



# Vegetation Management & Aquatics

**ADJUVANT GUIDE**





## Make your applications work better

An adjuvant is a material added to a tank-mix to aid or modify the action of a pesticide or the physical characteristics of the mixture. Adjuvants are critical for improved performance, effectiveness, and consistency of pesticides. Our line of adjuvants help keep consistent spray patterns and droplet size to ensure on target spray without skips and off target plant injury due to drift.

Surfactants are the most commonly used adjuvant group where their primary role is to reduce surface tension, improve wetting/spreading/ and dispersing characteristics of the spray solution onto the foliage. Select from a range of surfactants designed to work with various chemistries as well as onto and into different plant surfaces.



## W.A.L.E.S mixing list

### **W** - Water and Water Conditioners –

1. Fill tank at least half full and start agitation. Add conditioner, pH buffer and/or antifoam.
2. Water Soluble Bags/Packets (WSB/WSP) – allow bags to fully dissolve before next step.
3. Wettable Powders (WP) or Dry Flowables (DF)
4. Water Dispersible Granules (WDG)

**A** - **Agitate** – the mixture and continue agitating while spraying. Make sure the products have mixed fully before adding the next product.

**L** - **Liquids** – Add Liquid (L) Flowables, Suspension Concentrates (S) or Suspo-Emulsions (SE). Fill tank with more water at this point.

**E** - **Emulsifiable Concentrates** – Add Emulsifiable Concentrates (EC) or Microemulsion Concentrates (MEC) and completely fill tank with water.

**S** - **Surfactants** – Add surfactants and other adjuvants, such as Droplex® (10oz/A) and Droplex® Xtra (24oz/A).

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The Right Adjuvant. The Right Solution.



HERBICIDE	Active Ingredient	Mode of Action Groups	HERITAGE ADJUVANT - VM	HERITAGE ADJUVANT - AQUATICS
2,4-D LV6	2,4-D	4	Gulfstream® Free	Aqua King Plus®
ACCORD®	Glyphosate	9	Breeze® XL	N/A
AQUATHOL® K	Dipotassium salt of endosulf	Not Classified	Gulfstream® Free	Aqua King Plus®
ARSENAL®	Imazapyr	2	Aqua King Plus®	Turbulence®
CAPTAIN® XTR	Copper Ethanolamine Complex	Not Classified	Aqua King Plus®	Aqua King Plus®
CLEARCAST®	Imazamox	2	Aqua King Plus®	Turbulence®
CLIPPER®	flumioxazin	14	N/A	Aqua King Plus®
COASTAL™	Simazine + Prodiamine + Imazaquin	5 + 3 + 2	Gulfstream® Free	N/A
CROSSBOW®	Triclopyr + 2,4-D	4	Turbulence®	N/A
CUTRINE-PLUS®	Copper Ethanolamine Complex	Not Classified	Aqua King Plus®	Aqua King Plus®
DICAMBA HD	Dicamba	4	Gulfstream® Free	N/A
GALLEON®	Penoxsulam	2	Aqua King Plus®	Aqua King Plus®
GARLON® 3A	Triclopyr	4	Gulfstream® Free	N/A
GARLON® 4	Triclopyr	5	Turbulence®	EP Base Oil
HABITAT®	Imazapyr	2	N/A	Turbulence®
HYVAR®	Bromacil	5	Droplex®	N/A
IMAGE®	Imazaquin	2	Gulfstream® Free	N/A
IMAZURON®	Imazapyr + Diuron	2 + 7	Gulfstream® Free	N/A
KOMEEN	Copper Ethylenediamine Complex	Not Classified	Aqua King Plus®	Aqua King Plus®
KROVAR®	Bromacil + Diuron	5 + 7	Turbulence®	N/A
LANDMASTER®	Glyphosate + 2,4-d	9 + 4	Gulfstream® Free	N/A
MILESTONE®	Aminopyralid	4	Gulfstream® Free	Aqua King Plus®
NATIQUE®	Copper Ethylenediamine Complex + Copper Triethanolamine Complex	Not Classified	Aqua King Plus®	Aqua King Plus®
NATIVEKLEAN™	2,4-D + Aminopyralid	4	Gulfstream® Free	N/A
OPENSIGHT®	Aminopyralid + Metsulfuron methyl	4 + 2	Turbulence®	N/A
OUTRIDER®	Sulfosulfuron	2	Gulfstream® Free	N/A
OVERDRIVE®	Diflufenopyr + Dicamba	19 + 4	Gulfstream® Free	N/A

