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2008 edition of the PNW Weed
Management Handbook. For ordering
information, please see next page.

2008 PACIFIC NORTHWEST



Weed

MANAGEMENT HANDBOOK

This book is revised annually.

Poison emergency telephone number is on inside front and inside back covers.

Extension Services of Oregon State University,
Washington State University, and University of Idaho.



2008
PACIFIC NORTHWEST

Weed

MANAGEMENT HANDBOOK

Puncturevine (Tribulus terrestris) seedpod with five burs. Actual diameter is 0.5 inch. Photo: Alysia Greco, Horticulture Department, Oregon State University.

Editor

Ed Peachey
Oregon State University

Associate Editors

Dan Ball, Oregon State University
Robert Parker and Joseph Yenish, Washington State University
Don Morishita and Pam Hutchinson, University of Idaho

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Publication Orders
Extension & Station Communications
Oregon State University
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Washington State University
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Web <http://info.ag.uidaho.edu/>

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AUTHORS AND CONTRIBUTORS

OREGON

Oregon State University

Ball, Daniel. Columbia Basin Agricultural Research Center, Pendleton, Oregon. (Chemical fallow, chemical seedbed preparation, glossary, dry and winter peas, canola, irrigated winter wheat east of Cascades)

Brewster, Bill D. Crop and Soil Science Department, Corvallis, Oregon.

Corp, Mary. Umatilla County Extension Agent, Pendleton, Oregon (Conservation Reserve Program)

DeFrancesco, Joe. North Willamette Research and Extension Center, Aurora, Oregon. (Kiwifruit)

Hulting, Andrew. Crop and Soil Science Department, Corvallis, Oregon. (Restricted-use herbicides, winter wheat west of Cascades, grass seed, clover seed)

Jensen, Lynn. Malheur County Extension, Ontario, Oregon.

Kaufman, Diane. North Willamette Research and Extension Center, Aurora, Oregon. (Blackberries, raspberries, strawberries)

Long, Lynn. Wasco County Extension, The Dalles, Oregon. (Integrated fruit production)

Mallory-Smith, Carol. Crop and Soil Science Department, Corvallis, Oregon (Herbicide resistance)

McReynolds, Robert. North Willamette Research and Extension Center, Aurora, Oregon.

Newton, Michael. Forest Science Department, Corvallis, Oregon. (Forestry)

Peachey, Ed. Horticulture Department, Corvallis, Oregon. (Introduction, herbicide residues, horticultural weed management, nurseries, orchard crops, blackberries and raspberries, grapes, blueberries, vegetables, Christmas trees, professional landscape maintenance)

Oregon Department of Agriculture

Coombs, Eric M. Noxious Weed Control Program, Salem. (Biological control)

WASHINGTON

Washington State University

Andreas, Jennifer. King County Extension, Renton, Washington (Biological control)

Daniels, Catherine. Washington State Pest Management Resource Service, Puyallup, Washington. (Pesticide safety)

Miller, Timothy. Department of Crop and Soil Sciences, Mount Vernon, Washington. (Green peas, ornamental bulbs, vegetable seed crops)

Parker, Robert. Department of Crop and Soil Sciences, Prosser, Washington. (Agrichemicals, forage and seed alfalfa, aquatics, asparagus, birdsfoot trefoil, corn, cottonwoods for pulp, grass hay, herbicide names and mixtures, hops, mint, noncropland and rights-of-way, problem weeds, small pastures)

Patten, Kim. Research and Extension Unit, Long Beach, Washington. (Cranberries)

Piper, Gary. Department of Entomology, Pullman, Washington. (Biological control)

Stahnke, Gwen. Department of Crop and Soil Sciences, Puyallup, Washington. (Turfgrass)

Yenish, Joseph. Department of Crop and Soil Sciences, Pullman, Washington. (Nonirrigated winter wheat east of Cascades, spring wheat, lentils, garbanzo beans, winter oats with peas or vetch)

U.S. Department of Agriculture

Boydston, Rick. USDA-ARS, Prosser, Washington.

Young, Frank. USDA-ARS, Pullman, Washington.

IDAHO

University of Idaho

Hutchinson, Pamela. Department of Plant, Soil, and Entomological Sciences, Aberdeen, Idaho. (Potatoes)

Hirnyck, Ronda. Department of Plant, Soil, and Entomological Sciences, Boise, Idaho. (Pesticide safety)

Milan, Joseph. Bureau of Land Management, State Office, Boise (Biological control)

Morishita, Don. Department of Plant, Soil, and Entomological Sciences, Twin Falls, Idaho. (Barley, dry and lima beans, herbicide resistance, oats, sugar beets)

Prather, Timothy. Department of Plant, Soil, and Entomological Sciences, Moscow, Idaho. (Pasture and rangeland)

Schwarzlaender, Mark. Department of Plant, Soil, and Entomological Sciences, Moscow, Idaho. (Biological control)

Thill, Donald. Department of Plant, Soil, and Entomological Sciences, Moscow, Idaho. (Herbicide resistance)

Wilson, Linda. Department of Plant, Soil, and Entomological Sciences, Moscow, Idaho. (Biological control)

CONTENTS

(In page order. Also see contents by subject, in alphabetical order, on pages iv–v and see graphic index on outside back cover.)

