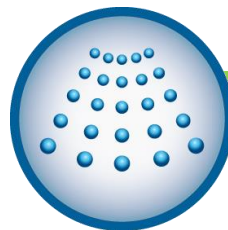




Loveland Adjuvants and Weed Control

Ron Heavner PPM Loveland

Get Growing



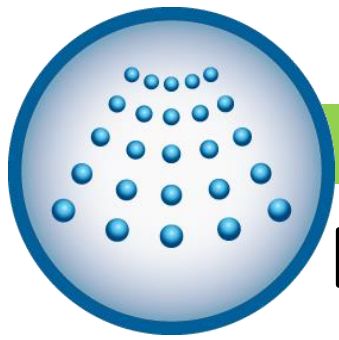
TO THE PLANT
DRIFT REDUCTION



ON THE PLANT
DROPLET RETENTION



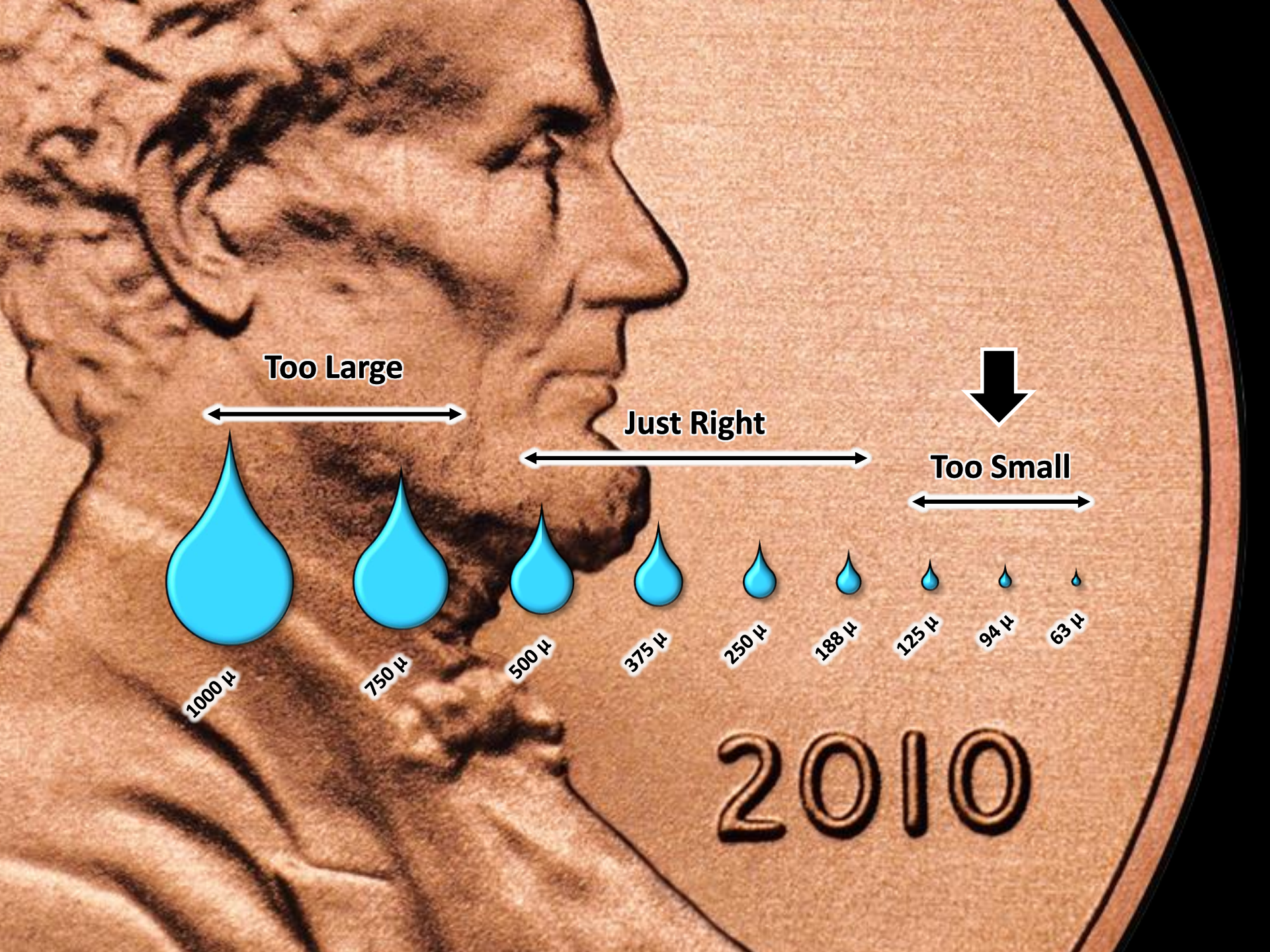
IN THE PLANT
PENETRATION



TO THE PLANT

Drift Reduction with Performance Sized Droplets.





