



= Indicates interactive item.

ADJUVANT USE GUIDE FOR TURF

DIGITAL INTERACTIVE EDITION

Herbicides

Herbicide	Adjuvant	Use Rate:
2,4-D		
Acclaim [®]	Transport Ultra™	1 - 2 quarts / 100 gallons
Barricade [®] 4L	Pen-A-Trate II™	2 pints / 100 gallons
Basagran [®] T&O	Speed™	12 ounces / 100 gallons
Battleship [®] III	Microyl™	10 - 12 ounces / acre
Bensumec™/Betasan [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Blade™	Duplex™	1 - 2 quarts / 100 gallons
Blindside [®]	Microyl	10 - 12 ounces / acre
Campaign [®]	Microyl	10 - 12 ounces / acre
Celsius™	Transport Ultra	1 - 2 quarts / 100 gallons
Certainty [®]	Pen-A-Trate II	2 pints / 100 gallons
Chipco Ronstar [®]	Microyl	10 - 12 ounces / acre
Confront [®]	Speed	12 ounces / 100 gallons
Cool Power	Transport Ultra	1 - 2 quarts / 100 gallons
Corsair™	Transport Ultra	1 - 2 quarts / 100 gallons
Crossbow [®]	Pen-A-Trate II	2 pints / 100 gallons
Defender™	Transport Ultra	1 - 2 quarts / 100 gallons
Dimension [®]	Pen-A-Trate II	2 pints / 100 gallons
Direx [®] 4L	Pen-A-Trate II	2 pints / 100 gallons
Dismiss [®]	Pen-A-Trate II (pre-plant only)	2 pints / 100 gallons
Dismiss [®] South	Not recommended	—
Drive [®]	Microyl	10 - 12 ounces / acre
Echelon [®]	Microyl	10 - 12 ounces / acre
Envoy™ Plus	Pen-A-Trate II	2 pints / 100 gallons
Escalade [®] 2	Pen-A-Trate II	2 pints / 100 gallons
Finale [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Fusilade [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Gallery [®]	Pen-A-Trate II	2 pints / 100 gallons
Garlon [®]	Pen-A-Trate II	2 pints / 100 gallons
Glyphosate	Pen-A-Trate II	2 pints / 100 gallons
Goal [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Harrier [®]	Microyl	10 - 12 ounces / acre
Illoxan [®]	Duplex	1 - 2 quarts / 100 gallons
Image [®]	Pen-A-Trate II	2 pints / 100 gallons
Karmex [®]	Microyl	10 - 12 ounces / acre
Katana [®]	Pen-A-Trate II (see label)	2 pints / 100 gallons
Kerb [®]	Pen-A-Trate II	2 pints / 100 gallons
Lontrel [®]	Speed	12 ounces / 100 gallons
Manor [®]	Delux™	3 - 5 quarts / 100 gallons
Mecomec [®] /MCPP acid	Pen-A-Trate II	2 pints / 100 gallons
Millennium Ultra 2 [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Monument™	Transport Ultra	1 - 2 quarts / 100 gallons
MSMA	Microyl	10 - 12 ounces / acre
Negate [®]	Delux	3 - 5 quarts / 100 gallons
Octane [®]	Microyl	10 - 12 ounces / acre
	Chem-Stik LpH™	16 - 48 ounces / 100 gallons

