

Herbicide Reference Guide For Small Acreage Landowners

The purpose of this guide is to provide information helpful in deciding which herbicide may be most appropriate for a small acreage landowner. There is no intended endorsement of the products listed, nor is discrimination intended towards any product that may have been omitted. This guide is not intended to substitute for a product label. **Always read the label and keep in mind “the label is the law”**. The user of any pesticide is liable for all aspects of handling the product, including but not limited to mixing, loading, application, spill control, and disposal of a pesticide or its container.

It is a violation of federal law to use any pesticide in a manner inconsistent with its labeling, with the following 4 exemptions:

- Application at a rate or frequency less than specified on the label.
- Application on a target species not specified on the label as long as application is to the site or use specified on the label, unless the label specifically prohibits use on that specific pest.
- Employing any method of application not prohibited on the label.
- Mixing with a fertilizer, as long as such a mixture is not prohibited on the labeling.

Acronyms and Definitions

Adjuvants – Additives to an herbicide tank mix to enhance plant uptake.

- AMS - ammonium sulfate
- COC – crop oil concentrate
- MSO – methylated seed oil
- NIS – nonionic surfactant
- UAN – urea-ammonium nitrate

GUP – General Use Pesticide. Are products which are available to the general public. **All herbicides listed in this guide are general use unless otherwise specified.**

MSDS – Material Safety Data Sheet. A technical bulletin that supplements information found on the product label. This bulletin provides detailed descriptions of a product’s physical properties and toxicity, and provides users and emergency personnel with the proper procedures for handling and working with that substance. Info can be obtained online at: www.cdms.net

Pesticide Label – a legal document located on the pesticide container that provides information concerning the safe and effective use of the pesticide. It is a violation of federal pesticide laws to use any pesticide in a manner inconsistent with its labeling.

PPE – Personal Protective Equipment (gloves, apron, eye protection, etc.). The required PPE for a specific compound is listed under the “Hazards to Humans” section on the label. Always use protective equipment specified on the label. The most serious risk of exposure from chemicals is during handling and mixing operations with the concentrated product.

Re-entry interval - period of time immediately after a pesticide application when agricultural employees may not enter a pesticide treated area without protective clothing.


RUP – Restricted Use Pesticide. The "Restricted Use" classification restricts the purchase of a product, and its uses, to a certificated pesticide applicator, or usage to anyone under the direct supervision of a certified applicator.

Landowners wishing to purchase and apply restricted use pesticides can obtain a Private Applicator’s License through the Colorado Department of Agriculture. Information is available at 303-239-4186 or at:

<https://www.colorado.gov/apps/cda/pesticide/applicator/exam/welcome.jsf>

Signal Words – Indicate the toxicity and/or hazards associated with the use of the pesticide. Pre-mix herbicides will always have the highest toxicity level of the mixed active ingredients.

- **Caution** – least toxic, Category 3 or 4. 1 ounce to 1 pint swallowed lethal to an adult.
- **Warning** – Category 2. 1 –3 teaspoons swallowed lethal to an adult.

- **Danger/Poison** – 

most toxic, Category 1. 1-3 drops swallowed lethal to an adult.

Toxicity – measured by LD₅₀ (lethal dose, 50%), describes the dose of a pesticide that will kill ½ of a group of test animals from a single dose. A pesticide with a lower LD₅₀ is more toxic than one with a higher number because it takes less of the pesticide to kill half of the test animals.

To obtain more comprehensive information regarding Colorado and Federal pesticide laws and regulation, and an overview of the CSU Pesticide Safety Education Program, see:

www.colostate.edu/Depts/SoilCrop/extension/CEPEP

Herbicide Index

BRAND NAME	ACTIVE INGREDIENT	REMARKS	PAGE #
Ally	Metsulfuron Methyl		52
Amine 4	2,4-D	Aquatic	57
Arsenal	Imazapyr		51
Banvel	Dicamba		46
Brash	Dicamba + 2,4-D		46,57
Chaparral	Aminopyralid + Metsulfuron Methyl		43,52
Chopper	Imazapyr + adjuvants		51
Cimarron	Metsulfuron Methyl		52
Cimarron Max	Metsulfuron Methyl + 2,4-D + dicamba		52,57,46
Cimarron X-tra	Metsulfuron Methyl + chlorsulfuron		52,44
Clarity	Dicamba		46
Clearstand	Imazapyr + Metsulfuron Methyl		51,52
Cody	Clopyralid + 2,4-D		45,57
Confront	Clopyralid + triclopyr		45,56
Crossbow	Triclopyr + 2,4-D		56,57
Curtail	Clopyralid + 2,4-D		45,57
Distinct	Diflufenzopyr + dicamba		47
Ecomazapyr 2	Imazapyr	Aquatic	51
Element 3A	Triclopyr	Aquatic	56
Element 4	Triclopyr		56
Escort	Metsulfuron Methyl		52
Fallowmaster	Dicamba + glyphosate		46,49
Forefront	Aminopyralid + 2,4-D		43,57
Formula 40	2,4-D		57
Garlon 3A	Triclopyr	Aquatic	56
Garlon 4	Triclopyr		56
Glean	Chlorsulfuron		44
Grazon	Picloram + 2,4-D	Restricted	53,57
Habitat	Imazapyr	Aquatic	51
Hardball	2,4-D		57
Hi-Dep	2,4-D		57
Journey	Imazapic + glyphosate		50,49
Landmaster	Glyphosate + 2,4-D		49,57
Matrix	Rimsulfuron		55
Milestone	Aminopyralid		43
Oasis	Imazapic + 2,4-D		50,57
Outlaw	Dicamba + 2,4-D		46,57
Outpost	Picloram	Restricted	53
Overdrive	Diflufenzopyr + dicamba		47
Panoramic	Imazapic		50

<u>BRAND NAME</u>	<u>ACTIVE INGREDIENT</u>	<u>REMARKS</u>	<u>PAGE #</u>
Pathfinder II	Triclopyr + adjuvants		56
Pathway	Picloram + 2,4-D	Restricted	53,57
Plateau	Imazapic		50
Powerline	Imazapyr		51
Prescott	Triclopyr + Clopyralid		56,45
Pro 60 EG	Metsulfuron Methyl		52
Rangestar	Dicamba + 2,4-D		46,57
Redeem	Clopyralid + triclopyr		45,56
Resolve	Rimsulfuron		55
Rifle	Dicamba		46
Rodeo	Glyphosate	Aquatic	49
Roundup	Glyphosate		49
Sahara	Imazapyr + diuron	Restricted	51
Starane	Fluroxypyr		48
Sterling	Dicamba		46
Telar	Chlorsulfuron		44
Topsite	Imazapyr + diuron	Restricted	51
Tordon	Picloram	Restricted	53
Transline	Clopyralid		45
Vanquish	Dicamba		46
Veteran 720	Dicamba + 2,4-D		46,57
Vista	Fluroxypyr		48
Weedar	2,4-D		57
Weed B Gon	Triclopyr		56
Weedmaster	Dicamba + 2,4-D		46,57
Weedone	2,4-D		57

PLEASE CHECK WITH YOUR DISTRIBUTOR FOR THE COSTS OF HERBICIDES.

Aminopyralid

Brand Name:

Milestone

Pre-mixes:

Chaparral with Metsulfuron Methyl

Forefront with 2,4-D

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	2 hours	12 hours	0	0

Labeled uses (sites):

- Rangeland, permanent grass pastures, non-cropland sites such as right-of-ways, campgrounds, trailheads, and trailsides.

Environmental characteristics :

- Can be applied to water's edge; do not apply directly to water.
- Active on target plants through foliar and root uptake.
- Not for use on irrigation ditchbanks.

Primary target species :

- Canada thistle, biennial thistles, knapweeds, common mullein, common teasel, oxeye daisy, sunflowers, cinquefoil, absinth wormwood, hawkweeds. (Plants of composite, legume, and polygonum families).
- Not effective for controlling grass species, kochia, bindweed, leafy spurge, toadflax, houndstongue, or most mustard species.
- **Based on results of university field trials, Milestone is the most frequently recommended product for control of Canada thistle and biennial thistles in range and pasture.**

Chlorsulfuron

Brand Name:

Telar, Glean

Pre-mixes:

Cimarron X-tra with metsulfuron

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	4 hours	4 hours	0*	0*

Labeled uses (sites):

- Range & Pasture.
- Non-crop and industrial sites.

Environmental characteristics:

- Can be applied to water's edge; do not apply directly to water.
- Chlorsulfuron has soil residual activity and is active on weeds through foliar and root uptake.
- The use of a nonionic surfactant, at a minimum rate of .25% volume/volume, is essential for this product to be effective.
- Chlorsulfuron is a dry formulation that requires vigorous agitation to go into solution. For sprayer tanks that do not provide agitation it is best to fill halfway with water, create slurry (mix enough water and granules to agitate until granules are totally dissolved) of the measured herbicide, then add to tank to ensure the product goes into solution.