Too Large

Just Right

Too Small

1000 μ

750 μ

500 μ

375 μ

250 μ

188 μ

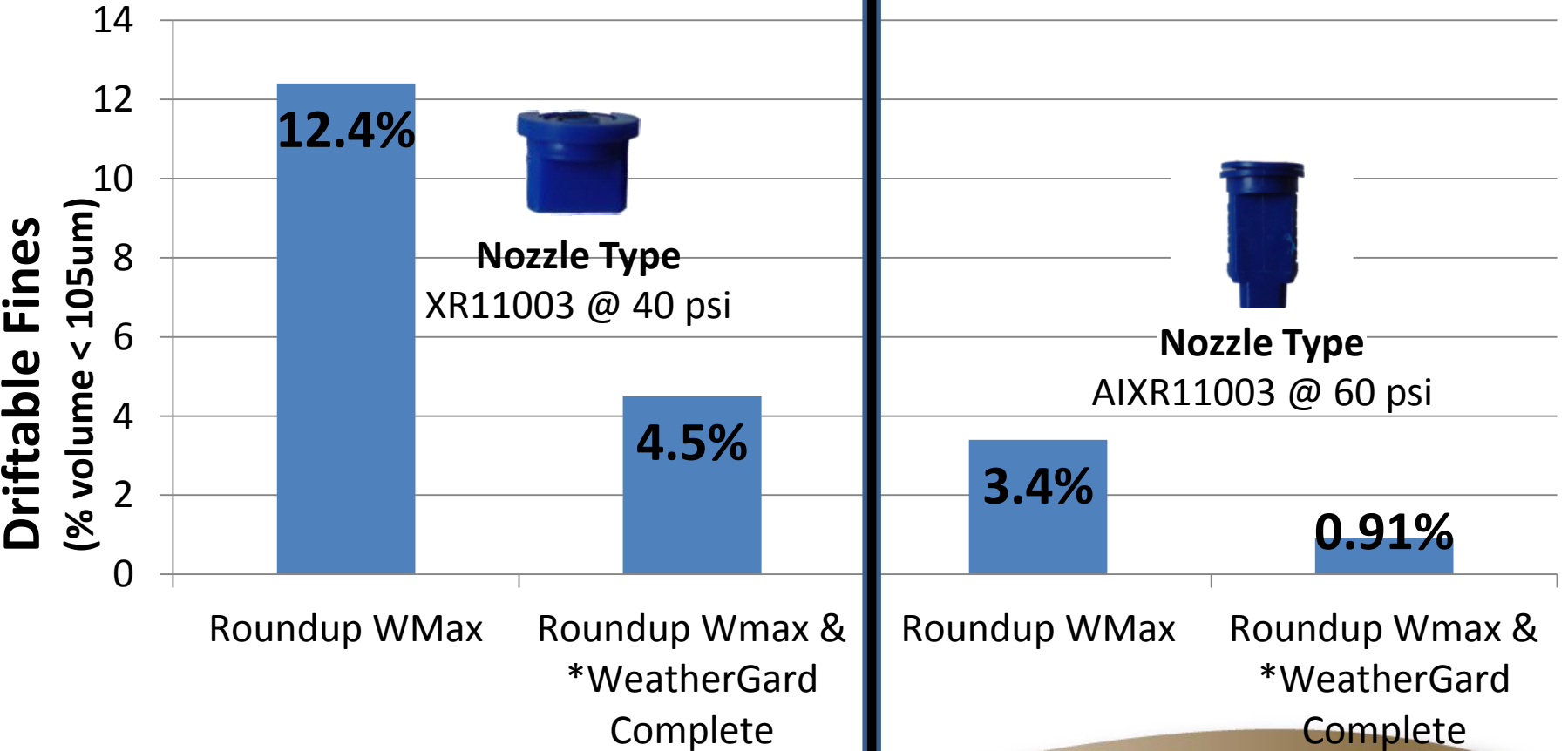
125 μ

94 μ

63 μ

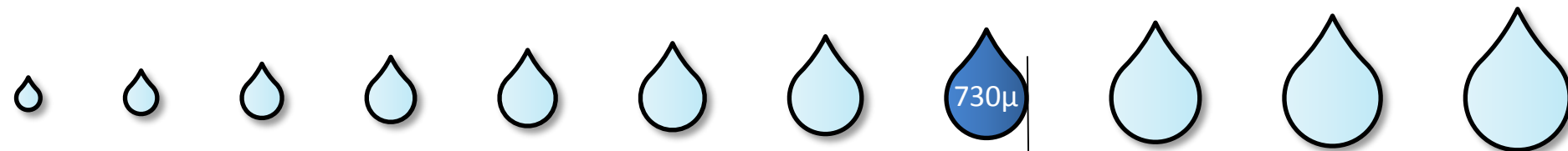
2010

Leci-Tech formulation affect on Driftable Fines

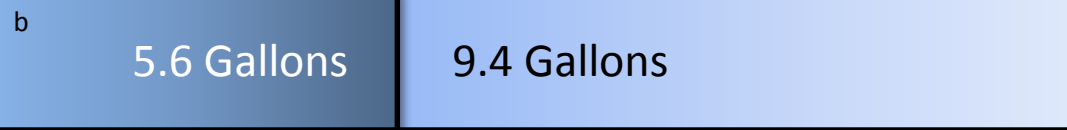


Just Right

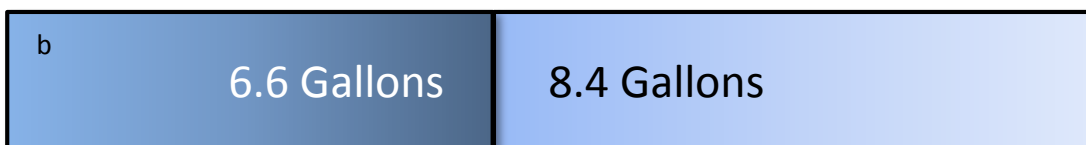
Too Large



