

# ADJUVANTS AND WEED CONTROL

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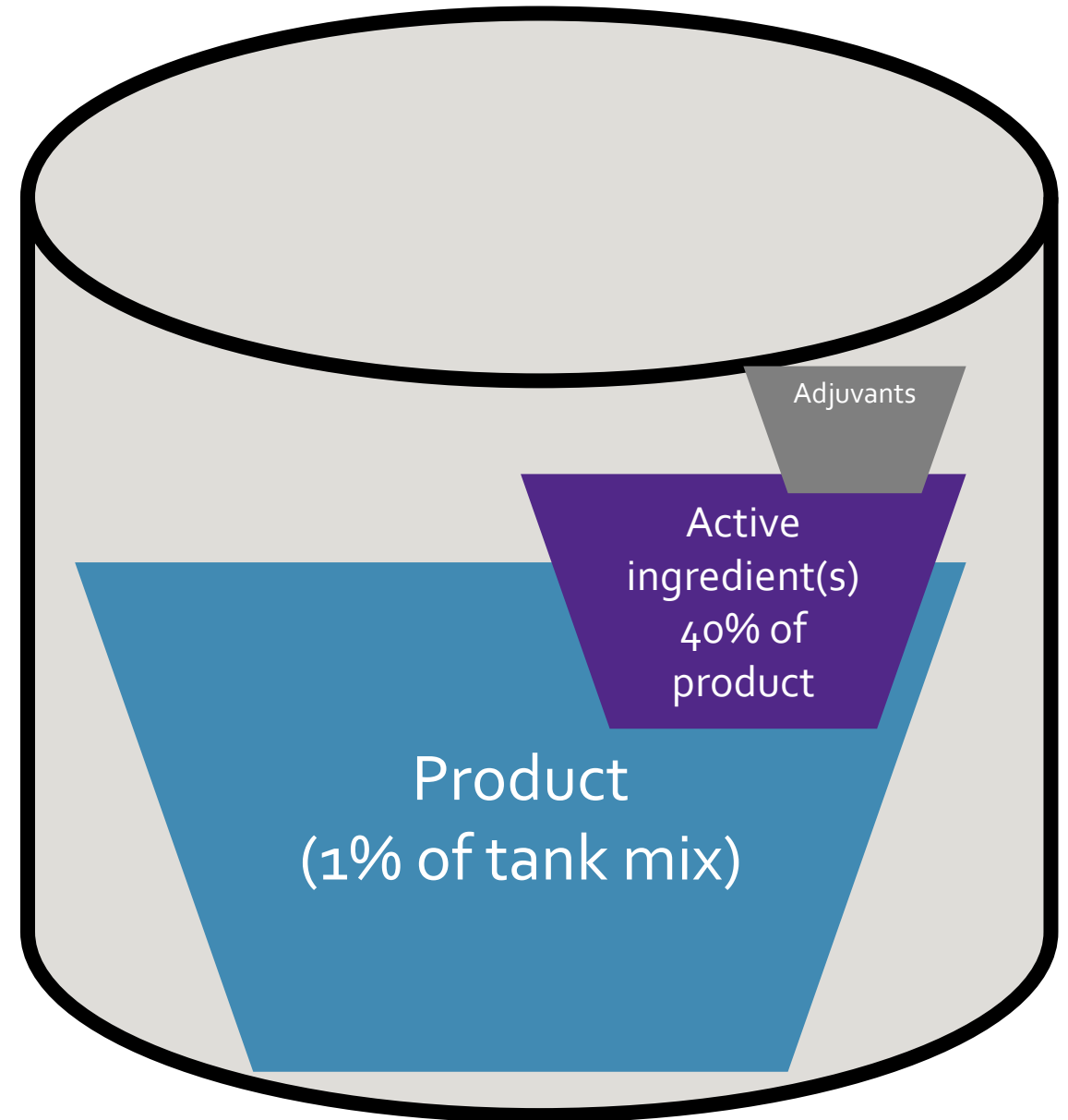
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# Adjuvant

- A substance added to the formulation or the spray tank in order to modify herbicide activity or application characteristics