	Page		Page
AUTHORS AND CONTRIBUTORS	vi	Kiwifruit	252
WEED MANAGEMENT OPTIONS: A QUICK GUIDE	1	Blueberries, Gooseberries, Currants, and Elderberries	255
Year-round Weed Management Strategies: A Summary	2	Cranberries.....	259
Biological Control	3	Strawberries	261
Current Status of Biological Weed Control Agents.....	4	Weed Management in Vegetable Crops	266
Biological Agents and Their Roles	6	Preharvest Interval for Vegetables.....	268
USE PESTICIDES SAFELY	7	Site Preparation, Stale Seedbeds, and Selective Postemergence Applications	269
AGRICHEMICALS AND THEIR PROPERTIES	18	Registered Uses of Aim Herbicide in Food Crops	271
Herbicide Names and Mixtures.....	37	Registered Uses of Glyphosate	272
Restricted-use Herbicides.....	53	Crop Rotation Intervals	274
Testing for and Deactivating Herbicide Residues.....	54	Artichokes	275
Managing Herbicide-resistant Weeds	55	Asparagus	276
AGRONOMIC WEED CONTROL	62	Beans (snap)	279
Cereal Grain Crops—Small Grains	62	Beets (red or table).....	283
Barley.....	63	Brassica (cole) Crops	284
Oats	69	Carrots, Celery, and Parsnips	287
Winter Wheat		Corn (sweet).....	289
Nonirrigated East of Cascades.....	71	Cucurbit and Vine Crops.....	295
Irrigated East of Cascades	81	Garlic.....	297
West of Cascades	87	Leaf Crops (lettuce, spinach, and beet greens).....	299
Spring Wheat	101	Onions	301
Chemical Fallow East of Cascades	107	Peas (green or English)	304
Conservation Reserve Program	109	Rhubarb	307
Chemical Seedbed Preparation (Grains)	112	Tomatoes, Peppers, and Eggplants.....	308
Small Grains Underseeded with Peas, Vetch, and Small-seeded Legumes	112	Vegetable Seed Crops.....	310
Grass Seed Crops	113	Vegetation Management in Christmas Trees	317
Grass Hay	130	Weed Control in Nursery, Greenhouse, and Bulb Crops	324
Alfalfa (forage).....	133	Site Preparation.....	324
Alfalfa (seed)	140	Weed Control in Container-grown Stock.....	325
Birdsfoot Trefoil.....	146	Weed Control in Field-grown Stock and Holly	329
Clovers	147	Greenhouse Floors	334
Legumes (large-seeded).....	150	Conifer Seedbeds	335
Beans (dry and lima) East of Cascades	150	Ornamental Bulb, Rhizome, Corm, and Tuber Crops	336
Peas (dry)	154	PROFESSIONAL LANDSCAPE MAINTENANCE	339
Peas (winter)	157	Established Tree, Shrub, Rose, and Ground Cover Landscapes	339
Lentils	158	Established Bulb and Flower Beds	343
Garbanzo Beans (Chickpeas)	160	General Maintenance around Ornamental Plantings	345
Canola (including rape seed)	161	Herbicides for Large Food Gardens—Professional	345
Corn (field, sweet, silage, and seed corn).....	163	TURFGRASS WEED CONTROL	346
Hops	171	Influence of Cultural Practices	346
Mint	172	Chemical Control of Broadleaf Weeds in Turf	347
Potatoes	182	Herbicide Mixtures	350
Sugar Beets	198	Annual Bluegrass Control	352
AQUATICS	203	Annual Grass Weed Control.....	354
FORESTRY	210	Chemical Renovation of Turf	356
Forest Land Brush Control.....	210	HOME LANDSCAPES AND GARDENS	358
Herbicide Effectiveness during Seasons.....	216	Weed Treatments for Home Landscapes	361
Directed Spot Spray, Tree Injection, and Basal Bark Treatment.....	217	Managing Small Pastures.....	362
Spraying with Boomless Ground Equipment or Aircraft	223	PASTURE AND RANGELAND WEED CONTROL	365
Grass and Forb Control for Plantation Establishment	226	NONCROPLAND AND RIGHT-OF-WAY	370
Hybrid Cottonwoods Grown for Pulp.....	228	CONTROL OF PROBLEM WEEDS	378
HORTICULTURAL WEED MANAGEMENT	231	USEFUL TABLES AND CALCULATIONS	416
Orchards, Vineyards, and Berries	231	GLOSSARY	418
Integrated Fruit Production.....	232	INDEX	422
Orchard Crops	233		
Blackberries and Raspberries	244		
Vineyards and Grapes.....	248		

INTRODUCTION

This handbook is designed as a quick and ready reference of weed control practices used in various cropping systems or site/situations in Oregon, Washington, and Idaho. Because chemical regulation of plant growth is complex and requires considerable knowledge, a large portion of the handbook is devoted to registered uses of herbicides, crop desiccants, and some plant growth regulators. Most uses of chemical regulators are based on research results of the Agricultural Experiment Stations or the Oregon State University Extension Service and the neighboring states of Idaho and Washington where circumstances are similar. Otherwise, a few suggestions are included from research conducted in other states or from the U.S. Department of Agriculture Research Center at Beltsville, MD. In all cases, authors make every effort to list only registered herbicides and to ensure that the information conforms with product labels and company recommendations.

Intended Users The handbook was originally planned as a manual for county Extension agents. However, the handbook also may be useful to company field representatives, commercial spray applicators and consultants, herbicide dealers, teachers, and some producers. Persons needing similar information pertaining to a few crops, sites, or situations should request Extension bulletins, fact sheets, or chapters from this handbook from their local county Extension office. Costs for publication and copying should be expected.

Revision and Availability The handbook is revised and reissued annually.

Caution!

This handbook is not intended as a complete guide to herbicide use.

Before using any chemical, read the label on the container. Before a chemical can be recommended for a specific use, it must be thoroughly tested. The recommendation on the manufacturer's label, when followed, can prevent many problems arising from the wrong use of a chemical.

Information is supplied here with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied. Trade names (brand names) of some commercial pesticides are used in portions of this handbook to help identify the common name used by the Weed Science Society of America (WSSA). Authors have assembled the most reliable information available to them at time of publication. Due to constantly changing laws and regulations, authors can assume no liability for the recommendations. Any use of a pesticide contrary to instructions on the printed label is not legal or recommended.

Weed Management Options: A Quick Guide

Prevention

Avoid weed establishment; eliminate individual survivors.

Identify and map weed infestations; keep records over years.

Recognize and eliminate new weeds before they multiply and establish.

Employ sanitary procedures; prevent weed spread.