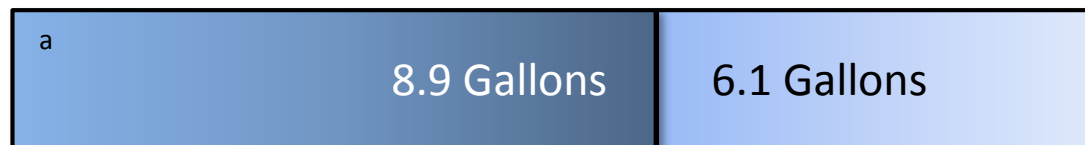
Dicamba Only



Dicamba & PowerMax



Dicamba & PowerMax
& **Liberate**



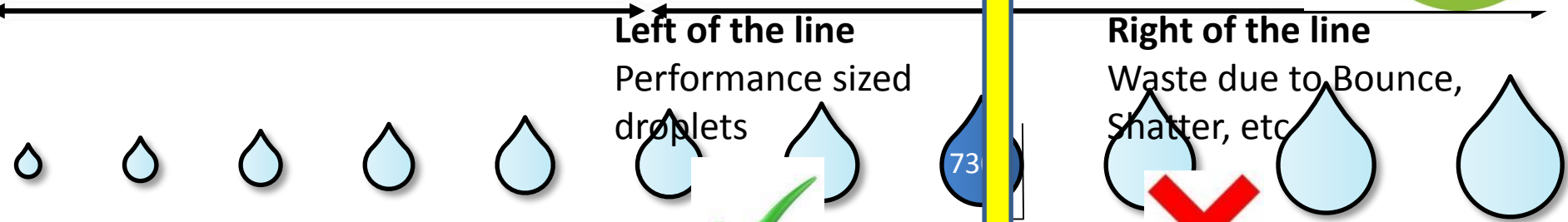
Total Spray Volume = 15 GPA

The Performance Line



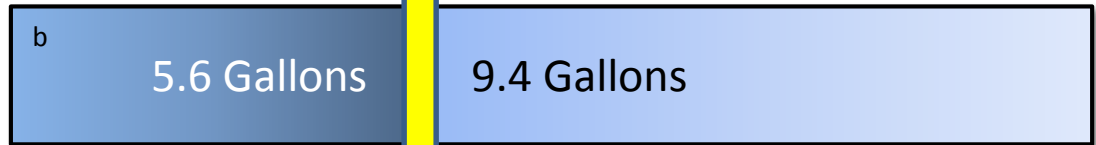
Just Right

Too Large



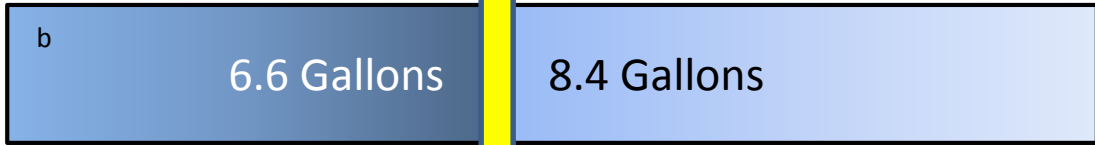
Dicamba Only

37%



Dicamba & PowerMax

44%