Herbicides continued

	Adjuvant	Use Rate:
Onetime [®]	Persist Ultra™	1.5 pints / acre
Patriot	Microyl	10 - 12 ounces / acre
Pendulum [®] Aquacap	Duplex	1 - 2 quarts / 100 gallons
Pennant Magnum [®]	Not recommended	—
Plateau [®]	Pen-A-Trate II	1 quart / 100 gallons
Power Zone [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Prograss [®] /Poa Constrictor	Not recommended	—
Prosedge/Sedgehammer	Microyl	10 - 12 ounces / acre
Pylex™	Microyl	10 - 12 ounces / acre
Q4™	Transport Ultra	1 - 2 quarts / 100 gallons
Quicksilver [®]	Pen-A-Trate II	2 pints / 100 gallons
Quincept™	Transport Ultra	1 - 2 quarts / 100 gallons
Remedy [®]	Pen-A-Trate II	2 pints / 100 gallons
Revolver [®]	Microyl	10 - 12 ounces / acre
Reward [®]	Delux	3 - 5 quarts / 100 gallons
TranXit GT [®]	Microyl	10 - 12 ounces / acre
Ronstar [®] Flo	Speed	12 ounces / 100 gallons
Scythe [®]	Pen-A-Trate II	2 pints / 100 gallons
Segment/Sethoxydim	Not recommended	—
Sencor [®]	Speed	12 ounces / 100 gallons
Simazine [®]	Speed	12 ounces / 100 gallons
Solitare [®]	Microyl	10 - 12 ounces / acre
Specticle [®]	Duplex	1 - 2 quarts / 100 gallons
Specticle™ Flo	Duplex	1 - 2 quarts / 100 gallons
Speed Zone [®]	Microyl	10 - 12 ounces / acre
Spoiler [®] /Triamine	Transport Ultra	1 - 2 quarts / 100 gallons
SquareOne [®]	Pen-A-Trate II	2 pints / 100 gallons
Sureguard [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Surflan [®]	Speed	12 ounces / 100 gallons
Surge [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Tenacity [®]	Pen-A-Trate II	2 pints / 100 gallons
Tower [®]	Not recommended	—
Tranxit	Microyl	3 - 4 pints / 100 gallons
Tribute Total™	Persist Ultra or Transport Ultra*	1.5 - 2 pints / acre or 1 - 2 quarts / 100 gallons
Trimec [®] /Triplet [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Tri-Power	Transport Ultra	1 - 2 quarts / 100 gallons
Tupersan [®]	Duplex	1 - 2 quarts / 100 gallons
Turflon [®]	Transport Ultra	1 - 2 quarts / 100 gallons
T-Zone™	Transport Ultra	1 - 2 quarts / 100 gallons
Vanquish [®] , Banvel [®]	Transport Ultra	1 - 2 quarts / 100 gallons
Velocity	Not recommended	—
Xonerate [®]	Transport Ultra or Pen-A-Trate II	1 - 2 quarts/100 gallons or 2 pints/100 gallons

*See herbicide label for adjuvant recommendation by weed controlled

Fungicides

	Adjuvant	Use Rate:
Affirm™	SYNC [®] or Duplex**	1 pint / 100 gallons
Aliette [®]	SYNC	1 pint / 100 gallons
Armada [®]	SYNC	1 pint / 100 gallons
Banner Maxx [®]	SYNC	1 pint / 100 gallons
Banol [®]	SYNC	12 ounces / 100 gallons
Bayleton [®]	SYNC	1 pint / 100 gallons
Briskway™	SYNC	1 pint / 100 gallons