- Clean equipment between sites or infestations.
- Examine nursery plants, seed, and imported soil or media.
- Screen irrigation water where weed seed contaminates surface water transported in canals and rivers or stored in lakes or ponds.

Control weeds and seed sources around the field or site.

Establish county and state weed laws and noxious weed control programs.

Biological

Manage other organisms against weeds.

Animals

- Geese (dormant strawberries, asparagus, peppermint, caneberries, and trees; avoid during harvest season of crops except orchards).
- Pigs (fallow only; reduce yellow nutsedge infestations).
- Sheep and goats (controls many weed and brush species; may compact soil in orchards).

Insects (classical approach; development costs require use on extensive areas; insect populations lag behind weed population and may be too slow for intensive or high-value cropping systems).

- Klamathweed beetle on St. Johnswort (also called Klamathweed or goat weed).
- Cinnabar moth and ragwort flea beetle on tansy ragwort.
- Others (see "Biological Control" section in this Handbook).

Diseases (several examples of fungal and bacterial cultures for spraying to suppress or kill certain weeds; however, none in Pacific Northwest).

Cultural

Integrate numerous components to minimize impact of weeds.

Select manageable fields (identify weeds and choose crop according to feasibility of weed management strategies; e.g., avoid planting onions into perennial weeds).

Rotate crops (disrupt weed life cycles or suppress weeds in competitive crop followed by planting a noncompetitive crop).

Plant winter cover or competitive fallow crops in rotation to improve soils and crop management (specific cultivars are being evaluated).

- Consider legumes to supplement nitrogen requirements.
- Consider specific varieties of cereals with natural plant toxins (allelopathy); vegetation must remain uniform on soil surface; either perennial or large-seeded crops can be planted through undisturbed mulch.
- Consider crops or cultivars that winter kill after vigorous growth during fall to avoid springtime controls.

Alter planting dates (plant for maximum growth or delay planting to control first weed flush).

AGRICHEMICALS AND THEIR PROPERTIES

BOB PARKER

Revised November 1, 2007

This information provides specifications for users of this handbook. For more information regarding the physiological or biochemical activity and behavior in or on soils, refer to the *Herbicide Handbook of the Weed Science Society of America*.

The acute toxicity LD₅₀ (lethal dose to 50% of the test animals) has been stated for the formulated product when known. Refer to *Managing Herbicide-Resistant Weeds* in this handbook for further information on Site of Action and Chemical Family to delay weed resistance to herbicides.

Caution! This handbook is not intended as a complete guide to herbicide use. Before using any chemical, read the container's label. A chemical must be thoroughly tested before it can be recommended for a specific use. Following the label's recommendation can prevent many problems from arising due to wrong use of a chemical.

ACETOCHLOR

Trade name(s) Harness, Surpass, Cadence, TopNotch, Degree

Manufacturer(s) Monsanto Co., Dow AgroSciences

Formulation(s) 6.4 and 7 lb/gal emulsifiable concentrate; 3.2 lb/gal capsule suspension

Remarks A selective, soil-active herbicide applied preplant or preemergence to corn.

Water solubility 223 ppm

Storage conditions Store in a cool, dry, well-ventilated area away from sources of heat or flame.

Acute toxicity LD₅₀ - 2,148 mg/kg

Action in plant Disrupts protein synthesis.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

ACIFLUORFEN

Trade name(s) Blazer, Snapback

Manufacturer(s) BASF Corp.

Formulation(s) 2 lb/gal water miscible concentrate

Remarks A selective preemergence or postemergence contact herbicide for use in certain large-seed legume crops.

Water solubility 250,000 ppm

Storage conditions Store above 32°F. Warm and shake, if frozen.

Acute toxicity LD₅₀ - 3,330 mg/kg

Action in plant Acts as a selective contact that disrupts cell membrane.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Diphenylether

ACROLEIN (RESTRICTED-USE HERBICIDE)

Trade name(s) Magnacide H

Manufacturer(s) Baker Petrolite

Formulation(s) 92% liquid

Remarks A highly volatile, contact, aquatic herbicide. Use only under the supervision of licensed pesticide applicators.

Water solubility 215,000 ppm

Storage conditions Highly reactive or forms insoluble polymers (white precipitate) in presence of oxygen. Therefore, avoid contamination with any foreign materials, especially alkaline or strong acids. Do not store opened product.

Acute toxicity LD₅₀ - 46 mg/kg

Action in plant General cell toxicant that destroys enzyme systems.

Site of action General cell toxicant

Chemical family None generally accepted

ALACHLOR (RESTRICTED-USE HERBICIDE)

Trade name(s) Arena, Partner, Micro-Tech, Shroud, INTRRO

Manufacturer(s) Monsanto Co.

Formulation(s) 4 lb/gal emulsifiable concentrate; 15% granule; 65% water-dispersible granules

Remarks A selective, soil-active herbicide applied preplant or preemergence. Shallow, mechanical soil incorporation may be necessary to improve weed control.

Water solubility 242 ppm

Storage conditions Store above 32°F away from heat or flame. Warm to 72°F and roll or shake frequently if frozen.

Acute toxicity LD₅₀ - 1,800 mg/kg

Action in plant Inhibits roots and shoots.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Chloroacetamide

AMETRYN

Trade name(s) Evik

Manufacturer(s) Syngenta

Formulation(s) 80% wettable powder

Remarks A selective, contact herbicide with some soil residual activity. Postemergence treatments must be directed on most crops. Absorbed through foliage and roots; penetrates foliage rapidly, minimizing its removal by rain.

Water solubility 185 ppm

Storage conditions Slight sensitivity to extreme temperatures and natural light.

Acute toxicity LD₅₀ - 1,750 mg/kg

Action in plant Inhibits photosynthesis.

Site of action Group 5: photosystem II inhibitor

Chemical family Triazine

AMINOPYRALID

Trade name(s) Milestone

Manufacturer(s) Dow AgroSciences

Formulation(s) 2 lb (ae) soluble concentrate

Remarks A selective, foliage-applied herbicide used to control broadleaf weeds with some residual activity in the soil.