## Heritage PPG Adjuvant Rate Guide (per 100 gallons)

Aqua King Plus® 16 - 64 fl oz

Turbulence® 48 - 96 fl oz

Breeze® XL use 2-28 fl oz for water pH adjustments or 2-10 quarts for water hardness adjustments

Droplex® 10 fl oz

Gulfstream® Free 16 - 32 fl oz

ALWAYS READ AND FOLLOW LABEL DIRECTIONS because factors outside of Heritage Professional Products Group controls such as weather, soil, planting and product application in individual results to be obtained including but not limited to financial performance, profits, losses and yields cannot be predicted or guaranteed by Heritage Professional Products Group. Aircover®, Breeze®, Droplex®, Gulfstream® and Turbulence® are trademarks of Heritage Landscape Supply Group. ©2024 Heritage Landscape Supply Group.



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PATHFINDER®	Triclopyr	4	Droplex®	N/A
PATHWAY®	Picloram + 2,4-D	4	Turbulence®	N/A
PATRON®	2,4-D + Dichlorprop-p	4	Gulfstream® Free	N/A
PLATEAU®	Imazapic	2	Gulfstream® Free	Turbulence®
POLARIS®	Imazapyr	2	Aqua King Plus®	Turbulence®
PRODEUCE®	Glyphosate + Prodiamine	9 + 3	Gulfstream® Free	N/A
PROSEGE® 2	Halosulfuron Methyl	2	Gulfstream® Free	N/A
RANGER PRO®	GLYPHOSATE	9	Gulfstream® Free	Aqua King Plus®
REMEDY® ULTRA	Triclopyr	4	Gulfstream® Free	N/A
RENOVATE®	Triclopyr	4	Gulfstream® Free	Aqua King Plus®
REVOLVER®	Foramsulfuron	2	Gulfstream® Free	N/A
ROUNDUP® QUIKPRO	Glyphosate	9	Droplex®	N/A
ROUNDUP® QUIKPRO TOTAL SC	Indaziflam + Glyphosate	29 + 9	Gulfstream® Free	N/A
SECLEAR®	Copper Sulfate Pentahydrate	Not Classified	Gulfstream® Free	Aqua King Plus®
SETHOXYDIM	Sethoxydim	1	Gulfstream® Free	Aqua King Plus®
STALKER®	Imazapyr	2	Turbulence®	Turbulence®
STINGRAY®	Carfentrazone	14	N/A	Aqua King Plus®
STRIKE 3®	2,4-D + MCPP + Dicamba	4	Gulfstream® Free	N/A
SUREGUARD®	flumioxazin	14	Gulfstream® Free	Aqua King Plus®
TARGET® 6 PLUS	MSMA	17	Droplex®	N/A
TELAR®	Chlorsulfuron	2	Gulfstream® Free	N/A
TORDON® 22K	Picloram	4	Gulfstream® Free	N/A
TOWER®	Dimethanamid	15	Droplex®	N/A
TRADEWIND®	Bispyribac-Sodium	2	Droplex®	N/A
TRANSLINE®	Clopyralid	4	Gulfstream® Free	N/A
TRIBUNE®	Diquat dibromide	22	N/A	Turbulence®
TUPERSAN®	Siduron	7	Turbulence®	N/A
VELOCITY®	Bispyribac-Sodium	2	Droplex®	N/A
VELPAR®	Hexazinone	5	Droplex®	N/A
VIEWPOINT®	Imazapyr+Aminocyclopyrachlor + Metsulfuron	2	Turbulence®	N/A
VISTA®	Fluroxypyr	4	Gulfstream® Free	N/A



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## Mystic® Colorants

Our line of dyes and colorants help keep consistent spray patterns to ensure on target spray without skips or aesthetically pleasing ponds and water features with industry preferred greens, blues and blacks. Select from a variety of products designed to work in markets from golf to vegetation management

