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 volatization
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

<table>
<thead>
<tr>
<th>Product</th>
<th>Surfactant</th>
<th>Sticker</th>
<th>Penetrant</th>
<th>pH Buffer</th>
<th>Drift Ret.</th>
<th>Defoamer</th>
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## Examples of Multiple Type CO and COC

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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
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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