

# ADJUVANTS FOR HERBICIDES

## **Surfactants**

The surfactant concentrations recommended in the guidelines are based on the use of surfactants that are 85% (+10%) active. All numbers have been rounded off to the nearest whole number in the following list of adjuvants currently registered. If a surfactant is used with a lower level of activity, proportionally more should be used to obtain the desired concentration. The surfactant market provides a variety of trade names with great differences in levels of active ingredients.

Because of the confusion that frequently occurs concerning the purchase of a suitable surfactant, the following suggestions are provided:

1. Purchase a surfactant specifically manufactured and marketed for use in agriculture; use only nonionic surfactants sold specifically for use with herbicides and cleared for use under Public Law 518.

2. Purchase on the basis of percentage active ingredient. It is less profitable, for example, to purchase a product with 20% active ingredient at \$4 per gallon than it is to purchase a product with 80% active ingredient at \$10 per gallon.

3. Do not consider isopropyl alcohol or water as active ingredients. Many products on the market are deceptive because they may include isopropyl alcohol (isopropanol) as a “functioning agent” or some other nondescript term to imply that the alcohol is an active ingredient. If the label on the container does not specifically state the percentage active ingredient (% surfactant) in the container, ask the dealer for this information.

4. Do not purchase products manufactured for household use to use with herbicides. Many of the surfactants present in household detergents and related products are excellent surfactants per se, but they may be present in low concentrations, in mixtures, or in combination with other products that interact with herbicides to reduce the level of weed control obtained.

5. Be wary of claims that a surfactant may cost much more but can be used at concentrations much lower than with conventional

surfactants. Evidence does not exist that there is any one particular surfactant being marketed that is so effective that the amount normally needed for adequate control can be greatly reduced as compared to other suitable surfactants that are available. Premium prices may be paid for surfactants marketed in this manner with a poor return on the investment.

6. In deciding on the most economical surfactant to purchase for use with herbicides, ignore the following claims: (1) the surfactant contains a silicone or some other agent that will help keep the spray equipment clean; (2) the surfactant increases water penetration into the soil; or (3) use of the surfactant will increase root penetration and nutrient uptake by the crop. Often these claims have not been verified. The use of such claims may imply that the product being offered will cost more than surfactants being offered by reputable agricultural outlets.

7. There are no “miracle” surfactants. There are many good surfactants on the market, but there are none that justify greatly increased prices. There are none that are so highly effective that the use rate can be reduced below that recommended for specific herbicides in these weed control guidelines.

8. Some companies recommend the use of certain adjuvants with their products. Consult labels for approved adjuvants.

## **Oil + Surfactants and/or Emulsifiers**

Several poorly defined terms characterize this group of adjuvant mixtures. The suggested addition of a crop oil concentrate (COC) refers to products that contain 80 to 85% petroleum or vegetable oil plus 15 to 20% surfactant and emulsifiers. Use of blends, other than emulsifiable oils, containing more than 85% oil has not been evaluated adequately for use with herbicides.

The term “emulsifiable oil” generally refers to products that contain about 98% oil and 1 to 2% emulsifiers. The terms “non-phytotoxic oils” and “phytobland oils” also have been used for this group of adjuvants. Generally, crop oil concentrates are being used in place of emulsifiable oils in herbicide spray mixtures.

## ACTIVITY CLASSIFICATION

*(as listed on the label)*

- |  |   |
|--|---|
| A. Nonionic surfactants  | N. Not specified                            |
| B. Activator adjuvant  | O. Emulsifier for use with crop oils        |
| C. Spreader-sticker  | P. Extender — Protects against weathering   |
| D. Drift control agent   | Q. Safener — Protects against phytotoxicity |
| E. Anti-foam agent   | R. Water Conditioner                        |
| F. Wetting agent   | S. Deposition agent                         |
| G. Compatibility agent   | T. Ammonium sulfate                         |
| H. Suspension agent  | U. Organosilicone surfactant                |
| I. Penetrating agent   |   |
| J. Vegetable oil base  |   |
| K. Petroleum oil base  |   |
| L. Buffering activity  |   |
| M. Some of the percent active includes isopropyl alcohol or other short-chain alcohols |   |

## Registered Adjuvants

Manufacturer	Brand name	% Active agent	Activity classification
Access Business Group	All-Purpose Spray Adjuvant	23.6	F
	APSA-80	80	A,B,C,F
AgTime	Visible Soil Penetrate & Enhancer Granular	20	I,P
	Visible Soil Penetrator & Enhancer Liquid	99.7	I,P
Agxplore International	Triple Play	100	A,B,S
	Tyrant	100	J
BASF	Dash HC	99	B,K
	Sun-It	100	B,J
Brewer International Inc.	Poly Control 2	30	C,D
	Rebound	92	A
	Red River 90	90	A,C,F
	Side-Kick II	100	B,C,F,I
	Sun Set	100	A,K
Check-Mark	Transmit	81.75	A,E
Drexel	AMS-Supreme	36.5	E,S,T
	AMS-Xtra	34.5	E,T
	Beanoil	100	B
	Holzit	100	E,R,S,T
	Hum-AC 820	80	A
	Lox	100	D,S
	Lox Plus	45.2	D,S
	Pas-800	80	A,I,L
	Peptoil	100	K
	Primary Spray Tank	100	K
	Sir-Factant	80	A
	Special 80	80	A
	Surf-AC 820	80	A
	Surf-AC 910	90	A
	Vegetoil	100	J,O
Garrco Products	Control	37	D,S
	Control WM	37	D,S
	Condition ND	100	R
	Improve	90	A
	Prevent	100	E
Goldschmidt Chemical	Break-Thru Nonionic Wetter/Spreader	100	A,C,F,I
PBI Gordon	Spreader-Sticker	80	C
Helena Chemical Co.	Accuquest WM	35	S,T
	Ad-Spray 80	80	A,C,F
	Ad-Spray 90	90	A,C,F
	Agri-Dex	99	A,K
	Align	35	A,R
	Blendex VHC	90	G
	Cide Winder	71	A
	COC	100	A,J
	Cohere	90	A,C
	Dyne-A-Pak	100	A,S
	DyneAmic	100	K,U
	DLZ	92	A,L,J,K
	First Up ST	15	B
	Foam Buster	20	E
	Foamer	50	E
	Ground Zero	100	D,S
	Grounded	99	S
Harvest Boost	39	S	