LAKE DYES	Description	Rates
MYSTIC® LAKE DYE BLACK	Black pigment for enhancing aesthetics of lakes, ponds and other water bodies	4-16 FL OZ/ 1 ACRE FOOT
MYSTIC® HC/L	Blue pigment for enhancing aesthetics of lakes, ponds and other water bodies	4-16 FL OZ/ 1 ACRE FOOT
MYSTIC® LAKE BLACK WSP	Black dye in quick dissolve toss-pack transforms off-color water	1 PACK PER ACRE 2-4 FT DEEP
MYSTIC® LAKE BLUE WSP	Blue dye, toss-pack transforms off-color water and can also be used as a spray pattern indicator	AQUATIC: 1 PACK PER ACRE 1-2 FT DEEP, OTHER USES: 1-2 PACKS PER 100 GALLON

SPRAY PATTERN INDICATOR	Description	Rates
MYSTIC® BLUE	Non-staining, liquid blue spray pattern indicator	6-32 FL OZ/ 100 GALLONS
MYSTIC® GREEN	Non-staining, liquid green spray pattern indicator	6-32 FL OZ/ 100 GALLONS
MYSTIC® HC/L	Blue high concentrate spray pattern indicator	6-25 FL OZ/ 100 GALLONS

## Utility Adjuvants

Utility adjuvants are application aids that are mixed in the tank solution to control foam, help remove stains and clean tanks, hide odors and more. The addition of FoamForce™ prior to adding products which are likely to cause foam build up will greatly reduce filling time. Use PostFlight after each application, or when changing chemistries to neutralize and clean spray tank, lines and nozzles.

UTILITY	Description	Rates
FOAMFORCE™	Preventative and curative antifoam agent	1-2 OZ/100 GALLONS
FPS™	Foam marker for spray application equipment	3 OZ/2 GALLONS
POSTFLIGHT®	Pigment/stain remover & spray tank cleaner and residue neutralizer	1 FL OZ/ EVERY 3 GALLONS
PREFLIGHT®	Wintergreen odor masking agent with some anti-foam properties	1-6 FL OZ/ 100 GALLONS





# Sprayer Calibration

3 key components verify sprayer is properly calibrated for use:

1. Speed (MPH)
2. Nozzle flow/output (GPM, GPA)
3. Agitation and Bypass

## 1. Speed Calibration (miles per hour formula)

Travel a known, flat distance (minimum 200 feet) and record the time to complete distance. Be sure to be at full/desired speed when starting distance/time measurement.

$$\text{MPH} = \frac{\text{Distance} \times 60}{\text{Time (seconds)} \times 88}$$

## 2. Sprayer output (GPM and GPA) Calibration

Set desired pressure (standard 40 psi for flat fan nozzles) and perform a catch test of a single nozzle. Record gallons (not ounces) collected in 60 second; this is GPM catch volume. Visually inspect and confirm all nozzles are performing appropriately. Use the following formula to determine spray output (gallons per acre):

$$\text{GPA} = \frac{\text{GPM} \times 5,940}{\text{MPH} \times W \text{ (distance between nozzles in inches)}}$$

This is the output of the sprayer using the desired/calculated speed from step 1. If desired spray rate (GPA) is not achieved, sprayer must be adjusted via changing speed (MPH), or nozzle catch volume (GPM) by altering pressure or changing nozzles.

Adjustment Example: GPA calculation was 71 GPA as follows:

$$\text{GPA} = \frac{0.75 \times 5,940}{3.5 \times 18} = 71 \text{ GPA}$$

Desired spray rate is 87 GPA. Speed can be reduced or pressure increased as outlined to achieve 87 GPA:

$$\text{GPA} = \frac{2.85 \times 5,940}{3.5 \times 18} = 87 \text{ GPA} \quad \text{or} \quad \text{GPA} = \frac{0.92 \times 5,940}{3.5 \times 18} = 87 \text{ GPA}$$

Speed reduced

Pressure increased to increase volume output

The following formula can be used to determine required catch volume (GPM) to reach desired spray rate (GPA) using desired speed from step 1.

$$\text{GPM} = \frac{\text{GPA (desired rate)} \times \text{MPH} \times W}{5,940} \quad \text{ex:} \quad \text{GPM} = \frac{87 \times 3.5 \times 18}{5,940} = 0.92 \text{ GPM (catch volume)}$$

## 3. Agitation and Bypass

Confirm nozzle output is consistent when using agitation or boom bypass. Note required change in pressure needed to maintain consistent output and adjust as needed during use.



## Recommendations to achieve a uniform pattern

Accurate application of the intended rate per acre is only the first part of proper calibration. Uniform application from nozzle to nozzle and at the boom tips (swath overlap) is equally important. The following recommendations are based on the results of on-site calibration of numerous custom application machines by Heritage agronomists.