Water solubility 2,480 ppm

Herbicide Names and Mixtures

BOB PARKER

Revised December 13, 2007

Descriptions of chemicals' properties are in the section *Agrichemicals and Their Properties*.

Trade Name	Common Name	Herbicides in Mixture	Mfgr.
AAtrex	atrazine		
ATA	amitrole		
ATZ	amitrole		
Accent	nicosulfuron		
Accent Gold		6.5% nicosulfuron + 6.5% rimsulfuron + 19.1% flumetsulam + 51.7% clopyralid/lb	DuPont
Accelerate	endothall		
Acclaim Extra	fenoxaprop		
Accord	glyphosate		
Accord SP	glyphosate		
Accord XRT	glyphosate		
Acumen	pendimethalin		
Accurate	metsulfuron		
Achieve	tralkoxydim		
Acquire	glyphosate		
Affinity Broadspec		25% thifensulfuron + 25% tribenuron/lb	DuPont
Affinity TankMix		40% thifensulfuron + 10% tribenuron/lb	DuPont
Agility		27.3% thifensulfuron + 13.6% tribenuron + 10.9% metsulfuron/lb	DuPont
Agility SG		57.8% dicamba + 4.7% thifensulfuron + 2.4% tribenuron + 1.9% metsulfuron/lb	DuPont
Aim	carfentrazone		
Alanap	naptalam		
Alecto 41HL	glyphosate		
Alecto 41s	glyphosate		
Alecto 41UL	glyphosate		
Ally	metsulfuron		
Ally Extra		37.5% thifensulfuron + 18.75% tribenuron + 15% metsulfuron/lb	DuPont
Alphanex	desmedipham		
Amber	triasulfuron		
Amine 4	2,4-D amine		
Ansar	MSMA		
AquaCure	copper		
Aquamaster	glyphosate		
AquaNeat	glyphosate		
AquaPier	imazapyr		
AquaPro	glyphosate		
Aqua Star	glyphosate		
Aquathol	endothall		
Aquatic Weed Killer	xylene		
Arcadian sodium arsenite	sodium arsenite		
Arena	alachlor		
Arsenal	imazapyr		
Arsonate	MSMA		
Arrow	clethodim		
Assert	imazamethabenz		
Assure II	quizalofop		
Asulox	asulam		

MANAGING HERBICIDE-RESISTANT WEEDS (contd.)

Group Number and Site of Action¹	Chemical Family	Common Name	Trade Name(s)	Resistant Weeds in the PNW	States with Resistant Weeds
Group 2 Acetolactate synthase (ALS) inhibitors	imidazolinones	*imazamox	Raptor, Beyond, Clearmax (Beyond + MCPA)	downy brome spiny sowthistle	OR WA
		*imazapic	Plateau		
		*imazapyr	Arsenal, Chopper, several others		
		*imazethapyr	Pursuit	prickly lettuce kochia spiny sowthistle black mustard mayweed chamomile	ID ID ID ID ID
	sulfonylureas	*chlorsulfuron	Glean, Telar	prickly lettuce kochia Russian thistle Italian ryegrass mayweed chamomile smallseed falseflax	ID, OR, WA ID, OR, WA ID, OR, WA OR ID, WA OR
			Finesse	smallseed falseflax	OR
		*ethametsulfuron	Muster		
		*halosulfuron	Sandea		
		mesosulfuron	Osprey	Italian ryegrass	ID
		mesosulfuron + propoxycarbazone	Olympus Flex		
		*metsulfuron	Ally, Escort, Cimarron	prickly lettuce kochia Russian thistle smallseed falseflax	ID, OR OR OR OR
		*nicosulfuron	Accent		
		*primisulfuron	Beacon	downy brome	OR
		*prosulfuron	Peak		
		*rimsulfuron	Matrix		
		*sulfometuron	Oust, Spyder		
		*sulfosulfuron	Maverick, Outrider, Certainty	downy brome	OR
		thifensulfuron	Harmony	Spiny sowthistle prickly lettuce mayweed chamomile	WA ID ID
		thifensulfuron + tribenuron	Harmony Extra, Affinity		
		*thifensulfuron + tribenuron + metsulfuron	Canvas		
		*triasulfuron	Amber	prickly lettuce kochia Russian thistle Italian ryegrass	ID, OR OR OR ID
		tribenuron	Express	prickly lettuce mayweed chamomile	ID ID
		*triflusulfuron	UpBeet		
	sulfonylaminocarbonyl-triazolinones	flucarbazone	Everest	Italian ryegrass	ID
		propoxycarbazone	Olympus		
	triazolopyrimidines	florasulam	Orion (contains MCPA); registration pending		

Winter Wheat—Nonirrigated East of Cascades

JOE YENISH AND DAN BALL

Revised December 14, 2007

WINTER WHEAT—Nonirrigated East of Cascades— Downy Brome

- trifluralin (Treflan and others)

Rate 0.75 lb ai/A (1.5 pints/A Treflan)

Time Apply after final seedbed preparation any time from 3 wk to immediately before planting with a deep-furrow drill, or after planting with a double-disk drill.

Remarks Incorporate within 8 hr after application with a flextime harrow in two directions at right angles. Deep furrow seeding must follow preplant incorporation. Incorporation after planting must be shallow. See label for crop rotation limitations.

Site of action Group 3: microtubule assembly inhibitor

Chemical family Dinitroaniline

- diclofop (Hoelon)

Rate 0.75 to 1 lb ai/A (2 to 2.67 pints/A Hoelon)

Time Apply before planting and incorporate thoroughly no more than 2 inches deep.

Remarks Incorporate in two directions at right angles within 48 hr after application. Do not graze or harvest treated fields for forage. Do not apply more than once in a growing season. See label for application rate based on soil organic matter.

Caution **A restricted-use herbicide.** If used on soil with more than 3% organic matter, may provide only suppression.

