

OHP HERBICIDE SOLUTIONS™



GREENHOUSE & NURSERY PRODUCTION

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What is a weed?

A weed is commonly defined as any plant growing out of place. This definition may be expanded to indicate that a weed is an unwanted plant that causes difficulty in growing desirable plants. Production ornamental weed problems can range from weeds inside or outside growing facilities to weeds in

and around containers, under benches and in non-crop areas. Weeds can harbor insect pests and diseases and compete for nutrients and space. The presence of weeds also reduces the aesthetic quality and saleability of plants.

Common sites for weed control problems in ornamentals



Container ornamentals in outside production areas. Weeds either in the container or on the base ground cloth or gravel bed.



Weeds in field grown ornamentals or shrubs. Weeds not only compete for water and nutrients but also harbor mice and other pests capable of damaging the plants.



Growing blocks and pads. Weeds are often found in rock pads or weed cloth areas. Cracks in the soil or tears in the cloth provide opportunities for weed development.



Weeds under benches in greenhouses, hoophouses or shade houses. These are prime harborage sites for insects such as thrips, fungus gnats and others.

Sanitation and weed management programs

Just as sanitation is important in insect and disease control programs, it is very important in a good weed management program. The old adage from weed scientists is "One year of weeds, seven years of seeds." While this may be an exaggeration, it serves as a reminder that we need to control weeds both in the growing areas and perimeters to reduce new weed seeds entering our production zones.

In nursery production the first place to look for weeds is around the soil mix or soil filling area. Some weeds such as spurge can produce hundreds of seeds per plant and can easily contaminate

a large volume of soil. Greenhouse situations offer additional problems such as weeds growing under benches and outside of houses. These are not only a source of weed seeds but also harbor insects and diseases. Container grown plants face competition from weeds emerging from the top of the container and also germinating from the weep holes at the bottom of the pot or growing on the weed mat or gravel bed. While sanitation seems to be very simple it needs to be part of a program solution to reduce the overall weed population before other control solutions are considered.

Herbicide Rotation Program

How well a pre-emergent herbicide performs is a matter of the product selected, the application rate, environmental conditions, watering practices, and how many times the product has been used over time. Herbicide rotation is critical in getting the most out of a weed control program.

There is no one herbicide that will control **ALL** weeds. All her-

bicide specimen labels contain a list of weeds controlled. Some are better on grassy weeds; others on broadleaves and some are good on both weed types.

Table 1 (next page) gives examples of herbicides, their mode of action and the weeds they control. This is helpful when considering herbicide products for your weed control program.

Table 1

Active Ingredient	Product	MOA	Strong on Grasses	Strong on Broadleaves
Dimethenamid-p	Tower	15	Yes (selected)	Yes
Isoxaben	Gallery	21	No (limited)	Yes
Dithiopyr	Dimension	3	Yes	No (limited)
Proflaminate	Barricade	3	Yes	No (limited)
Flumioxazin	SureGuard	14	Yes (selected)	Yes

Below are examples of rotational programs for either field grown or container grown ornamentals using pre-emergent granular herbicides. The goal is to change the MOAs from time to time. One challenge with MOA group 3 is that the products in the group are used extensively for grassy weed control and there are few other options. Other considerations are the

weeds controlled by the herbicides, application timing, water incorporation, etc. The use of a burn-down herbicide such as Fire-Worxx™ under benches, walkways, perimeters etc. will eliminate weeds. Use before the weeds go to seed. For container use, a thorough hand weeding prior to herbicide application will help product performance.

Container Grown Soft Ornamentals (Containers Must Be Weed Free Prior To Application)

	Option 1		Option 2		Option 3		Option 4	
Spring	Fortress	MOA 21+3	Snapshot	MOA 21+3	Fortress	MOA 21+3	XL 2G	MOA 3+3
Summer	Freehand	MOA 15+3	Fortress	MOA 21+3	Freehand	MOA 15+3	Fortress	MOA 21+3
Fall	Snapshot	MOA 21+3	XL 2G	MOA 3+3	XL 2G	MOA 3+3	Fortress	MOA 21+3

Container Grown Woody Ornamentals (Containers Must Be Weed Free Prior To Application)