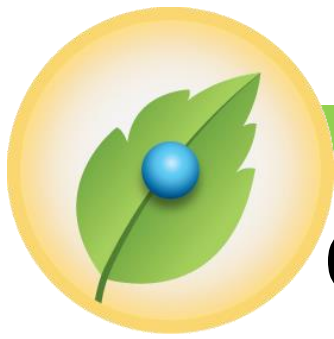
Dicamba & PowerMax & **Liberate**

^a 59%



TT11004 @ 40 PSI
Wind speed 15 mph
Sympatec Helos KR
Alpha =0.05 level
U of Neb - 2012

percentage of the spray volume that is 730 μm and larger



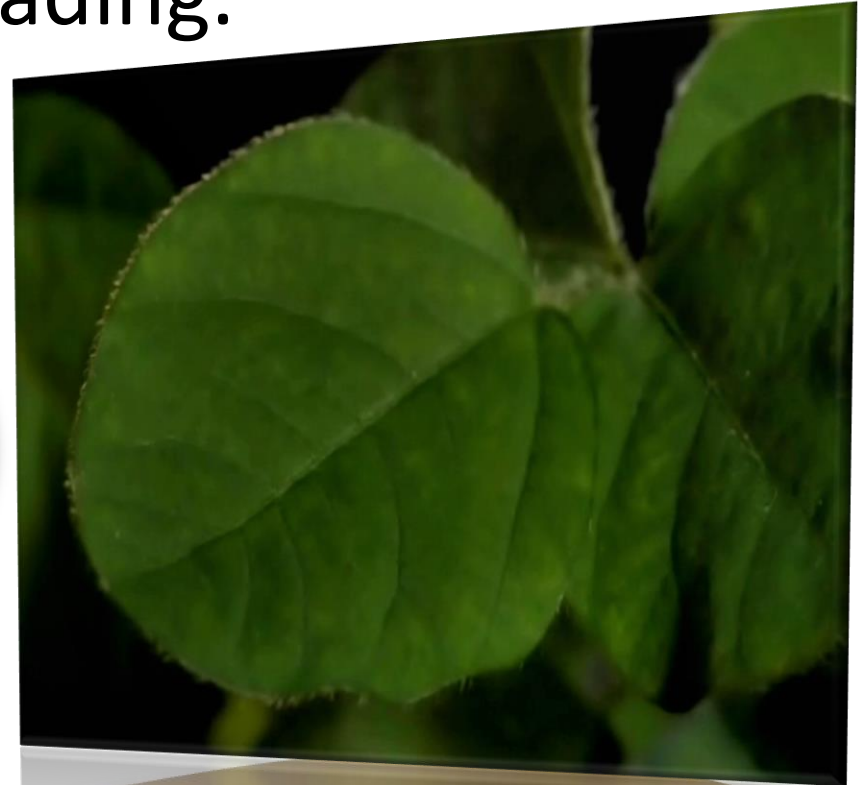
ON THE PLANT

On The Plant – Droplet Retention by Adhesion & Spreading.