Site of action Group 1: acetyl CoA carboxylase (ACCase) inhibitor

Chemical family Aryloxyphenoxy propionate

- metribuzin (Sencor)

Rate 0.25 to 0.38 lb ai/A (0.33 to 0.5 lb/A of the 75% DF)

Time Apply when wheat is tillering and has developed 2-inch secondary roots.

Remarks Plant the seed at least 1.5 inches deep and increase seeding rate by 10%. Apply before November 15 or after February 1. Do not apply after wheat begins to joint. Follow label regarding soil type and organic matter. If metribuzin is applied sequentially, allow at least 45 days between applications except for spring split applications, which can be as close as 10 days apart. Do not graze treated fields for 14 days after application.

Site of action Group 5: photosystem II inhibitor

Chemical family Triazine

- metribuzin (Sencor) +
- chlorsulfuron + metsulfuron (Finesse)

Rate 0.25 to 0.38 lb ai/A metribuzin (0.33 to 0.5 lb/A of the 75% DF) + 0.23 to 0.3 oz ai/A Finesse (0.3 to 0.4 oz/A Finesse)

Time Apply when wheat is tillering and has developed 2-inch secondary roots.

Remarks Plant seed at least 1.5 inches deep and increase the seeding rate by 10%. Apply before November 15 or after February 1. Do not apply after the wheat begins to joint. Follow the

label regarding soil type and organic matter. Do not apply more than once per crop. Do not graze treated fields for 14 days after application.

Caution Do not use on soils above pH 7.9. Finesse can persist in soil. Carefully follow label instructions on crop rotations. Many crops may not be planted for 2 yr or longer after applying.

Site of action (metribuzin) Group 5: photosystem II inhibitor; (chlorsulfuron and metsulfuron) Group 2: acetolactate synthase (ALS) inhibitor

Chemical family (metribuzin) triazine; (chlorsulfuron and metsulfuron) sulfonyleurea

triallate (Far-Go)

suppression only

Rate 1.5 lb ai/A (15 lb/A Far-Go Granular)

Time Apply preplant and incorporate.

Remarks Use the granular formulation. Incorporate lightly in two directions at right angles. Some stand thinning may occur on clay knobs or where wheat is dusted in, due to dry conditions. Do not graze.

Site of action Group 8: lipid synthesis inhibitor but not an ACCase inhibitor

Chemical family Thiocarbamate

- sulfosulfuron (Maverick)

Rate 0.031 lb ai/A (0.67 oz/A Maverick) plus 0.5% nonionic surfactant

Time Apply to wheat preemergence up to jointing stage of growth. For best control of brome species, apply fall postemergence when brome is in two- to three-leaf stage. To suppress brome species in spring, apply up to five-tiller growth stage.

Remarks Early spring applications should be when brome has recovered from cold weather, when most foliage is green, not red or purple.

Caution Do not use within 60 days of crop emergence if an organophosphate insecticide has been applied in-furrow. Do not tank-mix with malathion. Do not plant any crop other than wheat for 1 yr after application.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonyleurea

- propoxycarbazone-sodium (Olympus)

Rate 0.026 to 0.039 lb ai/A (0.6 to 0.9 oz/A Olympus) plus 0.25 to 0.5% nonionic surfactant

Time Apply to wheat after emergence but before jointing begins. May be applied in fall or spring or sequentially. Base application timing on crop stage, not weed stage.

Remarks Do not exceed 1.2 oz/A Olympus per crop year.

Caution Do not use with organosilicone-based surfactants.

Site of action Group 2: acetolactate synthase (ALS) inhibitor

Chemical family Sulfonylaminocarbonyltriazolinone

WINTER WHEAT—Irrigated East of Cascades—Preharvest Weed Control (contd.)

- 2,4-D (several trade names)

Rate 0.48 to 1.425 lb ae/A (1 to 3 pints/A product)

Time Apply when wheat is in at least the soft dough stage.

Remarks Consult label; labels differ among manufacturers. Results are best on actively growing weeds. Use higher rate to suppress perennial weeds.

Caution Do not graze dairy animals or meat animals being finished for slaughter in treated fields within 14 days of application. If using 1.425 lb/A (3 pints/A), do not feed treated straw to livestock.

Site of action Group 4: synthetic auxin

Chemical family Phenoxy acetic acid

- carfentrazone (Aim)

Rate 0.016 to 0.031 lb ai/A (1 to 2 fl oz/A Aim EC or Aim EW)

Time Apply when crop is mature and the grain has begun to dry down.

Remarks Adding a nonionic surfactant, methylated seed oil, or crop oil concentrate is required. Good spray coverage is essential. After applying Aim, registered crops may be planted anytime. Root and leafy vegetables may be planted 30 days after application. All other crops may be planted 12 mo after application.

Caution Do not exceed 0.031 lb ai/A Aim (2 fl oz/A product) per season including that which may have been applied during the growing season.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Triazinone

Herbicide Effectiveness on Annual Weeds in Wheat (East of Cascades)