# Adjuvants

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- A substance that is added to the formulation or the spray tank in order to modify herbicide activity or application characteristics
  - Utility
    - Do not affect weed control
    - Modify application characteristics
    - Example: Drift reduction agent, defoamer
  - Activator
    - Improve herbicide effectiveness
    - Modify spray characteristics
    - Example: Nonionic surfactant, crop oil concentrate

# Why adjuvants are needed

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- Spray droplets must stay on the leaf surface
- Leaf surfaces repel water
- Herbicides must be dissolved to be absorbed
- Many herbicides are weak acids – they change in response to pH

Adjuvants DO NOT  
have herbicidal activity  
when applied alone

# Factors affecting activator adjuvant selection

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- Herbicide chemistry
- Water chemistry
- Weed characteristics
- Concern for crop response
- Environment

# What is a quality adjuvant?

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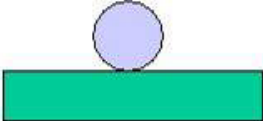

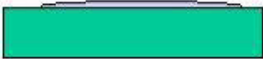

- Adjuvants do not require the same testing as herbicides
- Council of Producers and Distributors of Technology
  - Adjuvants and Inerts Committee formed 1993
- CPDA certified adjuvants
  - Meet functionality claims indicated on the label
  - Meet EPA regulations for food safety
  - Meet OSHA human health requirements
- CPDA.com



# Surfactants

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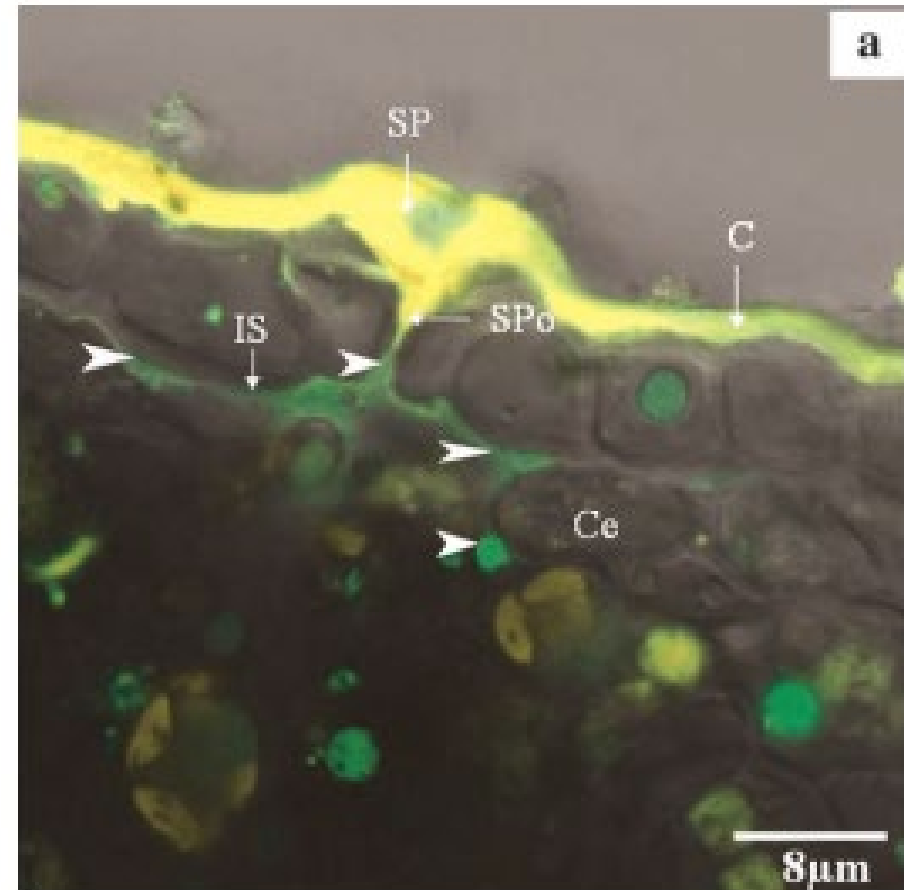
- Improve dispersal, spreading, wetting, or other properties of a liquid by modifying surface characteristics

