



# OHP Weed Solutions<sup>®</sup>

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Volume I

Greenhouse and  
Nursery Production

[ohp.com](http://ohp.com)

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Photo: Pineappleweed (*Matricaria discoidea*)

# 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 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.

## Rotation of different herbicide modes of action

Herbicides, like insecticides and fungicides, work on specific plant or pest metabolism sites, the product’s mode of action (MOA). If the same MOA herbicide or herbicide combination is used continually, it may result in selecting out resistant weeds which means the herbicide may not work as well as before. Since these resistant weeds are better able to cope with the herbicide’s MOA, it gives them a competitive advantage over other weed plants. The result is that these resistant weeds produce more seed and generally “take over” an area. A

prime example has been the emergence of glyphosate-resistant weeds such as marestail. Growers are increasing the concentration of glyphosate mixtures in an attempt to control these weeds. A better solution is to attack the resistant weeds with a different mode of action. The different modes of action can be found on most labels or other resources such as OHP’s Chemical Class Chart. Planning out a rotation strategy utilizing herbicides with different MOAs will increase the effectiveness of your weed control program.

## 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 all granules may be different in particle size or rates per acre, their 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 doses, usually 100-200 lbs. per acre. Most herbicide manufacturers produce a 1 sq. ft. plastic calibration pan specific to their product. To calibrate, place several of the pans on the ground. The user makes an application passing through the pans and the granules collect in the pan. Many calibration pans, such as the Biathlon pan from OHP, 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.

Below is the Biathlon calibration pan and instructions for use.



Granular ornamental herbicide calibration pan used for calibrating applications of Biathlon® Ornamental Herbicide.

### Suggested use:

1. Place the pan on a level surface in a similar area where you will be applying Biathlon® Ornamental Herbicide.
2. Fill your applicator with Biathlon.
3. Moving at a consistent pace (same as during actual application). Open the applicator gate and apply the Biathlon as you pass over the calibration pan. Once past shut off the applicator.
4. Tip the calibration pan toward the desire rate (100 lbs./A) so that the granules collect in that dimple.
5. If the granules are level with the top of the dimple, you are calibrated. If overflowing, decrease the spreader opening. If not full, increase your opening.

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.

## Calibrating and using liquid sprays

Liquid herbicide applications are commonly applied using backpack, hand-held, or boom sprayers. No matter the size of the sprayer, the equipment used must be calibrated to obtain proper coverage.

In order to calibrate your application you must first know a couple of facts about the product and your equipment. First, what is the application rate of the product you are using? Usually it is given in ounces (dry) or fluid ounces (liquid) per acre. What is the spray volume you are using for your application? Common spray volumes range from 50 to 100 gallons per acre. For this example, let's assume your herbicide has an application rate of 10 fl. oz./A and you will apply at a volume of 100 gal./A.

Next you need to determine the spray output of your sprayer. That is, how many gallons per minute is it spraying? A simple way to determine this is to fill your tank with clean water and run the sprayer at its normal pressure. Next collect the spray water from the nozzle using a jar, plastic container, etc. for 15 seconds. Take the volume collected and multiply by four. This gives you the spray volume per minute of your sprayer. For example, if you collected 16 fl. oz. of water in 15 seconds, you have a spray volume of 64 fl. oz. or one half-gallon per minute per spray nozzle. If you have four nozzles, you have the ability to spray two gallons per minute.

Next, choose a measured area to spray for calibration purposes. Many nursery herbicide applications are made using a banded spray. This is typically a 1 foot wide spray on either side of the plant rows. Let's assume you are making a one-foot banded spray. A good size test plot to work with is 25 sq. ft. or a plot 1 foot wide by 25 feet long. We said earlier you want to spray at 100 gal./A, which is the same as 100 gallons per 43,560 sq. ft., so the 25 sq. ft. plot will need 7.3 fl. oz. of spray volume. The calculation is: 100 gal. is to 43,560 sq. ft. as "X" is to 25 sq. ft. (100 multiplied by 25 divided by 43,560 multiplied by 128 (oz./gal.) to get fluid ounces). We said earlier that your spray rig puts out 16 fl. oz. (1 pint) per 15 seconds. So based on this data, you will need to cover the 25 sq. ft. in 6.8 seconds. The calculation is: 16 fl. oz. is to 15 seconds as 7.3 fl. oz. is to "X". (15 multiplied by 7.3 divided by 16) Adjust your speed, pressure or both until you can deliver the 7.3 fl. oz. in 25 sq. ft.

Taking the time to calibrate your spray equipment will deliver better weed control. If the dose is too light, poor weed control will result. If too heavy, you are wasting material and are risking plant injury due to an overdose.

For assistance with calculations or calibration of equipment, contact your OHP representative, university extension agent, or search online resources for "how to calibrate your sprayer."