DAN BALL

Reviewed November 28, 2007

Weed Family	triasulfuron (Amber)	chlorsulfuron + metsulfuron (Finesse)	diclofop (Hoelon)	diuron (Karmex, Direx)	metribuzin	thifensulfuron + tribenuron (Harmony Extra)	tribenuron (Express)	2,4-D	dicamba + 2,4-D	dicamba	MCPA	bromoxynil	bromoxynil + dicamba	bromoxynil + MCPA	bromoxynil + MCPA + dicamba	diuron + bromoxynil	metribuzin + bromoxynil	metribuzin + chlorsulfuron	dicamba + chlorsulfuron
Borage Bugloss, common (Alkanet) <i>Anchusa officinalis</i>	—	G	P	E	G	—	—	P	F	P	P	G	E	G	E	E	E	E	—
Corn gromwell <i>Lithospermum arvense</i>	G	G	P	E	P	G	G	P	F	P	P	G	E	E	E	E	P	F	G
Fiddleneck <i>Amsinckia intermedia</i>	E	E	P	E	F	G	G	F	G	P	F	G	E	E	E	E	F	G	G
Madwort (Catchweed) <i>Asperugo procumbens</i>	—	E	P	P	F	E	E	F	F	F	P	P	G	G	G	G	G	G	—
Buckwheat Buckwheat, wild <i>Polygonum convolvulus</i>	G	G	P	G	P	G	P	P	F	G	P	P	F	P	F	P	P	G	E
Knotweed, prostrate <i>Polygonum aviculare</i>	F	G	P	P	G	G	P	P	G	E	P	P	E	G	E	F	G	E	G
Buttercup Buttercup, bur (Little bur) <i>Ranunculus testiculatus</i>	E	E	P	G	G	E	E	P	F	P	P	P	G	G	F	G	G	E	—
Carrot Bur chervil (Bur beakchervil) <i>Anthriscus scandicina</i>	E	E	P	P	P	E	E	P	F	G	E	P	E	G	E	P	P	E	—
Hemlock, poison <i>Conium maculatum</i>	—	E	P	F	P	—	—	F	G	P	P	P	F	F	F	P	P	G	—
Figwort Speedwell, ivyleaf <i>Veronica hederifolia</i>	F	F	P	P	E	F	F	P	F	P	P	P	F	P	F	P	E	E	E

Registered Uses of Aim Herbicide in Food Crops

Crop, Crop Group, and Crop Subgroup	Crops	Approved Applications ¹	Aim EC Maximum Use Rate per Season ²	
			fl oz/A	lb ai/A
Vegetable, root (Subgroups 1A & 1B)	Beet; Carrot; Ginger; Horseradish; Parsnip; Potato; Potato, sweet; Radish; Sugar beet; Yam; Turnip	H	6.1	0.096
Vegetable, leaves (Group 2)	Beet; Carrot; Radish; Sugar beet; Turnip tops; Chicory	H		
Vegetable, bulb (Group 3)	Chive; Garlic; Leek; Onion; Onion, dry bulb; Shallot	H		
Vegetable, leafy (Group 4)	Arugula; Celery; Cress; Endive; Fennel; Lettuce, head and leaf; Parsley; Purslane; Radicchio; Rhubarb; Spinach; Swiss chard	H		
Vegetable, brassica (Group 5)	Broccoli; Brussels sprout; Cabbage; Cauliflower; Collards; Kale; Kohlrabi; Greens; Mustard greens; Mustard spinach	H		
Vegetable, legume (Group 6)	Bean, kidney; Bean, lima; Bean, pinto; Bean, snap; Bean, wax; Chickpea; Edamame; Lentil; Pea, blackeyed; Pea, edible; Pea, succulent-shelled; Soybean	H, HA		
Vegetable, foliage of legume (Group 7)	Bean; Cowpea; Catjang; Edamame; Guar; Lentil; Lupine; Pea	H, HA		
Vegetable, fruiting; Okra (Group 8)	Eggplant; Groundcherry; Pepper (bell, chili, cooking, pimento, sweet); Pepino; Tomatillo; Tomato	H		
Vegetable, cucurbit (Group 9)	Cantaloupe; Cucumber; Gherkin; Muskmelon; Pumpkin; Squash, summer and winter; Watermelon	H		
Herbs and Spices (Group 19)	Basil, fresh and dried; Chive; Cinnamon; Clove; Dill; Fennel; Nutmeg; Parsley; Pepper, black and white; Rosemary; Vanilla	H		
Bushberry (Subgroup 13B)	Blueberry, high- and lowbush; Currant; Elderberry; Gooseberry; Huckleberry	D, BD		
Seed crops	Rapeseed; Mustard; Flax; Sunflower; Safflower; Crambe; Borage	H		
Strawberry		H		
Horseradish		H		
Vegetable, tuberous and corm (Subgroups 1C & 1D)	Arracacha; Arrowroot; Artichoke, Chinese; Artichoke, Jerusalem; Canna, edible; Cassava, bitter and sweet; Chayote root; Chufa; Dasheen (taro); Ginger; Leren; Potato; Potato, sweet; Tanier; Turmeric; Yam bean; Yam, true	H	11.6	0.181
Caneberry (Subgroup 13A)	Blackberry; Loganberry; Raspberry, red and black cultivars and/or hybrids of these	H, D ³ , DD	25.6	0.40
Pome fruit (Group 11)	Apple; Crabapple, Loquat, Mayhaw, Pear; Pear, oriental; Quince	H	7.9	0.124
Stone fruit (Group 12)	Apricot; Cherry, sweet and tart; Nectarine; Peach; Plum; Plum, chicksaw, damson, Japanese); Plumcot; Prune	H	7.9	0.124
Tree nut (Group 14)	Almond; Beech nut; Brazil nut; Butternut; Cashew; Chestnut; Chinquapin; Filbert (hazelnut) ³ ; Hickory nut; Macadamia nut (bush nut); Pecan; Pistachio; Walnut, black and English	H	7.9	0.124
Corn, sweet and field		H, B ⁴ , D ⁴	2.0	0.031
Hops		H, D ⁵	7.6	0.12
Grape		H, D ⁵	7.9	0.124
Potato		H, HA	11.6	0.181

¹ Approved applications: B = broadcast; BD = broadcast dormant; D = directed, nondormant crop; DD = directed dormant crop; H = hooded in row middles; HA = harvest aid.

² The total allowable usage includes all applications made to the field per calendar year. This includes fallow treatments, burndown treatments, and all in-season treatments, including harvest aid.

³ Primocane suppression.

⁴ Use directed applications for corn that is at growth stage V8 or greater.

⁵ Control of suckers at base of plant.

