP EMERGENCE. As density of stubble, crop residue or weeds increases, spray gallonage and rate should be increased within the recommended ranges to insure complete coverage.

CONTROL OF EMERGED WEEDS

Annual Weeds — Apply to actively growing grasses and broadleaf weeds. Use 1 quart of Roundup Herbicide per acre in these tank mixtures if weeds are less than 6 inches tall. If weeds are over 6 inches tall, apply 1.5 quarts of this product per acre. For emerged annual weeds controlled, see the "Weeds Controlled" section of this label.

Perennial Weeds — At normal application dates in minimum tillage systems, perennial weeds may not be at the proper stage of growth for control. See the "General Information" section of this label for the proper stage of growth for perennial weeds. Use of 2 to 4 quarts of Roundup herbicide per acre in these tank mixtures under these conditions provides top kill and reduces competition from many emerged perennial grass and broadleaf weeds. For emerged perennial weeds controlled, see the "Weeds Controlled" section of this label. To obtain control, follow recommendations on this label for stage of growth and rate of application for specific perennial weeds. To obtain the desired stage of growth, it may be necessary to apply Roundup herbicide alone in the late summer or fall and then follow with a label approved seedling weed control program at planting.

NOTE: When using these tank mixtures, do not exceed 4 quarts of Roundup herbicide per acre.

USE OF THESE TANK MIXTURES FOR BERMUDAGRASS OR JOHNSONGRASS CONTROL IN MINIMUM TILLAGE SYSTEMS IS NOT RECOMMENDED. For bermudagrass control, follow the instructions under "Control of Perennial Weeds" section of this label and then use a label approved seedling weed control program in a minimum tillage or conventional tillage system. For johnsongrass control, follow the instructions under the "Control of Perennial Weeds" section of the label, and then use a label approved seedling weed control program with conventional tillage.

PREEMERGENCE WEED CONTROL

■ **LASSO® plus LOROX™** ■

For weeds controlled preemergence, see the "Weed Control with Lasso® and Lasso plus Lorox 50WP" sections of the label for Lasso herbicide.

See the following table for recommended rates of Lasso plus Lorox 50WP in this tank mixture with Roundup herbicide on various soil types.

Lasso® plus Lorox

SOIL TEXTURE GROUP*	BROADCAST RATE PER ACRE Lasso® (Quarts)	Lorox 50 WP (Pounds)
COARSE		
Sandy Loam only	2 to 2.5	1 to 1.5
MEDIUM	2.5 to 3	1.5 to 2
FINE	2.5 to 3	2 to 3

*Refer to the Soil Texture Section of the label to determine the corresponding soil texture group for the soil to be treated.

Use the higher rate of Lasso in the recommended ranges in areas of heavy grass infestation or when fall panicum or crabgrass will be present.

Use the higher rate of Lorox 50WP in the recommended ranges on soils with greater than 3% organic matter.

Do not use this mixture on sand or loamy sand or on soil with less than 1% organic matter as crop injury from Lorox may occur.

™Lorox is a registered trademark of E.I. duPont deNemours and Company

®Lasso is a registered trademark of Monsanto Company

■ **LASSO® plus LEXONE™** ■
or
■ **LASSO® plus SENCOR™** ■

For weeds controlled preemergence, see the "Weed Control with Lasso® and Lasso plus Lexone or Sencor" sections of the label for Lasso herbicide.

See the following table for recommended rates of Lasso plus Lexone 50WP or Lasso plus Sencor 50WP in this tank mixture on various soil types.

Lasso® plus Lexone™ 50 WP or Lasso® plus Sencor™ 50WP

SOIL TEXTURE GROUP*	BROADCAST RATE PER ACRE Lasso® (Quarts)	Lexone 50WP** or Sencor 50WP** (Pounds)
COARSE		
Sandy Loam only	2 to 2.5	0.5 to 0.75
MEDIUM	2.5 to 3	0.75 to 1
FINE	2.5 to 3	1 to 1.5***

*Refer to the Soil Texture Section of this label to determine the corresponding soil texture group for the soil to be treated.

**When using Lexone 4L or Sencor 4 Flowable use equivalent rates. One quart equals 2 pounds of Lexone 50 WP or Sencor 50 WP.

***On the silty clay or heavy clay soils of the Mississippi Delta, use 1.5 to 2 pounds of Lexone or Sencor per acre.

Use the higher rate of Lasso herbicide in the recommended ranges in areas of heavy grass infestations or when fall panicum or crabgrass will be present.

Use the higher rate of Lexone or Sencor herbicides in the recommended ranges on soils with greater than 2% organic matter.

Do not use this mixture on sand or loamy sand soils as crop injury from Lexone or Sencor may occur.

Do not use on muck soils.

Do not apply on alkaline soils with a pH of more than 7.4.

Crop injury may occur if any atrazine was applied on the soil the year before use of this Lexone or Sencor tank mixture.