Primary target species:

- Plants of the mustard family, biennial thistles, houndstongue, common mullein, common teasel, puncturevine, and Canada thistle. Good activity on dalmatian and yellow toadflax.
- Not effective for controlling most grass species, kochia, knapweed species, or bindweed.
- **University trials have shown Telar, applied at 2.0 oz product/acre with methylated seed oil, to provide very effective control of dalmatian toadflax.**

*Restriction dependant on rate of application

Clopyralid

Brand Name:

Transline, Lontrel, Stinger

Pre-mixes:

Curtail, Cody with 2,4-D

Redeem, Confront, Prescott with triclopyr

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	2 hours	12 hours	0	0

Labeled uses (sites):

- **Transline** - Rangeland, grass pastures, forest land, and rights-of-way.
- **Stinger** – Cropland use.
- **Lontrel** – turf and landscaping.

Environmental characteristics:

- Water soluble, should not be applied near water.
- Transline is similar to Tordon, though less persistent in the soil.
- Transline can be safely applied near trees and shrubs.
- Active on target plants primarily through foliar uptake, with root uptake to a lesser degree.

Primary target species :

- Canada thistle, biennial thistles, knapweeds, common teasel, oxeye daisy, sunflowers.
- Not effective for controlling grass species, kochia, bindweed, leafy spurge, toadflax, houndstongue, or most mustard species.
- **Safe to use over seedling grasses to control Canada thistle and other listed weed species on re-vegetation sites.**

Dicamba

Brand Name:

Banvel, Clarity, Sterling, Vanquish

Pre-mixes:

*Brash, Outlaw, Rangestar, Veteran 720, Weedmaster with 2,4-D
Fallowmaster with glyphosate*

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	4 hours	24 hours	37-70*	0

Labeled uses (sites):

- **Banvel, Clarity, Sterling** – For use in crops, pasture, and rangeland.
- **Vanquish** – non-cropland – turf, right-of-ways including areas that run through rangeland, and fence rows.

Environmental characteristics:

- Water soluble, should not be applied near water.
- Active on target plants primarily through foliar uptake, with root uptake to a lesser degree.
- Do not apply near desirable trees and shrubs.
- Dicamba is a volatile product that can damage off-target vegetation through vapor drift. Do not use when temperatures are expected to exceed 85 degrees Fahrenheit within 24 hours of application.

Primary target species :

- Kochia and many other annual broadleaf species. At higher rates can be used for suppression of Canada thistle, bindweed, and biennial thistles.
- Not effective for controlling grass species.
- **Dicamba is the most frequently recommended product used to selectively control kochia in established grassland.**

*Restriction dependant on rate of application

Diflufenzopyr + Dicamba

Brand Name:

Overdrive, Distinct – premixes with dicamba
(Diflufenzopyr is not sold alone, available in a premix only)

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	4 hours	12 hours	0	0

Labeled uses (sites):

- Overdrive - range & pasture, industrial rights-of-way
- Distinct – corn and fallow

Environmental characteristics:

- Primarily absorbed through foliar applications, soil uptake to a lesser degree.
- Use of surfactant recommended – nonionic or crop oil concentrate

Primary target species:

- Kochia and many other annual broadleaf species. At higher rates can be used for suppression of Canada thistle, bindweed, and biennial thistles.
- Not effective for controlling grass species.
- Overdrive is most often used in range and pasture to complement the activity of other herbicides such as clopyralid, picloram, quinclorac and tryclopyr.
- **University field trial results show Overdrive + Paramount tankmix is one of the most effective treatments for control of leafy spurge in pasture (Range & Pasture label for Paramount pending 2010).**

Fluroxypyr

Brand Name:

Vista, Starane

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Warning	1 hour	12 hours	7	0

Labeled uses (sites):

- **Vista** – non-cropland areas such as non-irrigation ditch banks, rights-of-way, industrial sites including grazed areas within sites.
- **Starane** – small grains, corn, fallow.

Environmental characteristics:

- Active on target plants through foliar uptake, no soil residual activity.
- Not for use on irrigation ditchbanks.