	Option 1		Option 2		Option 3		Option 4	
Spring	Fortress	MOA 21+3	Fuerte	MOA 14	Fortress	MOA 3+21	Biathlon	MOA 14+3
Summer	Biathlon	MOA 14+3	Biathlon	MOA 14+3	Fuerte	MOA 14	Freehand	MOA 15+3
Fall	Marengo G	MOA 29	Freehand	MOA 15+3	Biathlon	MOA 14+3	Marengo G	MOA 29

Hard-To-Control Weeds

Canada Thistle	Casoron	MOA 20	Has post emergent activity
Horsetail	Casoron	MOA 20	Fall applied best, 2 year program minimum
Nutsedge (yellow)	Pennant Tower	MOA 15 MOA 15	Yearly program needed Yearly program needed

Calibrating and using granular herbicides

Growers generally use granular herbicides to cover large container areas or where plants are not tolerant to liquid sprays. While granular products may differ in particle size or rates per acre, application methods are the same. Usually they are applied using hand or powered rotary spreaders or larger air-assisted boom spreaders. Whichever method you choose, it is very important to calibrate your equipment to deliver the proper dose, usually 100-200 lbs. per A (acre). Most herbicide manufacturers offer a plastic calibration pan specific to their product. To calibrate, place several of the calibration pans on the ground. The user makes an application pass over the pans and the granules collect in the pan. OHP has a new style of calibration pan, gold

in color. This pan is ½ sq. ft. in size and has a collection site in one corner. By tipping the pan towards the corner and filling the collection well the user will see how much material fills the clear window and corresponding fill-line markers. The applicator compares the result and adjusts speed or flow settings to apply the correct dose of product. Many calibration pans have corner dimples premeasured for the correct dosage. If the granules fail to fill the dimple or over-fill the dimple, then the applicator must change his pace or adjust the spreader setting. Repeat this calibration process until the proper dose is achieved. It is important for the applicator to go through this process to ensure uniform and proper coverage of the herbicide.

OHP Granular Herbicide Pan Calibration Chart

- 1 The first step to calibrate for any OHP herbicide is to determine the rate required (lbs./A), located in the left hand column below. (To determine the setting for Biathlon, for example, at 100 lbs./A, refer to the Biathlon column. The 100 lbs./A setting is line mark 2.)
- 2 Next, place the calibration pan on the ground, apply the product using a comfortable pace, passing over the pan. When finished, tilt calibration pan up, tap the product evenly into the corner collection well.
- 3 Determine lbs./A by viewing the level of the product within the window line marks. Adjust your pace (slower to increase rate, faster to decrease rate) and equipment settings to deliver the correct rate.

Biathlon, Fuerte are trademarks of OHP, Inc. Fortress is a trademark of AMVAC Chemical Corp. Casoron is a trademark of Arysta LifeScience Group Company.

Rate	Biathlon®	Casoron®	Fortress®	Fuerte®
100 lbs./A	2	3	2	2
150 lbs./A	3	4	3	3
200 lbs./A	4	5	4	4

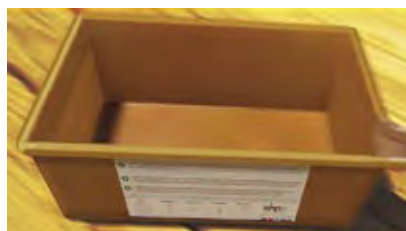
Recommended rate

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Granular application rates per container

	6" Diameter	8" Diameter	10" Diameter	12" Diameter
100 lbs./A	0.20 g	0.36 g	0.57 g	0.82 g
150 lbs./A	0.31 g	0.55 g	0.85 g	1.23 g
200 lbs./A	0.41 g	0.73 g	1.14 g	1.64 g

OHP calibration pan with directions for use sticker



0.5 ft²

OHP Calibration Pan Directions (Pan Sticker):

1. The first step to calibrate for any OHP herbicide is to determine the rate required (lbs./A), located in the left hand column. (To determine the setting for Biathlon at 100 lbs./A refer to the Biathlon column. The 100 lbs./A setting is line mark 2.)
2. Next, place the calibration pan on the ground, apply the product using a comfortable pace, passing over the pan. When finished, tilt the calibration pan up, tap the product evenly into the corner collection well.
3. Determine lbs./A by viewing the level of the product within the window line marks. Adjust your pace (slower to increase rate, faster to decrease rate) and the equipment settings to deliver the correct rate.