Fungicides continued

Chipco® GT	Adjuvant	Use Rate:
chlorothalonil	SYNC	1 pint / 100 gallons
Cleary's 3336™	SYNC	1 pint / 100 gallons
Compass®	Chem-Stik	8 ounces / 100 gallons
Concert®	SYNC	1 pint / 100 gallons
Consyst®	SYNC	1 pint / 100 gallons
Curalan®	SYNC	1 pint / 100 gallons
Disarm™	SYNC	1 pint / 100 gallons
Dovetail™	SYNC	1 pint / 100 gallons
Eagle®	SYNC	1 pint / 100 gallons
Emerald®	SYNC	1 pint / 100 gallons
Enclave™	SYNC	1 pint / 100 gallons
Endorse®	Speed	12 ounces / 100 gallons
Fore®	Chem-Stik	8 ounces / 100 gallons
Headway™	SYNC	1 pint / 100 gallons
Heritage®	SYNC or Duplex**	1 pint / 100 gallons
Honor™	SYNC	1 pint / 100 gallons
Insignia®	SYNC	1 pint / 100 gallons
Instrata®	SYNC	1 pint / 100 gallons
Interface™	Not recommended	—
Junction®	New Balance™	refer to label
Kaligreen®	Chem-Stik	8 ounces / 100 gallons
Kestrel® & Kestrel MEX	SYNC	1 pint / 100 gallons
Kocide® 4.5 LF	Chem-Stik	8 ounces / 100 gallons
Medallion®	SYNC	1 pint / 100 gallons
Pegasus™	SYNC	1 pint / 100 gallons
Pentathion® LF	Chem-Stik	8 ounces / 100 gallons
Peregrine®	SYNC	1 pint / 100 gallons
Prostar®	Cascade Plus™ or Magnus™	4 ounces / 1000 sq. ft.
Raven®	SYNC	1 pint / 100 gallons
Renown™	SYNC	1 pint / 100 gallons
Reserve™	SYNC or Duplex**	1 pint / 100 gallons
Rubigan®	SYNC	1 pint / 100 gallons
Secure®	SYNC	1 pint / 100 gallons
Stellar™	SYNC	1 pint / 100 gallons
Subdue Maxx®	Duplex	1 - 2 quarts / 100 gallons
SysStar®	SYNC	1 pint / 100 gallons
Tartan®	SYNC	1 pint / 100 gallons
thiophanate-methyl	SYNC or Duplex**	1 pint / 100 gallons
Torque™	SYNC	1 pint / 100 gallons
Tourney®	SYNC	1 pint / 100 gallons
Trinity™	SYNC	1 pint / 100 gallons
Triton®	SYNC or Duplex**	1 pint / 100 gallons
TwoSome™	SYNC	1 pint / 100 gallons
Wingman™	Chem-Stik	8 ounces / 100 gallons
Zerotol®	Speed	8 - 16 ounces / 100 gallons
Zyban® WSB	Chem-Stik	8 ounces / 100 gallons

**For soil-active diseases use Duplex at 1 - 2 quarts per 100 gallons

Insecticides

	Adjuvant	Use Rate:
Acelepryn [®]	Speed	8 ounces / 100 gallons
Arena [®]	Speed	8 ounces / 100 gallons
Aloft [®]	Speed	8 ounces / 100 gallons
Allectus [®]	Speed or Chem-Stik	See rates below
Avid [®]	Speed or Chem-Stik	See rates below
Azadiractin	Not recommended	—
Conserve [®]	Speed or Chem-Stik	See rates below
Discus [®]	Chem-Stik	8 ounces / 100 gallons
DeltaGard [®]	Speed or Chem-Stik	See rates below
Dursban [®]	Speed or Chem-Stik	See rates below
Meridian [®]	Speed	8 ounces / 100 gallons
Merit [®] 75 WP	Speed or Chem-Stik	See rates below
M - Pede [®]	See pesticide label	—
Permethrin	See pesticide label	—
Provaunt [®]	Speed or Chem-Stik	See rates below

Use the following rates with Chem-Stik or Speed for delivering spray solution to the appropriate target areas:

- 8 ounces of Chem-Stik / 100 gallons for foliar feeding pests
- 8 ounces of Speed / 100 gallons for thatch or crown feeding pests
- 8 ounces of Speed / 100 gallons for sub-surface pests

Always read and follow label directions.

Plant Growth Regulators

	Adjuvant	Use Rate:
Cutless [®]	Duplex	1 - 2 quarts / 100 gallons
Primo Maxx [®]	Sync	1 pint / 100 gallons
Proxy [®]	Not needed	—
Trimmit [®]	Duplex	1 - 2 quarts / 100 gallons

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GUIDELINES TO ADJUSTING pH LEVELS

Adjusting / buffering the pH level of spray solutions can significantly increase the performance of certain pesticides by reducing alkaline hydrolysis which causes the accelerated breakdown of their active ingredients. Below is a guideline for determining the optimal pH.