Primary target species :

- Kochia, prickly lettuce, puncturevine, sunflower.
- Not effective for controlling grass species, Canada thistle, or bindweed.
- **Safe to use over newly seeded grasses to control kochia and other listed weed species on re-vegetation sites.**

Glyphosate

Brand Name:

Roundup, current brand names too numerous to list

Pre-mixes:

Too numerous to list.

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	1-4 hours*	4 hours	NA	NA
Labeled uses (sites): <ul style="list-style-type: none">• Crop, non-crop, fallow.				
Environmental characteristics <ul style="list-style-type: none">• **non-selective herbicide (active on grasses and broadleaf plants) that controls most annuals and perennials.• Active through foliar uptake, has no soil activity.• Labeled for use up to water's edge. At least one formulation, Rodeo, labeled for use in and around water.				
Primary target species: <ul style="list-style-type: none">• Effective for control of most grasses and broadleaf species.				

*Check product label.

** Not approved for the Weed District cost-share program.

Imazapic

Brand Name:

Plateau, Panoramic

Pre-mixes:

Journey with glyphosate

Oasis with 2,4-D

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	1 hour	12 hours	7	0

Labeled uses (sites):

- Pasture, rangeland, rights-of-way.

Environmental characteristics :

- Imazapic has soil residual activity, and is taken up in plants through foliage and roots.
- This product has runoff potential and should not be used on hillsides sloping towards water.
- Do not apply to water, or inside irrigation ditches.
- Application timing, use rate and choice of surfactant can be critical, read the label carefully.
- **High rates can be injurious to cool season grasses such as smooth brome.**

Primary target species:

- Leafy spurge, cheatgrass, mustard species, dalmatian toadflax, bindweed, teasel, houndstongue, Russian knapweed, suppression of thistle species at higher rates.
- Not effective on kochia or diffuse and spotted knapweed.
- **Imazapic is the most commonly used herbicide for selective control of cheatgrass in newly seeded and established grass.**

*Plateau is not sold through retailers, but is available through the Weed District.

Panoramic has no sales restrictions.

Imazapyr

Brand Names:

Arsenal, Habitat

Pre-mixes:

Sahara, Topsite with diuron.

Chopper – ready to use pre-mix with adjuvants for cut-stump or basal bark treatments.

Clearstand with metsulfuron methyl

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	1 hour	NA	NA	NA

Labeled uses (sites):

- **Arsenal** – grass pasture, rangeland, non-crop areas such as industrial sites, right-of-ways, and fence rows.
- **Habitat** – for control of undesirable emergent and floating aquatic vegetation in and around standing and flowing water. Applications may be made to control undesirable wetland, riparian, and terrestrial vegetation growing in and around surface water.

Environmental characteristics :

- Non-selective herbicide (controls grasses and broadleaf plants).
- Persistent in soil, breaks down rapidly in water, uptake in plants through foliage and roots.
- Arsenal can be applied up to water's edge. Habitat has an aquatic label – can be used in and around water. Not for use on irrigation ditch banks.

Primary target species:

- Often used for total vegetative control (parking lots, industrial sites, etc.).
- **Imazapyr is very effective for control of tamarisk, Russian olive and other woody species by foliar application or cut-stump treatments.**

Metsulfuron methyl

Brand Name:

Ally, Cimarron, Escort

Pre-mixes:

Cimarron Max with dicamba and 2,4-D
Cimarron X-tra with chlorsulfuron (Telar)
Chaparral with aminopyralid

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	4 hours	4 hours	0-3*	0-3*

Labeled uses (sites):

- **Ally** – wheat, barley, and fallow.
- **Cimarron** – pasture and range.
- **Escort** – right-of-ways, industrial sites, and non-crop areas.

Environmental characteristics:

- Can be applied to water's edge; do not apply directly to water.
- This product has short soil residual activity and is primarily taken into a plant by foliar uptake.
- The use of a nonionic surfactant, at a minimum rate of .25% vol/vol, is essential for this product to be effective.
- Metsulfuron methyl is a dry formulation that requires vigorous agitation to go into solution. For sprayer tanks that do not provide agitation it is best to fill halfway with water, create slurry (mix enough water and granules to agitate until granules are totally dissolved) of the measured herbicide, then add to tank to ensure the product goes into solution.

Primary target species :

- **Plants of the mustard family – provides excellent control of hoary cress, perennial pepperweed, blue mustard, flixweed, and tumble mustard.**
- Effective for control of houndstongue, common mullein, common teasel, and assorted annual broadleaf species.
- Not effective for controlling grass species, kochia, knapweed species, or most perennials.