Crop Rotation Intervals (Months) for Common Soil-active Herbicides Used in Vegetables and Other Rotational Crops

(also see footnotes, next page)

Herbicide	Beans (snap)	Beets (table)	Broccoli, Cauliflower & Cabbage	Carrot	Collards	Corn (sweet)	Cucumbers	Eggplants	Lettuce	Onions & Leeks	Peas	Peppers	Pumpkins & Squash	Spinach	Swiss chard	Tomato	Cereals
Accent	10	10/18 ¹	10/18 ¹	10/18 ¹	10/18 ¹	10	10/18 ¹	10/18 ¹	10/18 ¹	10/18 ¹	10	10/18 ¹	NSP ²				
Assure	0	0	4	4	4	4	4	4	4	4	0	4	4	4	-	4	-
Buctril	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Callisto	18	18	18	18	18	0	18	18	18	18	18	18	18	18	18	18	3
Command	0/9	12	12 ³	12	12	9	0/9	12	12	12	9	0/9 ⁴	0/9 ⁵	12	12	9	12
Curbit	-	8/13 ⁷	-	-	-	-	0	-	-	-	-	-	0	8 ⁶	-	-	8 ⁸
Dacthal	8	8	0	8	0	8	8	8	8	8	8	8	8	8	0	8	8
Dual Magnum	0	0	NSP ⁹	NSP	NSP	0	NSP	NSP	NSP	NSP	0	NSP	NSP	NSP	NSP	0	4.5
Eptam	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goal	2	2/3 ¹¹	4	3	4	10	3/4 ¹⁰	4	3/4 ¹⁰	6	2	3/4 ¹⁰	3/4 ¹⁰	4	4	1/4 ¹²	10
Impact	18	18	18	18	18	0	18	18	18	18	9	18	18	18	18	18	3
Lorox	12	12	12	0	12	0	12	12	12	12	12	12	12	12	12	12	12
Nortron	6/12 ¹³	0	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	6/12 ¹³	0/12 ¹³
Outlook	FS ¹⁴	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	0/4 ¹⁵
Prefar	4 ¹⁶	-	0	0	0	4 ¹⁶	0	0	0	4 ^{16,17}	4 ¹⁶	0	0	4	4 ¹⁶	-	4 ¹⁶
Prowl	0	12/14 ¹⁹	NS/24 ¹⁸	NS/24 ¹⁸	NS/24 ¹⁸	NS/24 ¹⁸	NS/24 ¹⁸	NS/24 ¹⁸	NS/24 ¹⁸	NS/24 ¹⁸	0	NS/24 ¹⁸					
Pursuit	4	40	40	40	40	18	40	40	18	40	4	40	40	40	40	40	4/10 ²⁰
Pyramin	FS ¹⁴	0	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	-	FS	-
Raptor	0	26	18	18	18	8.5	18	18	9	9	0	18	9	18	18	18	3/4/18 ²¹
Sandea	9	24	18	15	18	3	9	12	18	18	9	10	9	24	-	8	2
Sencor	12	18	12	0	12	4	12	12	12	12	8	12	12	12	12	4	4
Spartan	12	36	12	12	12	18	12	12	12	12	0/2 ²²	12	12	12	12	12	4/12 ²³
Spin-Aid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Stinger	12	0	12	18	0	0	12	12	18	12	18	12	12	0	12	18	12
Treflan	0	12/14 ²⁵	0	0	0	5	5	5	5	5	-	0/5 ²⁴	5	12/14 ²⁵	5	0/5 ²⁴	12/14 ²⁶

Crop Rotation Intervals: Footnotes

Aim, Basagran Gramoxone, Poast, Ro-Neet, Roundup, Select, and Touchdown: No rotation restrictions listed for these crops.

¹ PH <6.5 = 18 mo

² NSP = next spring

³ cabbage 0 mo if transplanted; 9 mo if direct-seeded or >2 pints/A

⁴ 9 mo at 1.25 lb ai/A

⁵ pumpkins, 0 mo if <1.3 pints/A; winter squash, 0 mo if <2 pints/A; other cucurbits = 9 mo

⁶ 8 mo if >1.3 pints/A

⁷ 13 mo if >3 pints/A; 8 mo if <3 pints/A and moldboard plowed

⁸ oats

⁹ NSP = next spring

¹⁰ 4 mo if >1 pint/A

¹¹ 3 mo if >1 pint/A

¹² transplanted, 1 mo; seeded, 2 mo at 1 pint/A, 4 mo >1 pint/A

¹³ 12 mo if >12 oz; 0 mo for ryegrass

¹⁴ FS = following spring

¹⁵ 0 mo for sorghum

¹⁶ 4 mo; soil must be tilled to 4 inches

¹⁷ 4 mo on dry bulb in Willamette Valley, with soil tilled to 4 inches; 0 mo in other areas

¹⁸ NS (next spring crop) if <2 lb ai/A; otherwise, 24 mo

¹⁹ 12 mo after spring application; 14 mo after fall application

²⁰ 4 mo for wheat and rye; 10 mo for barley

²¹ 3 mo for wheat; 4 mo for rye; 9–18 mo for barley depending on rainfall and pH

²² 0 mo for dry shell peas

²³ 4 mo for wheat

²⁴ 5 mo before seeding; 0 mo before transplanting

²⁵ 12 mo after spring application; 14 mo after fall application

²⁶ 12 mo after spring application; 14 mo after fall application for cereals and grasses

Artichokes (Globe)

ED PEACHEY

Revised November 16, 2007

ARTICHOKES—Established Plantings

- napropamide (Devrinol 50DF)

Rate 4 lb ai/A (8 lb/A)

Time Apply before weed emergence within established crop only.

Remarks Irrigation, rain, or shallow incorporation (2 to 4 inches) is recommended within 2 weeks after application in November through February, or within 24 hr when applied March through October. Performance is reduced if plant residues are on soil surface. Inhibits root growth.

Site of action Group 15: inhibits very long chain fatty acid synthesis

Chemical family Acetamide

- oxyfluorfen (Goal 2xL)

Rate 1 to 1.5 lb ai/A (4 to 6 pints/A)

Time Apply as a directed treatment or during midsummer dormant and renovation period, either preemergence or early postemergence as a single treatment or in split applications 8 to 10 weeks apart. Acts as a contact, either directly on broadleaf weeds or at soil surface as weeds emerge.