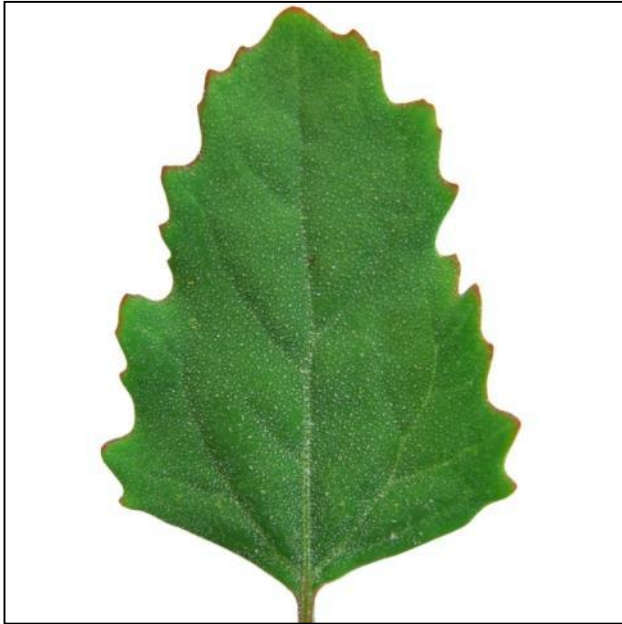
Glyphosate

Glyphosate
+ Leci-Tech





Droplet Retention



Control



2% Glyphosate + 5% Kaolin



2% Glyphosate +
0.25% Liberate +
5% Kaolin



NOTE: Kaolin has dried and is therefore more visible on leaf surface.



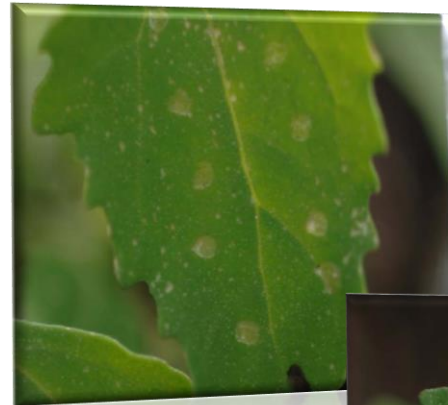
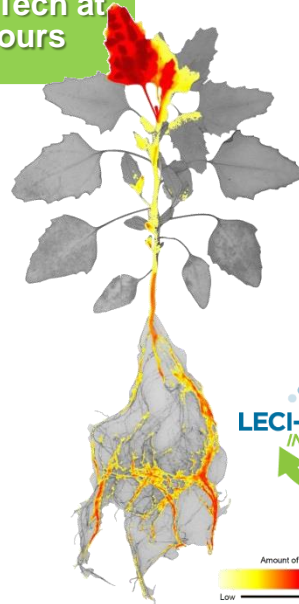
IN THE PLANT

In The Plant – Increased Penetration without Cuticle Disruption

2% Glyphosate at 48 hours



2% Glyphosate + Leci-Tech at 48 hours



Penetration





2% Glyphosate
at 48 Hours

Amount of Radioactivity



Low



High



2% Glyphosate
& .25% Leci-Tech
at 48 Hours



Amount of Radioactivity



Low



High



LI 700[®]



TO ON IN

- **pH Reduction**



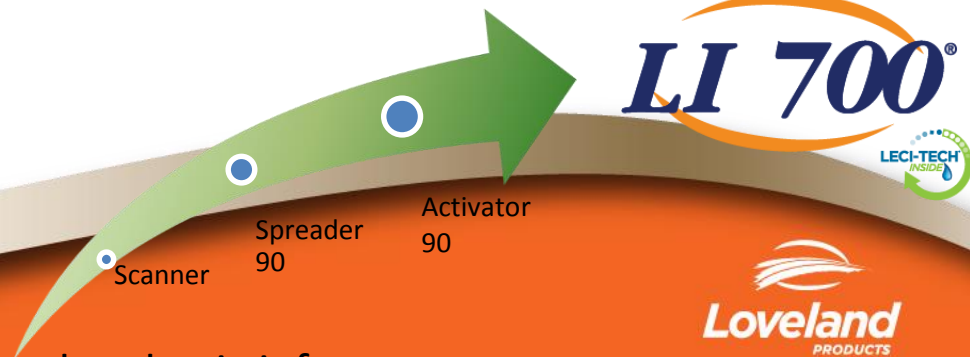
The World's Best Selling Adjuvant

Application Info

- 1-2QTs/100GLs
- Add to tank last

Opportunity

- Post Emerge Weak Acid Herbicides
- Insecticides
- PGHs & Defoliant
- Foliar Nutrients