*Restriction dependant on rate of application

Picloram – *Restricted Use Product

Brand Name:

Tordon

Pre-mixes:

Grazon, Pathway with 2,4-D

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	2 hours	12 hours	14	0

Labeled uses (sites):

- Grass pastures, fallow cropland, and non-cropland areas.

Environmental characteristics:

- This product is soluble in water and persistent in soil.
- Do not apply on ditchbanks or bottoms, near water, or under desirable trees and shrubs.
- Tordon is residually active in the soil, and taken into a plant through foliar absorption and/or root uptake.

Primary target species:

- Field bindweed, Canada thistle, biennial thistles, knapweeds, toadflax, leafy spurge, houndstongue, woody species.
- Not effective for controlling kochia or most mustard species.
- Not effective for grass control, though will suppress certain established pasture grasses such as smooth brome.

* Restricted Use Products for retail sale to and use only by Certified Applicators or persons under their direct supervision. See criteria in the preceding 'definitions' section

Quinclorac

Brand Names:

Paramount, Facet, Drive

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	6 hrs	12 hours	NA	NA

Labeled uses (sites):

- Paramount - Fallow lands and non-crop. Range & Pasture label pending for 2010.
- Facet – Rice.
- Drive – Turf grass.

Environmental characteristics:

- Can be applied to water's edge. Do not apply directly to water or in areas where surface water is present.
- Quinclorac is active on target plants through foliar and root uptake.
- Add methylated seed oil to tank mix at rate of 1 quart/acre
- Do not apply more than 16 oz/acre per calendar year.

Primary target species:

- Leafy spurge, field bindweed, annual grasses such as barnyardgrass, crabgrass, and green and yellow foxtail.
- **University field trial results show Overdrive + Paramount tankmix is one of the most effective treatments for control of leafy spurge in pasture (Range & Pasture label pending for 2010).**

Rimsulfuron

Brand Name:

Matrix

Resolve

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution	4 hours	4 hours	NA	NA

Labeled uses (sites):

- Agronomic crops such as corn, potatoes, tomatoes, fruit crops.
- Non crop use - May be used to control certain invasive species, such as cheatgrass, in areas undergoing restoration or re-vegetation.
- **No Range & Pasture label – no livestock grazing or haying for one year following application on rangeland or pasture.**

Environmental characteristics:

- Rimsulfuron is primarily active through foliar uptake, little or no soil residual activity for weed control.
- The use of a nonionic surfactant, at a minimum rate of .25% volume/volume, is essential for this product to be effective.
- Rimsulfuron is a dry formulation that requires vigorous agitation to go into solution. For sprayer tanks that do not provide agitation it is best to fill halfway with water, create slurry (mix enough water and granules to agitate until granules are totally dissolved) of the measured herbicide, then add to tank to ensure the product goes into solution.

Primary target species:

- Annual grasses such as cheatgrass, puncturevine and plants of the mustard family.
- Rimsulfuron may be injurious to certain cool season perennial grasses such as western wheatgrass.

Triclopyr

Brand Name:

Garlon 4, Garlon 3A, Weed B Gon,

Pre-mixes:

Redeem, Prescott with Clopyralid

Crossbow with 2,4-D.

Pathfinder II – ready to use pre-mix with adjuvants necessary for effective cut-stump or basal bark treatments.

Many other pre-mix products are available.

Signal word (toxicity)	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Caution – Danger*	12 hours	14	0

Labeled uses (sites):

- **Garlon 4** – for use in forests and grazed areas.
- **Garlon 3A** – aquatic use (in and around water), non-cropland, right-of-ways, grazed areas.
- **Weed B Gon** – turf and ornamental applications.

Environmental characteristics :

- Ester formulation can be volatile, and is best used when temperature is not expected to exceed 85 degrees.
- Triclopyr has some soil activity but is primarily taken up by plants through foliage and/or vascular tissue (cut-stump or basal bark treatment).
- Restrictions near water vary with formulation – Garlon 4 – up to water’s edge. Garlon 3A has an aquatic label, can be used to control target vegetation in standing water.
- Not for use on irrigation ditch banks.

Primary target species:

- Used for controlling broadleaf weeds and woody vegetation. Has little or no effect on grasses.
- **Used as a cut-stump or basal bark treatment for control of Russian olives, tamarisk, and other woody species.**

*Signal word varies with differing triclopyr formulations

2,4-D

Brand Names:

Amine 4, Formula 40, Hi-Dep, Weedar, Weedone, Hardball, and many others too numerous to list.