Brand Name	Generic Product Name	Optimum pH	Needs Buffer	Half-Life at Various pH Levels				
				Alkaline		Neutral		Acidic
				9.0	8.0	7.0	6.0	5.0
FUNGICIDES								
BANNER MAXX [®]	PROPICONAZOLE		NO	Stable pH 5.0 - 9.0				
BANOL [®]	PROPAMOCARB		NO	Stable over wide pH range				
BAYLETON [®]	TRIADIMEFON	7	NO	Stable over wide pH range				
BENLATE	BENOMYL	5	YES		1 hr	7 hr	80 hr	
CAPTAN	CAPTAN	5.0 - 7.0	NO					
CHIPCO GT [™]	IPRODIONE	7	NO	Rapid hydrolysis at pH above 8.0				
CHIPCO [®] SIGNATURE [™]	FOSETYL-AL	6	NO	Stable at pH 4.0 to 8.0				
CLEARY 3336 [™]	THIOPHANATE-METHYL	6.0-7.0	YES	Buffer to a pH of 6.0 to 7.0 prior to addition of 3336				
COMPASS [™]	TRIFLOXYSTROBIN		NO	Stable over wide pH range				
DACONIL [®]	CHLOROTHALONIL	7	NO	Stable over wide pH range				
DITHANE WF	MANCOZEB	7	NO	Optimum pH range 5.5 - 6.0				
EAGLE WSP	MYCLOBUTANIL		NO	Stable over wide pH range				
EMERALD [®]	BOSCALID		NO	Stable over wide pH range				
ENDORSE [™]	POLYOXIN D & MANCOZEB		NO	Stable over wide pH range				
FORE SC RAINSHIELD	MANCOZEB	7	NO	Optimum pH range 5.5 - 6.0				
HERITAGE [™]	AZOXYSTROBIN		NO	Stable over wide pH range				
INSIGNIA [®]	PYRACLOSTROBIN		NO	Stable over wide pH range				
JUNCTION [®]	COPPER HYDROXIDE & MANCOZEB	5	YES	Optimum pH range 4.0-7.0				
KOCIDE	COPPER HYDROXIDE	6.5	NO					
PROSTAR [®]	FLUTOLANIL		NO	Stable pH 3.0 - 11.0				
RUBIGAN	FENARIMOL	7	NO	Decompose in acidic solutions				
SPECTRO [™] 90	CHLOROTHALONIL, THIOPHANATE-METHYL	6.0-7.0	YES	Buffer to a pH of 6.0 to 7.0 prior to addition of 3336				
SUBDUE MAXX [™]	METALAXYL	5.0-9.0	YES	Buffer to a pH of less than 7.5				
TERRAZOLE [®]	ETRIDIAZOLE		NO	Stable over wide pH range				
HERBICIDES								
ACCLAIM [®] EXTRA	FENOXAPROP-P-ETHYL		YES	Unstable in acidic conditions				
BALAN	BENEFIN		NO	Stable at pH 5.0-9.0				
BANVEL	DICAMBA	5.0-6.0	YES					
BARRICADE [®]	PRODIAMINE		NO	Stable over wide pH range				
BASAGRAN T&O [™]	BENTAZONE	8.0-9.0	NO	Resistant to hydrolysis				
CHIPCO [®] RONSTAR [™]	OXADIAZON		NO	Stable over wide pH range				
CONFRONT	TRCLOPYR, CLOPYRALID		NO	Stable over wide pH range				
CORSAIR [™]	CHLORSULFURON	>7.0	YES	Corsair is more stable in high pH. Avoid application in low pH.				
DIMENSION	DITHIOPYR		NO	Stable over wide pH range				
DRIVE [™]	DICHLORO QUINOLINECARBOXYLIC ACID		NO	Stable over wide pH range				
ENVOY [™]	CLETHODIM	5.5-6.5	YES	pH should be >5.0 and <7.0				
FINALE [®]	GLUFOSINATE-AMMONIUM	4.0-8.0	NO	Stable over wide pH range				
FUSILADE [®]	FLUAZIFOP-P-BUTYL	7	NO					
GALLERY	ISOXABEN		NO	Optimum pH Range 5.0-9.0				
GLYPHOSATE	GLYPHOSATE		NO	Stable over wide pH range				
ILLOXAN [®]	DICLOFOP-METHYL		NO	Stable over wide pH range				
IMAGE [™]	IMAZAQUIN	7	NO	Stable over pH range 5.0-9.0				
KERB	PRONAMIDE		NO	Stable over wide pH range				