Caution Do not exceed 6 pints/A per year. Preharvest interval is 5 days.

Site of action Group 14: protoporphyrinogen oxidase inhibitor

Chemical family Diphenylether

- sethoxydim (Poast)

Rate 0.47 lb ai/A (2.5 pints/A)

Time Apply to actively growing grasses. Always add crop oil concentrate.

Remarks May be applied by air. Feeding restriction. Preharvest interval is 7 days.

Caution Do not exceed 5 pints/A per year.

Site of action Group 1: acetyl CoA carboxylase (ACCase) inhibitor

Chemical family Cyclohexanedione

INDEX

A

- AAtrex (see atrazine)
- Abutilon theophrasti* (see velvetleaf)
- Accelerate (see endothall)
- Accent (see also nicosulfuron)
rotation interval 274
- Accent Gold
components of 37
- Accent Gold WDG
in corn 168
- Acclaim (see fenoxaprop)
- Accord (see glyphosate)
- Accurate (see metsulfuron)
- Acer circinatum* (see maple, vine)
- Acer macrophyllum* (see maple, bigleaf)
- Aceria malherbae* 4, 6
- Acetic acid
in gardens and landscapes (home) 360
in nursery stock (container-grown) 328
- Acetochlor
and herbicide resistance, 60
in corn 164
properties of 18
restricted-use herbicide 53
- Achieve (see tralkoxydim)
- Achillea millefolium* (see yarrow, weed)
- Acifluorfen
in gardens and landscapes (home) 360
properties of 18
- Acquire (see glyphosate)
- Acrolein
in aquatic weeds 204
properties of 18
restricted-use herbicide 53
- Acumen (see pendimethalin)
- Aegilops cylindrica* (see goatgrass, jointed)
- Affinity Broadspec
components of 37
in barley 67
in wheat (spring) 105
in wheat (winter) 77
- Affinity TankMix
components of 37
in barley 67
in wheat (spring) 105
in wheat (winter) 77
- African rue (see rue, African)
- Agapeta zoegana* 4, 6
- Agility
components of 37
- Agility SG
components of 37
- Agrilus hyperici* 4, 6
- Agrostemma githago* (see cockle, corn)
- Agrostis tenuis* (see bentgrass, weed)
- Aim (see carfentrazone)
- Alachlor
in beans (dry and lima) 150–152
in corn 163, 170
in corn (sweet) 289
in nursery stock and holly (field-grown) 330
in problem weeds 392, 396, 397, 414
properties of 18
restricted-use herbicide 53
- Alanap (see naptalam)
- Alanap-L (see naptalam)
- Alchemilla occidentalis* (see ladysmantle, western)
- Alder (weed)
in Christmas trees, 323
in forestry 210, 211, 213, 216
red
in forestry 217, 223
- Alecto 41HL (see glyphosate)
- Alecto 41s (see glyphosate)
- Alecto 41UL (see glyphosate)
- Alfalfa (crop)
forage 133
herbicide effectiveness table 139
in pasture and rangeland 369
seed 140
- Algae (aquatic weed) 204, 205
- Alkanet (see bugloss)
- Allium amplexans* (see onion, weed)
- Allium sativum* (see garlic, volunteer)
- Allium vineale* (see garlic, weed)
- Ally (see metsulfuron)
- Ally Extra
components of 37
in barley 67
in wheat (spring) 104
in wheat (winter) 75
- Alnus rubra* (see alder, red)
- Alopecurus myosuroides* (see blackgrass)
- Alphanex (see desmedipham)
- Amaranth
in orchards 239
Palmer
in potatoes 188
Powell
in mint 177
in orchards 239
in wheat (winter) 95
- Amaranthus graecizans* (see pigweed, tumble)
- Amaranthus powellii* (see amaranth, Powell)
- Amaranthus retroflexus* (see pigweed, redroot)
- Amaranthus* spp. (see pigweed)
- Amber (see triasulfuron)
- Ambrosia artemisiifolia* (see ragweed, common)
- Ambrosia grayi* (see bursage, woollyleaf)
- Ambrosia tomentosa* (see bursage, skeletonleaf)
- Amelanchier* spp. (see serviceberry)
- Ametryn
properties of 18
- Amine 4 (see 2,4-D amine)
- Aminopyralid
in Conservation Reserve Program 109
in forestry 210, 215, 217, 219, 221, 222, 226
in grass hay crops 132
in noncropland and rights-of-way 373
in pasture and rangeland 368
in pastures (small) 364
in problem weeds 381, 384, 389, 391, 394, 402, 405, 407, 410, 412
properties of 18
- Ammonium sulfate
in blueberry, gooseberry, currant, and elderberry crops 258
in grapes 251
in kiwifruit 254
- Amsinckia intermedia* (see fiddleneck, coast)
- Anagallis arvensis* (see pimpernel, scarlet)
- Anchusa officinalis* (see bugloss)
- Ansar (see MSMA)
- Anthemis cotula* (see mayweed and dog fennel)
- Anthriscus scandicina* (see bur chervil)
- Anthriscus sylvestris* (see chervil, wild)
- Aphthona cyparissiae* 5, 6
- Aphthona czwalinae* 5, 6
- Aphthona flava* 5, 6
- Aphthona lacertosa* 5, 6
- Aphthona nigriscutis* 5, 6
- Aplocera plagiata* 4, 6
- Apples (see orchard crops)
- Apricots (see orchard crops)
- AquaCure (see copper)
- Aquamaster (see glyphosate)
- AquaNeat (see glyphosate)
- AquaPier (see imazapyr)
- AquaPro (see glyphosate)
- AquaStar (see glyphosate)
- Aquathol (see endothall)
- Aquathol K (see endothall)
- Aquatic weed control 203
- Aquatic Weed Killer (see xylene)