Note: Calibration should be done for every operator if using hand held equipment. It is also helpful to repeat this procedure a few times for accurate calibration.

For assistance with calculations or calibration of equipment, contact your OHP representative or university extension agent.

FireWorxx Quick Fill Sheet Guide

	Handcan	Backpack
% FireWorxx	FireWorxx rate per 1 gallon	FireWorxx rate per 4 gallon
3%	4 fl. oz.	16 fl. oz.
6%	8 fl. oz.	32 fl. oz.
9%	12 fl. oz.	48 fl. oz.

FireWorxx™ Product Information:

This product is a fast-acting, non-selective broadleaf weed, grass, algae and moss killer. This product is not translocated. It will burn only those plant parts that are coated with spray solution.

This product can be used any time during the year and works best during sunny, warm and dry conditions. Application during cold weather may delay appearance of plant damage. If rain falls within 3 hours of treatment, an additional spray may be required

Application Directions

Shake well before using. Dilute with water using the chart above as a guide.

Use the 3% solution for small, easy-to-kill weeds less than 5 inches tall and for moss and algae.

Use the 6% solution for larger annual weeds and grasses.

Use the 9% solution for tough to kill perennial weeds, vines, brush and sucker control.

Tank mixing with other herbicides:

Use 1% rate to improve efficacy of other herbicides including glyphosate, glufosinate can be used to improve control of glyphosate-resistant weeds. Observe all the precautions on all tank mix partner labels.

Weeds



Annual Bluegrass, poa



Barnyardgrass, common



Bermudagrass



Bittercress (Cardamine spp)



Carolina Geranium



Carpetweed



Cheat



Chamomile/Mayweed



Chickweed, common



Chickweed, mouse-ear



Clover, white



Crabgrass



Curly Dock



Dandelion, common



Dogfennel

Weeds



Doveweed



Eclipta



Evening Primrose, Common



Fescue, tall



Field Bindweed



Fleabane



Florida Pusley



Foxtail, green



Goosegrass



Groundsel, common



Hairy Bittercress



Hawksbeard



Henbit



Horsetail



Johnson grass

Weeds



Knotweed



Kyllinga, green



Lambsquarters, common



Long Stalked Phyllanthus



Marestail



Morning Glory



Mulberry Weed



Mugwort



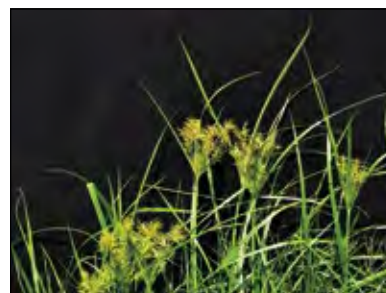
Mustard, wild



Nightshade, black



Northern Willow Herb



Nutsedge, yellow



Orchardgrass



Parthenium



Pepperweed, Virginia

Weeds



Pigweed, Palmer



Plantain, buckhorn



Puncturevine



Purslane, common



Ragweed, common



Ryegrass



Shepherd's Purse



Smartweed



Spurge, prostrate



Spurge, spotted



Sida, prickly/teaweed



Sow Thistle, annual



Thistle, bull



Vetch



Wood Sorrel, Yellow (Oxalis)

WEED MANAGEMENT: Use the following chart to develop a resistance management strategy. ✓ = labeled

TRADE NAME	Biathlon®	Casoron® 4G	Fortress®	Fuerte®
Active Ingredient	Oxyfluorfen + Prodiamine	Dichlobenil	Isoxaben + Dithiopyr	Flumioxazin + Prodiamine
MOA	14+3	20	21+3	14+3
WEED				
Alyssum, Hoary				✓
American black nightshade				
Annual Bluegrass/ poa	✓	✓	✓	✓
Amaranth, palmer, spiny				✓
Aster, Heath			✓	
Barnyardgrass, common	✓		✓	✓
Bearded Sprangetop	✓			
Beggarweed, Florida				✓
Bermudagrass				
Bidens Aristosa				
Bittercress (Cardamine)	✓		✓	✓
Black Medic			✓	
Bromegrass			✓	
Bull Thistle		✓		
Buckwheat, wild				
California Burclover				✓
Camphorweed		✓		
Canada Thistle, common		✓		
Carolina False Dandelion		✓		
Carolina Foxtail				
Carolina Geranium				
Carpetweed		✓	✓	✓
Cat's Ear Dandelion				
Chamberbitter			✓	
Cheat				
Cheatgrass				
Chickweed, common	✓	✓	✓	✓
Chickweed, mouse-ear			✓	✓
Chickweed, sticky				
Clover, white				
Coffee Weed		✓		
Convolvulus Arvensis				
Copperleaf, Virginia				
Corn speedwell				
Crabgrass	✓	✓	✓	✓
Crabgrass, henry				