GUIDELINES TO ADJUSTING pH LEVELS

CONTINUED

Brand Name	Generic Product Name	Optimum pH	Needs Buffer	Half-Life at Various pH Levels				
				Alkaline		Neutral		Acidic
				9.0	8.0	7.0	6.0	5.0
HERBICIDES (continued)								
LONTREL	CLOPYRALID		NO	Stable over wide pH range				
MANAGE [®]	HALOSULFUTON-METHYL	7	NO	Optimum pH range 5.0–7.0				
MANOR [®]	METSULFURON METHL METHL BENZOATE	>7.0	YES	May degrade in 24 hours in acid solutions				
MONUMENT [™]	TRIFLOXY SULFURON-SODIUM	7	YES	If pH is less than 5.5, add a buffer to raise pH to 7.0				
PENDULUM [®]	PENDIMETHALIN		NO	Stable over wide pH range				
PENNANT MAGNUM [®]	METOLACHLOR	6.0–7.5	NO	Stable over wide pH range				
REVOLVER [™]	FORAMSULFURON	7	YES	If pH is less than 6.0, add a buffer				
REWARD [®] DIQUAT			NO	Stable over wide pH range				
RONSTAR [®]	OXADIAZON	<7.0	YES	Stable in acid or neutral solutions				
INSECTICIDES								
ASTRO [®]	PERMETHRIN	5.5	YES	Optimal pH range 5.0–6.0				
AVID [®]	ABAMECTIN	6.5	NO	Stable pH range 5.0–9.0				
DELTAGARD [®]	DELTAMETHRIN		NO	Most stable at pH < 7.0				
DURSBAN	CHLORPYRIFOS	7	NO	1.5 days	35 days			
DYLOX [®]	TRICHLORFON	5	YES	63 min.	6.5 hours	3.7 days		
ENDEAVOR [™]	PYMETOZINE	>7.0	YES	Degrades at low pH				
MACH 2	HALOFENOZIDE		NO	Stable over wide pH range				
MALATHION	MALATHION	5	YES	5 hours	19 hours	3 days	8 days	
MERIT [®]	IMIDACLOPRID		NO	Stable over wide pH range				
ORTHENE [®]	ACEPHATE	7	NO	16 days	46 days	40 days		
SCIMITAR [®]	LAMBDA–CYHALOTHRIN	5.0–7.0	YES	Adjust pH to level between 5.0–7.0				
SEVIN [®]	CARBARYL	7	YES	24 hours	2.5 days	24 days	100 days	
TALSTAR [®]	BENFENTHRIN		NO	Stable over pH range 5.0–9.0				
TEMPO [®]	CYFLUTHRIN		NO	Stable over pH range 5.0–9.0				
PLANT GROWTH REGULATORS								
B-NINE [®]	DEMINOZIDE	<7	YES	Do not use with alkaline materials				
BONZI [®]	PACLOBUTRAZOL		NO	Stable pH 4.0–9.0				
CUTLESS	FLURPRIMIDOL		NO	Stable over wide pH range				
EMBARK	MEFLUIDIDE	6.5	NO					
PRIMO MAXX [™]	TRINEXAPAC-ETHYL	<7.0	YES	Best performance in acidic solutions				



PRODUCT REVIEWS



As a part of our commitment to develop products that are innovative, sensible and effective, we value your feedback.