### Check Nozzle Pattern Overlap

For custom application, 100% or double overlap of patterns is recommended as the minimum for most nozzles including flat fans. The reason for this recommendation is that under field conditions and with long booms it is difficult to maintain the minimum 30-50% nozzle pattern overlap generally recommended by most nozzle manufacturers.

### Check For Internal Plugging Of Nozzles

Most new nozzles have a preorifice that is considerably smaller than the final tip orifice. As a result, when plugging occurs, it is often in the preorifice. Unlike plugging of the final tip, partial plugging of the preorifice is rarely visible to the naked eye. As a result, nozzle output can be cut in excess of 50% without any obvious visible effect on the pattern. Preorifice or venturi nozzles must be removed on a regular basis in order to detect partial plugging. Likewise, nozzle screens also require regular inspection to detect plugging.

**NOTE:** Drift retardants that thicken the spray can drastically reduce the spray angle, particularly with venturi nozzle styles. Droplex® can be used with many nozzles without concern for reduced spray angle.

### Check Boom Pressure

Boom pressure can be considerably different from the in-cab pressure monitor. Periodically, check the pressure of each boom section with a pressure gauge (a quick connect fitting on the gauge is recommended).

## Calibration Information

### Abbreviations

MPH = Speed in Miles Per Hour

GPA = Gallons Per Acre

W = Spray Width Per Nozzle or nozzle spacing in Inches

GPM = Gallons Per Minute (per nozzle)

OPM = Ounces Per Minute

### Dry Measures

1 Pound - 16 Ounces

### Liquid Measures

1 Gallon = 128 Ounces

1 Quart = 32 Ounces

1 Pint = 16 Ounces

### Area Measure

Acre = 43,560 sq ft

### How Conversion Factor (5940) Is Developed

The constant 5940 is derived by converting GPA, MPH, and W into one unit (GPM) as follows:

$$\frac{\text{Gal}}{\text{Min}} = \frac{\text{Gal}}{\text{Acre}} \times \frac{\text{Miles}}{\text{Hour}} \times \frac{\text{W(in)}}{1} \times \frac{5280(\text{ft})}{\text{Mile}} \times \frac{\text{ft}}{12 \text{ in}} \times \frac{\text{Acre}}{43560 \text{ ft}} \times \frac{\text{Hour}}{60 \text{ min}} = \frac{5280}{1 \times 12 \times 43560 \times 60} = \frac{1}{5940}$$

## Calibrating Hand Sprayers

One quart of product/acre = 0.75 oz or 1.5 tbsp/gal (assumes 32 GPA). Apply to 1000 sq ft. Actual rate depends on spray pressure, walking speed, and tip size. To accurately determine the application rate, measure off and spray a 1000 sq ft area. On a volume/volume basis, 1% v/v = 1.3 fl oz/gal.

## Calibrating Nozzles

Nozzle tips come in many angle and output options. This information is stamped onto the individual nozzle tip as a number. For a flat fan nozzle, the number indicates the angle of spray and the output in gallons per minute.

### 8005

**The first two or three numbers are the spray angle of the tip.**

### 8005

**The last two numbers are the output of the nozzle in gallons per minute.**

EXAMPLE: 8005 - 80 degree angle with output is 0.5 gallon per minute  
11005 - 110 degree angle with output is 0.5 gallon per minute  
8015 - 80 degree angle with output is 1.5 gallon per minute

### How to determine the difference in output of old nozzles:

1. Ensure proper PSI is set.
2. Using water only, engage the spray flow for the boom.
3. Collect the water from a single nozzle in a large measuring container for 1 minute.
4. To find GPM, divide the total ounces collected in the container during 1 minute by 128 (number of ounces in 1 gallon).

EXAMPLE: The boom is fitted with 8005 tips. From the first tip, 88 ounces were collected in 1 min

$$\frac{88 \text{ oz. collected}}{128 \text{ oz per gallon}} = 0.6875 \text{ GPM actual}$$

5. Subtract the actual GPM from the GPM of the nozzle number to get the difference in GPM.

$$\begin{array}{r} 0.6875 \text{ actual GPM} \\ -0.50 \text{ nozzle set GPM} \\ \hline 0.1875 \text{ difference in GPM} \end{array}$$



