



# Common Herbicides in the Green Industry

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# Herbicide Details

- Trade names and active ingredients
- Formulations
- Susceptible plants
- Non-susceptible plants
- Mode of Action/Site of Action
- Application rate
- Combinations
- Noteworthy label instructions





# The Top 5 Herbicides

## Glyphosate

Broad-spectrum, post-emergent, group 9

## Snapshot<sup>®</sup>

Selective, pre-emergent, groups 29 and 3

## 2,4-D

Selective, post-emergent, group 4

## Flumioxazin

Broad-spectrum, pre-emergent, group 14

## Glufosinate

Broad-spectrum, post-emergent, group 10



1.

# Glyphosate



# Glyphosate



- Trade names: Roundup™ (DISCONTINUED), Agrisel® GlyPhoSel Pro 41%, Rodeo®
- Formulations: liquid application
- Susceptible plants: most emerged broadleaves and grasses, both desired plants and weeds
- Non-susceptible plants: established clover, yellow nutsedge
- Weed resistance: Palmer amaranth, marehail, common ragweed, waterhemp, six-weeks fescue, giant ragweed, annual ryegrass
- Mode of Action/Site of Action: Group 9
- Application rates: 0.5 to 2% solution, 4 to 7% solution; 0.5 to 5 qt/acre, 0.75 to 3 qt/ac
- Directed applications to weeds NOT present in turfgrass OR broadcast applications to prepare sites PRIOR to planting desired species
- Combinations: synergistic 2,4-D applications, pre-emergents, other modes/sites of action, some herbicides already have more than one active ingredient (e.g., Agrisel® GlyPhoSel Plus)



Spray Solution						
Desired Volume	Amount of This Product					
	1/2%	1%	1 1/2%	2%	5%	10%
1 Gal	2/3 oz.	1 1/3 oz.	2 oz.	2 2/3 oz.	6 1/2 oz.	13 oz.
25 Gal	1 pt.	1 qt.	1 1/2 qt.	2 qt.	5 qt.	10 qt.
100 Gal	2 qt.	1 gal	1 1/2 gal	2 gal	5 gal	10 gal

2 tablespoons = 1 fluid ounce

2.

Snapshot<sup>®</sup>



# Snapshot®



- Active ingredients: trifluralin (group 3), isoxaben (group 29)
- Formulations: granular application
- Susceptible plants: seedbanks of many broadleaves and grasses
- Non-susceptible plants: established plants
- Application rates: 100 to 200 lb/ac depending upon weed species
- Broadcast applications to bare ground (mulch included) around established desired plants  
NOT present in turfgrass
- Combinations: post-emergents, other modes/sites of action



3.

2,4-D





# 2,4-D



- Trade names: Weedone® LV4 EC, Hi-Dop® Broadleaf Herbicide, Weedar® 64
- Formulations: liquid application
- Susceptible plants: most emerged broadleaf plants
- Non-susceptible plants: grasses
- Mode of Action/Site of Action: Group 4
- Application rates: 2 to 3 pt/ac
- Broadcast applications to emerged broadleaf weeds in desired, established turfgrass
- Combinations: synergistic glyphosate applications, pre-emergents, other modes/sites of action, some herbicides already have more than one active ingredient

**Rate Conversion Table for Spot Treatment:**

Label Broadcast Rate (pints per acre)							
1/2	2/3	3/4	1	2	3	4	8
Equivalent Amount of Weedar 64 per 1000 sq ft							
1/5 fl oz* (5.5 ml)	1/4 fl oz (7.3 ml)	1/3 fl oz (8.3 ml)	3/8 fl oz (11 ml)	3/4 fl oz (22 ml)	1 fl oz (33 ml)	1-1/2 fl oz (44 ml)	3 fl oz (88 ml)

\* Conversion factors: 1 pt - 16 fl oz; 1 fl oz = 29.6 (30) ml

4.

Flumioxazin



# Flumioxazin



- Trade names: BroadStar® Herbicide, SureGuard® SC Herbicide
- Formulations: granular and liquid application
- Susceptible plants: seedbanks of many broadleaves and grasses, butterfly bush, summersweet clethra, slender deutzia 'Nikko,' winterberry holly, hydrangea, nandina 'Firepower,' cape plumbago, Japanese spirea, southern wax myrtle
- Non-susceptible plants: established plants
- Mode of Action/Site of Action: Group 14
- Application rates: 150 lb/ac, 8 to 12 fl oz/ac
- Broadcast applications to bare ground around desired, established broadleaf plants NOT present in turfgrass
- Broadcast applications of liquid formulations to desired foliage can cause spotting, granular applications left in foliar contact for extended periods of time can also cause spotting
- Combinations: post-emergents, other modes/sites of action, some herbicides already have more than one active ingredient (e.g., Fuerte™ also contains prodiamine, group 3)



5.