TRADE NAME	Biathlon®	Casoron® 4G	Fortress®	Fuerte®
Active Ingredient	Oxyfluorfen + Prodiamine	Dichlobenil	Isoxaben + Dithiopyr	Flumioxazin + Prodiamine
MOA	14+3	20	21+3	14+3
WEED				
Crabgrass, large/hairy			✓	✓
Crabgrass, smooth			✓	✓
Crabgrass, Southern			✓	✓
Creeping Dayflower				
Croton, Tropic				✓
Crowfootgrass			✓	✓
Cudweed, linear-leaf/purple	✓	✓	✓	
Cudweed, purple				
Cupgrass, Woolly				✓
Cutleaf, Evening Primrose				
Dallasgrass			✓	
Dandelion, common	✓	✓	✓	✓
Dayflower, Benghal				✓
Deadnettle, Red		✓		
Dichondra				
Dodder				
Dogfennel		✓		✓
Doveweed				✓
Eclipta	✓		✓	✓
Evening Primrose, common		✓		
Fall Panicum	✓		✓	
False Chamomile				
False Dandelion		✓		
Fescue		✓		
Fiddleneck		✓		
Field Pansy				
Filaree, redstem				✓
Fireweed	✓		✓	
Fleabane	✓		✓	
Florida Betony				
Florida Pusley		✓		✓
Foxtail Brome				
Foxtail, giant		✓		✓
Foxtail, green	✓	✓	✓	✓
Foxtail, yellow	✓	✓	✓	✓
Galinsoga, hairy			✓	✓
Geranium, Carolina			✓	✓
Goosefoot		✓		

TRADE NAME	Biathlon®	Casoron® 4G	Fortress®	Fuerte®
Active Ingredient	Oxyfluorfen + Prodiamine	Dichlobenil	Isoxaben + Dithiopyr	Flumioxazin + Prodiamine
MOA	14+3	20	21+3	14+3
WEED				
Goosegrass	✓		✓	✓
Groundsel, common	✓	✓	✓	✓
Guineagrass				
Hairy fleabane	✓		✓	
Hairy nightshade				
Henbit		✓	✓	✓
Horsetail		✓		
Indigo, Hairy				✓
Itchgrass				✓
Jimsonweed				✓
Johnsongrass (from seed)				✓
Jungle Rice				✓
Kikuyu Grass	✓		✓	
Kochia				✓
Knotweed		✓	✓	✓
Kyllinga, annual sedge				
Ladysthumb			✓	✓
Lambsquarters, common		✓		✓
Lamium Amplexicaule				
Lawn Burweed				
Lespedeza, common			✓	
Lettuce, Prickly			✓	
Little Mallow				
Liverwort (suppression)				✓
London Rocket			✓	
Longstalked Phyllanthus				✓
Lovegrass, California				✓
Mallow, common			✓	✓
Mayweed, Chamomile			✓	✓
Marestail	✓	✓	✓	✓
Maypops		✓		
Miner Lettuce		✓		
Morning glory, ivyleaf			✓	✓
Morning glory, Entireleaf				✓
Morning glory, Smallflower				✓
Morning glory, Tall				✓
Mouse Barley				