If you use or have tried a product of ours, please take a moment to let us know your thoughts. We appreciate the opportunity to receive a comment or address a concern.

Just scan or click this code to give us a quick product review.

TOTAL SPRAY DROPLET MANAGEMENT

Plant protectants, growth regulators and foliar nutrients will not produce effective, long-term results if they do not hit their target. Border™ T&O is designed to increase product efficacy by improving droplet adhesion and coverage on the leaf surface while dramatically reducing off target movement. Improve your spray performance and return on product investment with Border T&O.

MAXIMIZE PERFORMANCE:

To experience the advantages of Border T&O, do the following:

- Fill the spray tank with 50% of the desired carrier volume
- Do not pre-mix Border T&O in a vessel or inductor
- Engage sprayer agitation
- Add all tank mix ingredients, except Border T&O, in the following order
 1. Compatibility agent and/or antifoam, if needed
 2. AMS, dry formulations (WP, DF, WDG, SP)
 3. Dry soluble and suspension fertilizers / micronutrients
 4. Flowable formulations (F & FL)
 5. Liquid concentrates, suspension and microencapsulated (LC, SC, ME)
 6. Emulsifiable concentrates (E, EL or EC)
 7. Solutions and soluble liquids (S or SL)
 8. Liquid micronutrients and fertilizers
 9. Water conditioners and other adjuvants
 10. Remove basket filter
 11. Add Border T&O
 12. Finish filling to desired spray volume level and continue agitation
- Remove sprayer basket filter
- Add Border T&O and finish filling to desired spray volume

Border T&O can be used in conjunction with other Precision spray tank adjuvants to improve the performance of tank mix partners and reduce off target movement.



[Click here to view Border T&O video.](#)

USE RATES:

- Spray Pressure less than 30 PSI – 2 pints of Border T&O per 100 gallons of spray solution
- Spray Pressure from 30 to 50 PSI – 3 pints of Border T&O per 100 gallons of spray solution
- Spray Pressure greater than 50 PSI – 4 pints of Border T&O per 100 gallons of spray solution

ADJUVANTS

-  **Chem-Stik™** - Nonionic Spreader Sticker
Highly concentrated and uniquely formulated for efficacy and easy handling and clean up. Excellent for contact fungicides and insecticides that require leaf surface retention.
-  **Cascade Plus™**, **Duplex™** and **Magnus™** - Soil Surfactants
Soil surfactants that can be used to move herbicides and fungicides through thatch and into the soil.
-  **Delux™** - Surfactant plus Ammonium Sulfate Adjuvant
A biodegradable activator surfactant and ammonium sulfate premix formulated to enhance the performance of certain post-emergence herbicides.
-  **Microyl™** - Activator Adjuvant
A unique nonionic paraffin based MSO replacement that provides superior performance and improved turfgrass safety at low-use rates.
-  **New Balance™** - pH Buffer and Nonionic Surfactant
A surfactant and buffer combination that effectively lowers spray solution pH and improves leaf surface coverage.
-  **Pen-A-Trate II™** - Premium Nonionic Surfactant
Formulated for use with conventional and new-generation low-use rate pesticides to ensure superior wetting and spreading for excellent weed control.
-  **Persist® Ultra** - Methylated Seed Oil
Formulated to optimize pesticide performance and mixing characteristics with a wider range of tank mix partners than ordinary methylated seed oils or crop oils.
-  **Speed™** - Nonionic Siloxane Surfactant
Utilizes Silquick™ wicking action to move spray solution up and down the plant for superior coverage of targeted pests.
-  **SYNC®** - Fungicide Activator
A unique, proprietary adjuvant technology proven to enhance the performance of both contact and systemic fungicides, and to lengthen disease control at reduced water volume on a wide variety of turf diseases.
-  **Transport Ultra™** - Water Conditioning NIS
Combination of nonionic surfactant, water conditioning agents and ammonium ions replaces the need for ammonium sulfate with weak acid herbicides such as glyphosate, dicamba and phenoxies.

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