



ADJUVANT TECHNOLOGY FOR HERBICIDE APPLICATIONS

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What is an adjuvant?

- ✘ Any product in a herbicide formulation or added to the spray tank to modify herbicidal activity or spray characteristics.
- ✘ Terminology
 - + A surfactant is an adjuvant but an adjuvant is not necessarily a surfactant



Adjuvant Rules

- ✘ Always follow the label
 - + Do you need any adjuvant?
- ✘ Don't favor any specific adjuvant
- ✘ Price and efficacy are not related
- ✘ Know the pH of your water source
- ✘ Try new adjuvants on small areas first
- ✘ Dish soap is not an acceptable adjuvant



Adjuvant Terminology

- ✘ Non-ionic surfactant (NIS)
 - + Low toxicity, stable, can be formulated with many different adjuvant types
- ✘ Crop Oil, Crop Oil Concentrate (COC)
 - + Keep the leaf surface moist longer, allowing for more plant uptake
- ✘ Organo Silicone (OS)
 - + Usually a silicone based product combined with NIS
- ✘ Methylated Seed Oil (MSO)



Adjuvant Types

- ✘ Surfactants
- ✘ Stickers
- ✘ Penetrants
- ✘ Extenders
- ✘ Buffering or acidifying agents
- ✘ Drift Retardants
- ✘ Defoamers
- ✘ Compatibility Agents



Adjuvant Types

- ✘ Surfactants (wetter/spreader)
 - + Alter the surface tension of spray solution to allow droplets to spread out over the foliage

- ✘ Stickers
 - + Increases the ability of the spray to remain on the leaf surface spray



Adjuvant Types

✘ Penetrants

- + Increase the movement of the spray into the foliage
- + Help the herbicide penetrate the waxy layer on the outside of the leaf

✘ Extenders

- + Decrease the rate of pesticide degradation by UV rays or volatilization



Adjuvant Types

- ✘ Buffering or acidifying agents
 - + Alter the pH of the spray solution
 - + Some herbicides (such as glyphosate) do not perform as well when the spray solution pH is above 7

- ✘ Drift Retardants
 - + Help increase the droplet size of the spray solution to reduce off-target movement



Adjuvant Types

✘ Defoaming products

- + Often a silicone based product that reduces the foaming of the spray solution in the tank.
- + Only use the recommended rate, a little is a lot

✘ Compatibility agents

- + Aid in maintaining herbicides and carriers in solution
- + Often added to other products



Examples of Multiple Type NIS

Product	Surfactant	Sticker	Penetrant	pH Buffer	Drift Ret.	Defoamer
Activator	X		X			
Activator 90	X		X			X
Induce	X					X
Kinetic	X		X			
LI-700	X		X	X	X	X
Liberate	X		X		X	
X-77	X		X			



Examples of Multiple Type CO and COC

Product	Surfactant	Sticker	Penetrant	pH Buffer	Drift Ret.	Defoamer
AD 100	X		X			
Agri-Dex	X	X	X			
Agri-Oil	X		X			
COC	X	X	X			
Herbimax	X		X			
Maximizer	X	X	X			



Examples of Multiple Type OS

Product	Surfactant	Sticker	Penetrant	pH Buffer	Drift Ret.	Defoamer
Dyne-amic	X		X			
Freeway	X		X			
Phase	X					
Silken	X		X			
Stilwet	X					
Tactic	X	X				



Adjuvant Selection

- ✘ What does the label say?
- ✘ What type of weeds am I spraying
 - + Waxy and hairy leaves on weeds
- ✘ What are the weather conditions
 - + Dry weather = thicker waxy layer
- ✘ Do I need to minimize drift
- ✘ What is the pH/hardness of my water source
- ✘ Does the product foam under agitation



Which is the best?

- ✘ There is no miracle adjuvant
- ✘ It may be necessary to add two or more to a spray tank to achieve the best control
- ✘ Drift retardant is often overlooked
 - + Use in conjunction with drift reduction tips and lower pressure
- ✘ Defoamers should be used in small amounts



Can I have a favorite?

- ✘ A single favorite
 - + Only if you apply a single herbicide in a single use pattern

- ✘ Multiple favorites is ok
 - + As long as they meet the label requirements of the herbicides and use patterns

- ✘ I currently have 30 different adjuvants in my storage, with about a dozen in heavy use



Why do I do work with adjuvants

- ✘ Crop injury
 - + Adjuvants can cause injury to horticulture crops

- ✘ Efficacy
 - + Different adjuvants affect efficacy of herbicides.

- ✘ Drift control
 - + Drift reduction is important in all herbicide applications to reduce off-target injury



QUESTIONS?



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