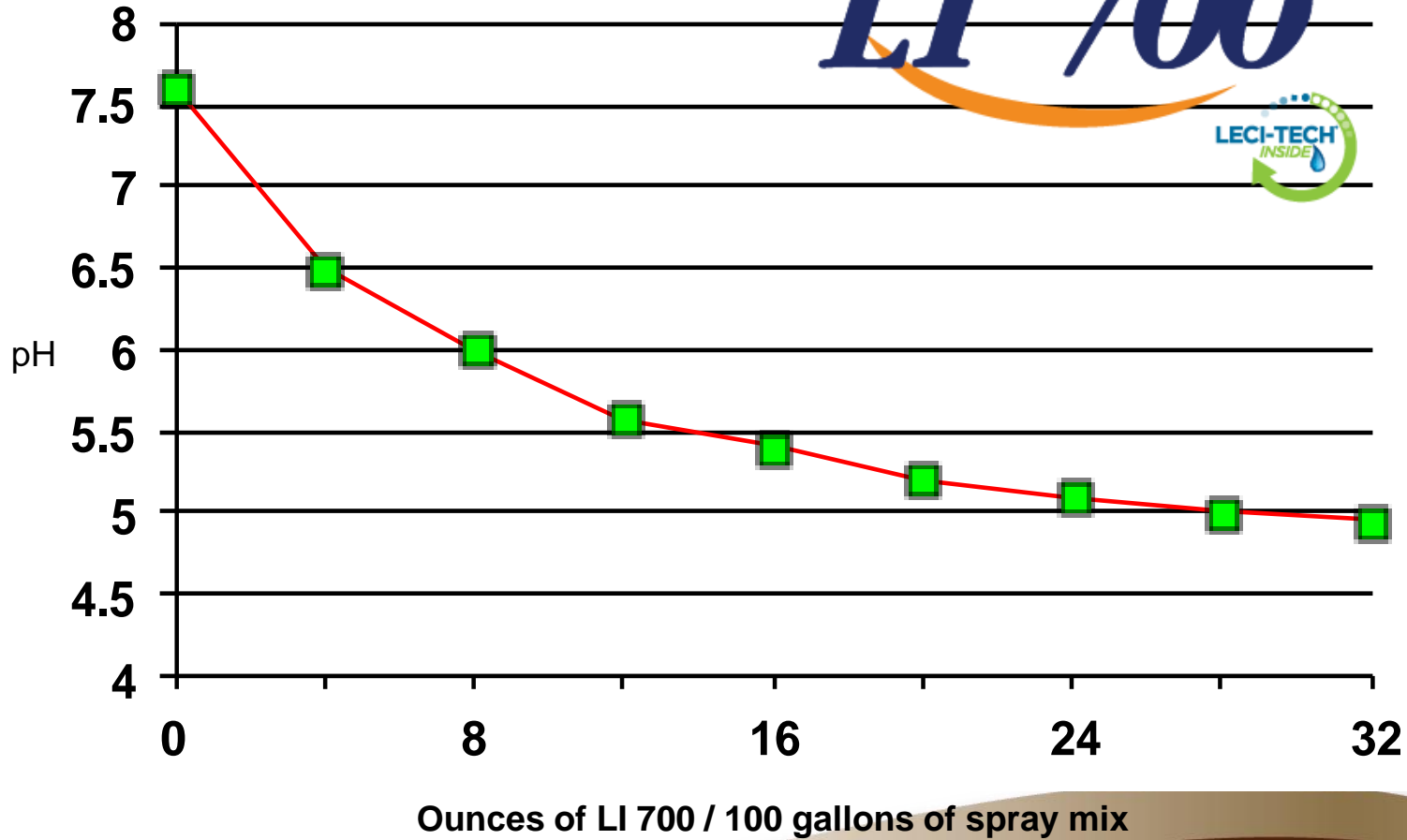


Reference Only. Please Refer to Label for rate and tank mix info

LI 700 Lower the Spray Solution pH by 1 pH Unit for About Every 12 Fluid Ounces Added.