DO NOT REPLANT CROPS OTHER THAN SOYBEANS FOR 120 DAYS AFTER APPLICATION.

®Lasso is a registered trademark of Monsanto Company.

™Lorox is a registered trademark of E. I. duPont de Nemours and Company.

™Lexone is a registered trademark of E. I. duPont de Nemours and Company.

™Sencor is a registered trademark of the parent company of Farbenfabriken Bayer GmbH, Leverkusen.

TREE CROPS

This herbicide is recommended for weed control in established groves, or orchards or for site preparation prior to transplanting.

See "General Information" and "Mixing and Application Instructions" sections of this label for essential product performance information.

Boom Application — Apply this product in 20 to 60 gallons of water per acre, on emerged weeds. When applying to dense vegetation using a low trailing shielded boom, use the higher rate of this herbicide in 50 to 100 gallons of water.

For specific rates of applications and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

Hand-Held Application — Apply a water solution of this product as recommended in the "Mixing and Application Instructions" section of this label. Manual applications with low gallonage single nozzle tips may not provide adequate coverage in tall dense vegetation.

NOTE

Repeat treatments may be necessary to control weeds regenerating from under ground parts or seed. The combined total of all treatments must not exceed 10.6 quarts per acre per year. Do not feed or forage treated areas for 8 weeks after application. EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF SPRAY, DRIFT OR MIST WITH GREEN FOLIAGE, GREEN BARK OR BARK OF TREES ESTABLISHED LESS THAN TWO YEARS, SUCKERS, OR FRUIT OF DESIRABLE TREES, CROPS, PLANTS OR OTHER DESIRABLE VEGETATION. SPRAY CONTACT WITH OTHER THAN MATURED BARK ON THE MAIN TRUNK CAN RESULT IN SERIOUS LOCALIZED OR TRANSLOCATED DAMAGE.

If weeds have been mowed, allow regrowth to reach the recommended stage of growth prior to application of this product. Do not apply to weeds under drought stress.

Roundup herbicide does not provide residual weed control. For subsequent weed control, follow a label approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. See the following TREE CROP SECTIONS for specific recommended uses.

AVOCADO	LIME
GRAPEFRUIT	ORANGE
KUMQUAT	TANGELO
LEMON	TANGERINE

When applied as directed for "Tree Crops", under the conditions described, this product controls annual and perennial weeds listed on this label in these established groves or orchards or when used for site preparation prior to transplanting.

NOTE: Allow a minimum of 14 days between last application and harvest.

APPLES and PEARS

When applied as directed for "Tree Crops", under the conditions described, this product controls annual and perennial weeds listed on this label in these established groves or orchards or when used for site preparation prior to transplanting.

NOTE: Allow a minimum of 14 days between last application and harvest.

ALMOND	PECAN
FILBERT	PISTACHIO
MACADAMIA	WALNUT

When applied as directed for "Tree Crops", under the conditions described, this product controls annual and perennial weeds listed on this label in these established groves or orchards or when used for site preparation prior to transplanting.

NOTE: Allow a minimum of 21 days between last application and harvest.

NON-BEARING CHERRY TREES

When applied as directed for "Tree Crops", under the conditions described, this product controls annual and perennial weeds listed on this label in these established groves or orchards or when used for site preparation prior to transplanting.

DO NOT APPLY TO TREES THAT WILL BE HARVESTED WITHIN ONE YEAR AFTER APPLICATION.

GRAPES
Wine, Table, Raisin

This herbicide is recommended as a directed spray for weed control in established vineyards or for site preparation prior to transplanting new vines.

For recommended rates and application see the "General Information" and "Mixing and Application Instructions" sections of this label for essential product performance information.

Applications should not be made when green shoots or canes or foliage are in the spray zone. (In the Northeast and Great Lakes regions, applications must be made prior to the end of bloom stage of grapes to avoid injury.)

DO NOT ALLOW SPRAY, DRIFT OR MIST TO CONTACT GREEN FOLIAGE, GREEN BARK, SUCKERS OR VINES AND RENEWALS LESS THAN 3 YEARS OF AGE. SPRAY CONTACT, OTHER THAN WITH MATURE BARK OF THE MAIN TRUNK, CAN RESULT IN SERIOUS LOCALIZED OR TRANSLOCATED DAMAGE.

Boom Application — Apply this product in 20 to 60 gallons of water per acre, on emerged weeds.

For specific rates of applications and instructions for control of various annual and perennial weeds, see the "Weeds Controlled" section of this label.

Hand-Held Application — Apply a water solution of this product as recommended in the "Mixing and Application Instructions" section of this label.

NOTE

If repeat treatments are necessary for weed control in vineyards, do not exceed a total of 10.6 quarts of this product per acre per year. Do not treat between 14 days before harvest to fall dormancy when no green vegetation, canes or shoots exist.

Roundup herbicide does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

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