	Surfactant concentration	Weed Control
	0%	45%
	0.12%	60%
	0.25%	85%
	0.50%	98%



# Oils

- Soften waxes in cuticle
- Potential for increased crop injury
- Little research on mechanisms of action

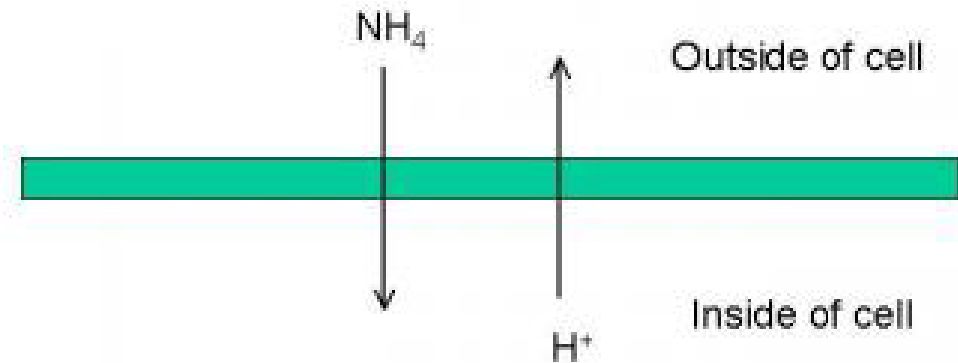


# AMS Alters pH

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- AMS decreases pH of leaf surface
- Weak acid herbicides more lipophilic at low pH

*Movement of hydrogen ions into the extracellular area reduces the pH outside the cell*

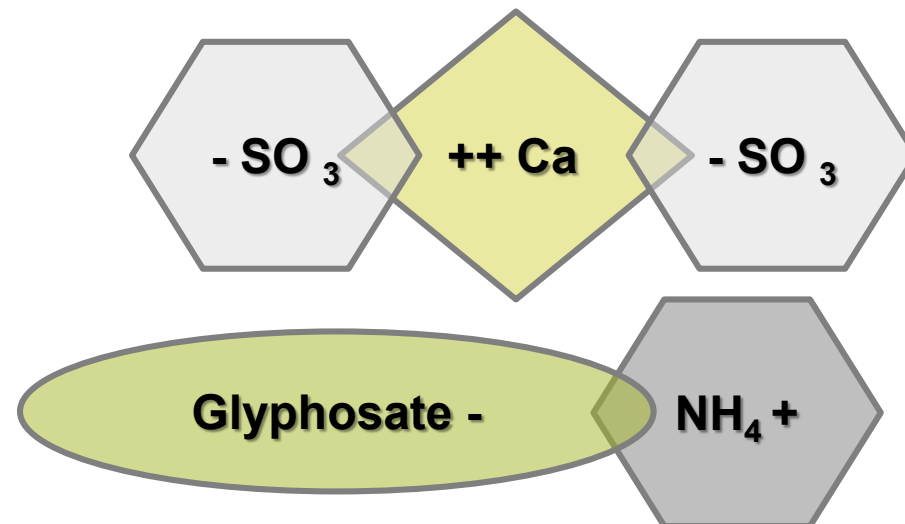


*Movement of hydrogen ions from the cytoplasm raises the pH inside the cell*

# AMS inactivates Water impurities

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- Presence of cations (hard water) or particulate matter can reduce herbicide effectiveness:
  - May cause active ingredient to precipitate out of spray solution, reducing quantity available for plant uptake
  - May bind with herbicide, slowing rate of absorption by plant



# Jar test for physical incompatibility

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- Start with 1 pint of carrier in a 1-quart jar
  - Use the same water source
- Add products according to ratio and order you will use in spray tank
  - 1 pt product = 0.5 t (2.5 mL), 1 lb product = 1.5 t
- Cap the jar and invert to mix. Let stand for 30 min
- Observe
  - Did the mixture separate, thicken, or precipitate?
  - Did the reaction produce heat?



# Tank mix order

- **W – Wetables**
- A – Agitation
- L – Liquids
- **E – Emulsifiable concentrates**
- **S – Surfactants**

It's not so simple any more...