Glufosinate



# Glufosinate



- Trade names: Finale® XL T&O herbicide, Cheetah® Pro
- Formulations: liquid application
- Susceptible plants: most emerged broadleaves and grasses, both desired plants and weeds, white clover
- Non-susceptible plants: yellow nutsedge
- Mode of Action/Site of Action: Group 10
- Application rates: 3.2 fl oz/gal of spray
- Directed applications to emerged weeds NOT present in turfgrass OR broadcast applications to prepare sites PRIOR to planting desired species
- Alternative to glyphosate or mode/site of action rotation with glyphosate applications
- Combinations: pre-emergents, other modes/sites of action, some herbicides already have more than one active ingredient



Weed Size and Stage	Rate of this product (Per Gallon of Water)	Rate of this product (Per 1,000 sq. ft.)	Rate of this product Per Acre)	Spot Spray % Solution
Easily Controlled Weeds < 3 in height*	0.5 fl. oz. (0.009 lb. ai)	0.5 fl. oz. (0.009 lb. ai)	24 fl. oz./A (0.44 lb. ai)	0.5
Weeds < 3 in height	1.0 fl. oz. (0.018 lb. ai)	1.0 fl. oz. (0.018 lb. ai)	48 fl. oz./A (0.88 lb. ai)	0.5-0.75
Weeds < 6 in height pre- tiller grasses	1.25 fl. oz. (0.023 lb. ai)	1.25 fl. oz. (0.023 lb. ai)	56 fl. oz./A (1.0 lb. ai)	0.75-1.25
Weeds > 6 in height and/or grasses that have tilled	1.25 to 2.0 fl. oz. (0.023 to 0.036 lb. ai)	1.25 to 2.0 fl. oz. (0.023 to 0.036 lb. ai)	56 to 82 fl. oz./A (1.0 to 1.5 lb. ai)	1.25-1.5

\*See Weeds Controlled Table below for details.



# Honorable Mentions



## **SEDGEHAMMER®**

Halosulfuron, group 2,  
post-emergent nutsedge  
control

## **Pendimethalin**

Group 3, Pendulum® 2G,  
pre-emergent annual grass  
control (certain  
broadleaves)

## **Dimethenamid-p**

Group 15, Tower®, pre-  
emergent annual grass  
control (certain  
broadleaves)

## **Clopyralid**

Group 4, Lontrel®, post-  
emergent broadleaf  
control

## **Fortress®**

Isoxaben (group 29),  
dithiopyr (group 3), pre-  
emergent broadleaf and  
grass control

## **Plateau®**

Imazapic, group 2, post-  
emergent and pre-  
emergent broadleaf and  
grass control



## Combination Highlight

Tower<sup>®</sup> 6EC and Dimension<sup>®</sup> 2EW



# Contacts for Herbicide Information

- State Extension Specialist
- Manufacturer Sales Representatives
- Labels





# References

- [Plateau<sup>®</sup> label](#)
- [Tower<sup>®</sup> label](#)
- [Fortress<sup>®</sup> label](#)
- [Pendulum<sup>®</sup> 2G label](#)
- [FreeHand<sup>®</sup> 1.75G label](#)
- [Lontrel<sup>®</sup> label](#)
- [SEEDGEHAMMER<sup>®</sup> label](#)
- [Cheetah<sup>®</sup> Pro label](#)
- [Finale<sup>®</sup> XL T&O herbicide label](#)
- [SureGuard<sup>®</sup> SC Herbicide label](#)
- [BroadStar<sup>®</sup> Herbicide label](#)
- [Weedar<sup>®</sup> 64 label](#)
- [Hi-Dep<sup>®</sup> Broadleaf Herbicide label](#)
- [Weedone<sup>®</sup> LV4 EC label](#)
- [Snapshot<sup>®</sup> 2.5TG label](#)
- [History & Map of Herbicide-Resistant Weeds in Michigan by Michigan State University](#)
- [Agrisel<sup>®</sup> GlyPhoSel Pro 41% label](#)
- [Rodeo<sup>®</sup> label](#)
- [Weed Science Society of America Herbicide Site of Action Classification List](#)



Questions?