<b>Manufacturer</b>	<b>Brand name</b>	<b>% Active agent</b>	<b>Activity classification</b>
Helena Chemical Co. (continued)	Hel-Fire	90	B
	Induce	90	A,C,F
	Inlet	90	A,C,F
	Interactive	100	B,R
	Kammo Plus	100	G
	Kinetic	99	A,C,F,I
	Kinetic HV	99	A,C,F,I
	NXS	80	B
	Optima	90	A,L
	Penetrator Plus	97	A,I,L
	PointBlank	34	D,S
	Pro-Mate DLZ	92	I,J,L
	Quest	50	R,T
	Request	50	R,T
	SoyDex Plus	99	A,J,L
	Staput Plus	1	I,S
	Strikezone MXD	10	S
	Strike Zone PPS	100	R,S,T
	Jimmy Sanders, Inc.	AG-Edge	100
Complement		80	G
Contact		90	G,L
Con-trol		30	D,S
Equilizer		60	L,R,T
Gundown Max		16	E
Low Foam		80	A
Regiwett		100	U
Sil-Surf		99	A,U
SoySurf		90	B,C,I,J
SoySurf Plus		100	J,U
Soysurf MSO		100	A,J
Soysurf X-Tra		76	A,B,U
Surfoil		99	B,K
Surfoil Plus		97	A,I,L
Super-Fact		95	A,J
Super Max AMS		36	R,S,T
Super Surf 90		90	A,B
Lawn & Garden	Herbicide Helper	100	A,C,F,I
Loveland Products	Activator 90	90	A,E,I
	Actamaster	99	T
	Amigo	93	J
	Attach	100	A,C
	Bond	55	A,C,S
	Chem-Trol	1	D,S
	Choice	50	R
	Choice Weather Master	54	R
	Compadre	10	D,E,S
	E-X Mix	65	G
	Fighter-F	10	E
	Freeway	100	C,F,I,U
	Herbimax	99.32	A,K
	Intac Plus2	15	C,D,S,U
	LI-700	80	D,I,L,S
	Liberate	100	A
	Maximizer COC	100	A,B,K
	MSO Concentrate	100	A,J
	Phase	100	A,B
	Reign	1	E,S
	Support Liquid	30	H
	Tactic	62	C,F,S
	Target LC	63.4	D,S
	Timberland 90	90	A,E
	Timbersurf 90	90	A

Manufacturer	Brand name	% Active agent	Activity classification
Loveland Products (continued)	Valid	100	D,E,S
	Weather Gard	100	E,I,R,S
	Weather Gard Complete	100	D,E,I,R,S
Monsanto	Entry II	35	A
Precision Labs	Speed	99.9	U
Sewer Sciences	Corn Foam	78.5	E
Southern Ag. Insecticides	Herbi-Oil	100	A,K
Stoller Enterprises	Allmighty	100	E,R,S,T
	Natur'l Oil	93	A,J
Syngenta Crop Protection	Supercharge	100	K
Trace Chemicals	Foam-Eater Squeeze	10	E
VPG	HY Buffer/Blender	65	A,B,G,L
	HY Drift Control	1	D
	HY (Non-Ionic) 80/20 Spreader	80	A,B
	HY (Non-Ionic) 90/10 Spreader	90	A,B,C
	HY Prime AG Oil	100	B,C,F,I
	HY Spreader Sticker	100	C,I,S
	HY Synergizer	97	A,L,J
UAP	UAP Surfactant 80/20	80	A
Winfield Solutions	AD100	100	A,O
	Activate Plus	90	A
	AG-3018	52	E,L,R,T
	Alliance	50	R,T
	AMS Plus	50	B,T
	Ballast	20	L
	Class Act Next Generation	50.5	A,R
	Complete	60	G
	Complex	23.2	C
	Corral AMS	46.7	D,T
	Corral Poly	35.25	D,S
	Destiny	99.6	F,J
	Fast Break	17.35	E
	Heatwave	100	N
	HI-PER-OIL	98	A,K
	Interlock	100	D,I,S
	Level 7	51.55	C,L,R
	N-PAK AMS	34	R
	N-PAK 28	28	T
	Placement	100	D,S
	Placement ProPak	45.2	D,S,T
	Powerlock	95	A,D,E,I,S
	Preference	89.5	A,E
	Prime Oil	99.15	K
	Prime Oil EV	100	J
	Promark	38	N
	Rivet	100	J
	Silkin	99	U
	Superd HC	92	A,J
	Top Surf	80	A
Transfix	99.7	C	
Windcheck	1	D,S	