TRADE NAME	Biathlon®	Casoron® 4G	Fortress®	Fuerte®
Active Ingredient	Oxyfluorfen + Prodiamine	Dichlobenil	Isoxaben + Dithiopyr	Flumioxazin + Prodiamine
MOA	14+3	20	21+3	14+3
WEED				
Moss, spp.				✓
Mulberry Weed				✓
Mustard, black				
Mustard, wild			✓	
Natalgrass		✓		
Nightshade, Black				✓
Nutsedge, purple		✓		
Nutsedge, yellow		✓		
Orchardgrass		✓		
Oxalis, yellow woodsorrel	✓	✓	✓	✓
Panicum, Fall, Texas				✓
Parsley-piert			✓	✓
Parthenium				
Pearlwort	✓		✓	✓
Penn Smartweed		✓		
Pennycress, Field				✓
Pennywort			✓	
Pepperweed, VA	✓	✓	✓	
Pigweed, prostrate	✓		✓	✓
Pigweed, redroot	✓	✓	✓	✓
Pigweed, Smooth				✓
Pigweed, Tumble				✓
Pineapple Weed		✓	✓	✓
Plantain, bracted			✓	
Plantain, broadleaf			✓	✓
Plantain, buckhorn		✓	✓	✓
Plantain, paleseed				
Pokeweed, common			✓	
Prostrate Knotweed		✓		
Prostrate Spurge	✓		✓	
Puncture Vine				✓
Purslane, common		✓	✓	✓
Queen Anne's Lace (Wild Carrot)		✓		
Quackgrass		✓		
Ragweed, common		✓		✓
Ragweed, Giant				✓
Red Brome				
Red Deadnettle		✓		

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Active Ingredient	Oxyfluorfen + Prodiamine	Dichlobenil	Isoxaben + Dithiopyr	Flumioxazin + Prodiamine
MOA	14+3	20	21+3	14+3
WEED				
Redmaids				✓
Rescuegrass (suppression)				✓
Rice Flatsedge				
Rockpurslane, Redmaids			✓	
Russian Knap Weed		✓		
Russian Thistle		✓		
Ryegrass			✓	
Sandbur			✓	
Sedge, annual (Kyllinga)				
Senna, Coffee				✓
Sesbania, hemp		✓		✓
Shepherd's purse	✓	✓	✓	✓
Sicklepod				
Sida, prickly/teaweed		✓	✓	✓
Signalgrass				✓
Smartweed, Pennsylvania				✓
Smooth Brome		✓		
Smutgrass			✓	
Sorrell, Red			✓	
Southern Brassbuttons				
Sowthistle, annual	✓		✓	✓
Spanish Needles		✓		
Sprangletop, Amazon	✓		✓	
Sprangletop, Persian				✓
Speedwell, Broadleaf				✓
Speedwell, Corn			✓	
Speedwell, Thymeleaf			✓	
Spurge, garden	✓		✓	
Spurge, Hyssop			✓	
Spurge, leafy		✓	✓	
Spurge, nodding				
Spurge, prostrate	✓		✓	✓
Spurge, spotted	✓		✓	✓
Starbur, Bristly				✓
Sunflower, common				
Sweetclover, yellow			✓	
Swinecress				
Tansymustard, green			✓	

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MOA	14+3	20	21+3	14+3
WEED				
Tassel flower				
Texas Panicum		✓		
Thickhead				✓
Thistle, bull		✓		
Thistle, Canada				✓
Thistle, Russian		✓		✓
Timothy		✓		
Tropic Ageratum				
Tufted lovegrass				
Velvetleaf				✓
Vetch				
Virginia Pepperweed				
Waterhemp, common, tall				✓
Wild Artichoke		✓		
Wild Aster		✓		
Wild Barley		✓		
Wild Carrot			✓	
Wild Mustard		✓		
Wild Oats			✓	
Wild Onion				
Wild Radish		✓		
Willowherb, northern				
Witchgrass				✓
Woodsorrel, common				✓
Woodsorrel, creeping			✓	
Woodsorrel, yellow			✓	
Yellow Rocket		✓		✓

OHP Herbicide Solutions®

WEED PROBLEM	CROP	OHP SOLUTION

OHP QUICK REFERENCE

Herbicide Product Rate Guide

Product	Rate per acre
Biathlon®	100 lbs.
Casoron® 4G	100 to 200 lbs.
Fortress®	150 lbs.
Fuerte®	100 lbs.
FireWorxx™	3 to 9 gallons per 100 gallon mix

Users should read the entire label for full information and application instructions.

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