Pre-mixes:

Too numerous to list.

Signal word (toxicity)	Rainfast period	Re-entry interval	Hay harvest (days)	Grazing interval (days)
Danger – Caution*	1 hour	48 hours	30	0

Labeled uses (sites):

- For use over a wide range of applications including rangeland, pasture, crops, and non-cropland.

Environmental characteristics :

- 2,4-D is the active ingredient in many compounds, and is available in ester and amine formulations.
- Ester formulations are volatile and may injure non-target plants through vapor drift. Low volatility (LV) esters are less susceptible to vapor drift, but may still volatilize at temperatures above 85 degrees. Amine formulations typically do not volatilize, and should be used during warmer weather.
- Ester formulations penetrate foliage more readily, and are usually used at lower rates than amine formulations.
- 2,4-D has little to no soil activity, uptake in plants is through foliage.

Primary target species:

- Used for control of most broadleaf weeds with little or no effect on grass. Higher rates for control or suppression of perennials.
- Not effective for control of kochia or knapweed species.

*Signal word varies with differing 2,4-D formulations

Sprayer Calibration

It is critical to know the output of a sprayer in order to be accurate in adding an herbicide to the tank.

Handgun

1. Measure a calibration plot that is exactly 18.5 ft X 18.5 ft (128th of an acre).
2. Spray the plot uniformly with water, keeping the sprayer pressure constant. Note the number of seconds required.
3. Spray into a bucket for the same number of seconds, again keeping the sprayer pressure constant.
4. Measure the number of ounces of water in the bucket.
5. Number of ounces of water measured from the bucket is equal to the number of gallons per acre (GPA) the sprayer is delivering.

Spray volume (GPA)	Amount of Herbicide to Add to Each Gallon of Water				
	Recommended Herbicide Rate/Acre				
	1 Pint	1 Quart	2 Quarts	3 Quarts	4 Quarts
15	1 fl oz	2 fl oz	4 fl oz	6 ¼ fl oz	8 ½ fl oz
20	0.83 fl oz	1.67 fl oz	3 ¼ fl oz	4 ¾ fl oz	6 1/3 fl oz
30	0.5 fl oz	1 fl oz	2 fl oz	3 ¼ fl oz	4 ¼ fl oz
40	0.42 fl oz	0.83 fl oz	1 2/3 fl oz	2 1/3 fl oz	3 ¼ fl oz
50	0.33 fl oz	0.63 fl oz	1 ¼ fl oz	2 fl oz	2 ½ fl oz
60	0.28 fl oz	0.55 fl oz	1.1 fl oz	1 2/3 fl oz	2 fl oz
70	0.22 fl oz	0.44 fl oz	0.88 fl oz	1 1/3 fl oz	1 ¾ fl oz
80	*1 ¼ tsp	2 1/3 tsp	4 ¾ tsp	7 ¼ tsp	9 ½ tsp
90	1 tsp	2 tsp	4 ¼ tsp	6 1/3 tsp	8 ½ tsp

6 tsp = 1.0 oz

Boom or Boomless Sprayer Calibration

Volume Method

1. On level ground, fill sprayer tank to a known level with water and drift agent (if using).
2. Turn on sprayer till all nozzles have output, shut off and refill tank to desired level.
3. Measure off $\frac{1}{4}$ of an acre, marking the start and end with a flag.

Width of Boom Swath in Feet	Linear feet to Cover $\frac{1}{4}$ acres
2	5445
4	2723
6	1815
8	1362
10	1090
20	545
30	363

4. Drive the measured $\frac{1}{4}$ acre with the speed that you will be using to spray, turning on the sprayer at the starting mark and off at the ending flag.
5. Return to the level ground that you filled the sprayer at and carefully measure the amount of water it takes to refill to the known level from step 1.
6. Multiply the amount from above step by 4. This is GPA (Gallons per Acre).

Stationary Method

1. On level ground, fill sprayer tank with water and drift agent (if using).
2. Turn on sprayer and measure spray pattern width in feet.
3. Collect liquid from each nozzle for 1 minute. Measure in ounces.
4. Divide ounces by 128 to determine GPM (Gallons per minute).
5. Determine speed that you will be using during spraying. MPH
6. With the below formula calculate GPA (gallons per acre).

$$\text{GPA} = \frac{\text{GPM} \times 495}{\text{MPH} \times \text{swath width (feet)}}$$

Notes