# 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



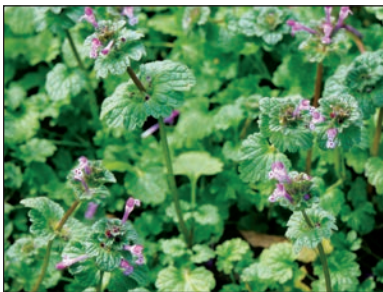
Groundsel, common



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	Marengo® SC	Marengo® G
CLASS	Diphenylether + Dinitroaniline	Benzonitrile	Alkylazines	Alkylazines
<b>WEED</b>				
American black nightshade			✓	✓
Annual Bluegrass/ poa	✓	✓	✓	✓
Barnyardgrass, common	✓		✓	✓
Bearded Sprangetop	✓			
Bermudagrass				
Bidens Aristosa				
Bittercress (Cardamine)	✓		✓	✓
Black Medic			✓	✓
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			✓	✓
Crabgrass, large/hairy			✓	✓
Crabgrass, smooth			✓	✓
Creeping Dayflower				
Cudweed, linear-leaf/purple	✓	✓	✓	✓
Cudweed, purple				
Cutleaf, Evening Primrose			✓	✓
Dallasgrass				
Dandelion, common	✓	✓	✓	✓
Deadnettle, Red		✓		

TRADE NAME	Biathlon®	Casoron® 4G	Marengo® SC	Marengo® G
CLASS	Diphenylether + Dinitroaniline	Benzonitrile	Alkylazines	Alkylazines
<b>WEED</b>				
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	✓	✓	✓	✓
Goosefoot		✓		
Goosegrass	✓		✓	✓
Groundsel, common	✓	✓	✓	✓
Guineagrass			✓	✓
Hairy fleabane	✓		✓	✓
Hairy nightshade			✓	✓
Henbit		✓	✓	✓
Horsetail		✓		
Jungle Rice				
Kikuyu Grass	✓			
Kochia			✓	✓
Knotweed		✓		
Kyllinga, annual sedge			✓	✓
Lambsquarters, common		✓	✓	✓
Lamium Amplexicaule				
Lawn Burweed			✓	✓
Little Mallow			✓	✓
Liverwort				
London Rocket			✓	✓
Longstalked Phyllanthus			✓	✓
Marestail	✓	✓	✓	✓

TRADE NAME	Biathlon®	Casoron® 4G	Marengo® SC	Marengo® G
CLASS	Diphenylether + Dinitroaniline	Benzonitrile	Alkylazines	Alkylazines
<b>WEED</b>				
Maypops		✓		
Miner Lettuce		✓		
Mouse Barley			✓	✓
Mulberry Weed			✓	✓
Mustard, black			✓	✓
Mustard, wild			✓	✓
Natalgrass		✓		
Nursedge, purple		✓	suppress	suppress
Nutsedge, yellow		✓	suppress	suppress
Orchardgrass		✓		
Oxalis, yellow woodsorrel	✓	✓	✓	✓
Parthenium			✓	✓
Pearlwort	✓			
Penn Smartweed		✓		
Pepperweed, VA	✓	✓		
Pigweed, prostrate	✓		✓	✓
Pigweed, redroot	✓	✓	✓	✓
Pineapple Weed		✓		
Plantain, buckhorn		✓	✓	✓
Plantain, paleseed			✓	✓
Prostrate Knotweed		✓	✓	✓
Prostrate Spurge	✓		✓	✓
Puncture Vine			✓	✓
Purslane, common		✓	✓	✓
Queen Anne Lace (Wild Carrot)		✓	✓	✓
Quackgrass		✓		
Ragweed, common		✓	✓	✓
Red Brome			✓	✓
Red Deadnettle		✓		
Redmaids			✓	✓
Rice Flatsedge			✓	✓
Russian Knap Weed		✓		
Russian Thistle		✓		
Ryegrass			✓	✓
Sandbur			✓	✓
Sedge, annual (Kyllinga)			✓	✓
Sesbania, hemp		✓	✓	✓
Shepherd's purse	✓	✓	✓	✓
Sicklepod				
Sida, prickly/teaweed		✓	✓	✓
Smooth Brome		✓		

TRADE NAME	Biathlon®	Casoron® 4G	Marengo® SC	Marengo® G
CLASS	Diphenylether + Dinitroaniline	Benzonitrile	Alkylazines	Alkylazines
<b>WEED</b>				
Southern Brassbuttons			✓	✓
Sowthistle, annual	✓		✓	✓
Spanish Needles		✓		
Sprangletop, Amazon	✓			
Spurge, garden	✓			
Spurge, leafy		✓		
Spurge, nodding				
Spurge, prostrate	✓		✓	✓
Spurge, spotted	✓		✓	✓
Sunflower, common			✓	✓
Swinecress			✓	✓
Tassel flower			✓	✓
Texas Panicum		✓		
Thistle, bull		✓		
Thistle, Russian		✓		
Timothy		✓		
Tropic Ageratum			✓	✓
Tufted lovegrass			✓	✓
Velvetleaf			✓	✓
Vetch			✓	✓
Virginia Pepperweed				
Wild Artichoke		✓		
Wild Aster		✓		
Wild Barley		✓		
Wild Mustard		✓		
Wild Onion				
Wild Radish		✓		
Willowherb, northern			✓	✓
Yellow Rocket		✓		

# OHP Weed Solutions®

WEED PROBLEM	CROP	OHP SOLUTION

## OHP QUICK REFERENCE

### Herbicide Product Rate Guide

Products	Rate per acre	Rate per 1 gallon
<b>Biathlon®</b>	100 lbs.	NA
<b>Casoron® 4G</b>	150 lbs.	NA
<b>Marengo® G</b>	150 to 200 lbs.	NA
<b>Marengo® SC</b>	7.5 to 15.5 fl. oz.	1 tsp.

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

TBS = tablespoon    tsp = teaspoon    mL = milliliter    1 fl oz = 29.6 mL

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