Alkaline hydrolysis

LI 700[®]

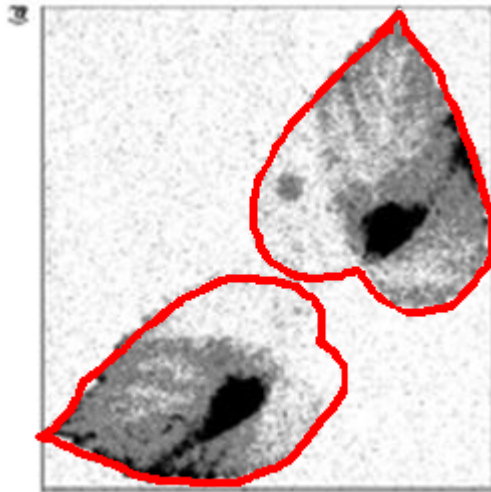


C-14 Imidacloprid Study *LI 700*[®]

7 days after application



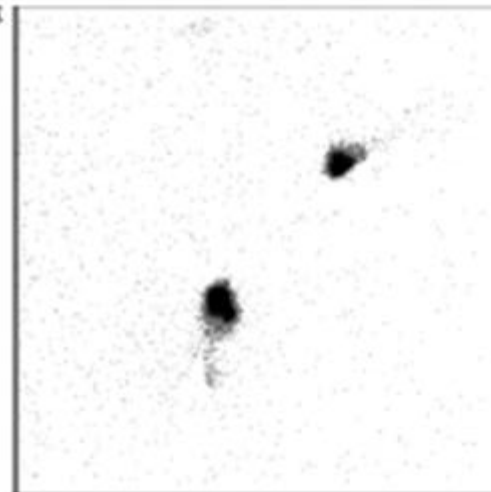
70-80% uptake



Imidacloprid +



10% uptake

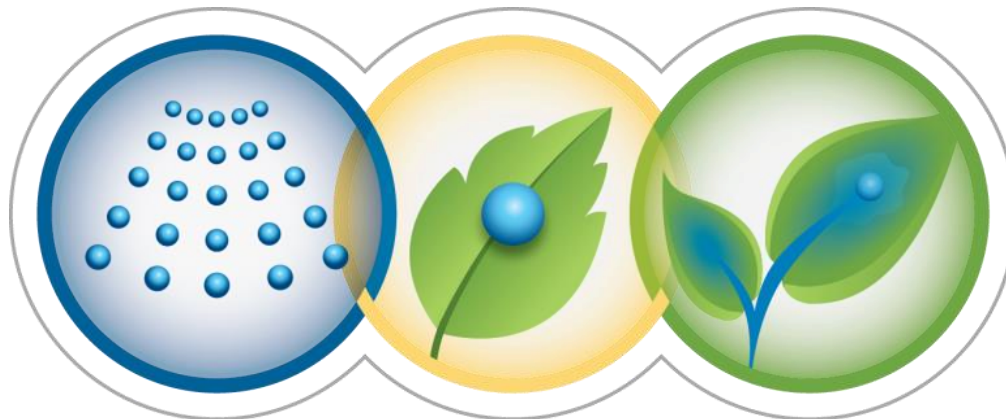


Imidacloprid

Lars Weichel and Ralf Nauen: Bayer CropScience AG, Research, Global Biology Insecticides, Alfred Nobel Str 50, D-40789 Monheim, Germany



Liberate®



TO ON IN

- Neutral pH – ideally used with SU's
- 100% active, Odorless & Defoamer



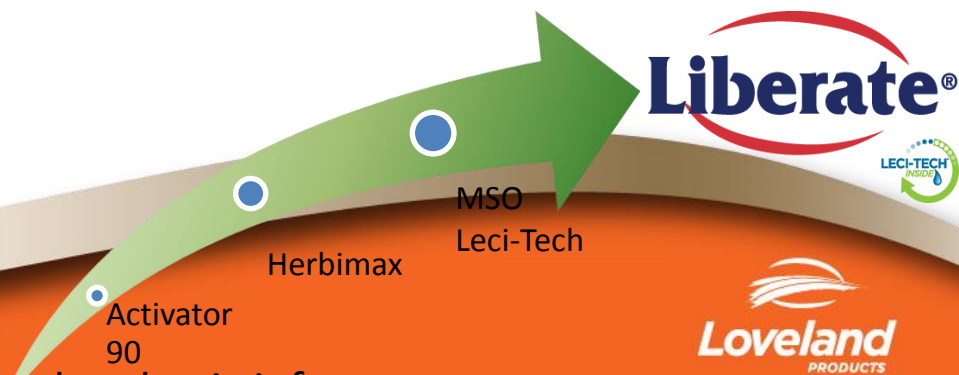
Most versatile adjuvant in the market today

Application Info

- 1-2QTs/100GLs
- Add to tank last

Opportunity

- Sulfonyl Urea (SU)
Herbicides
- Fungicides
- When mixing water and oil soluble chem together
- Those chemistries requiring a neutral pH

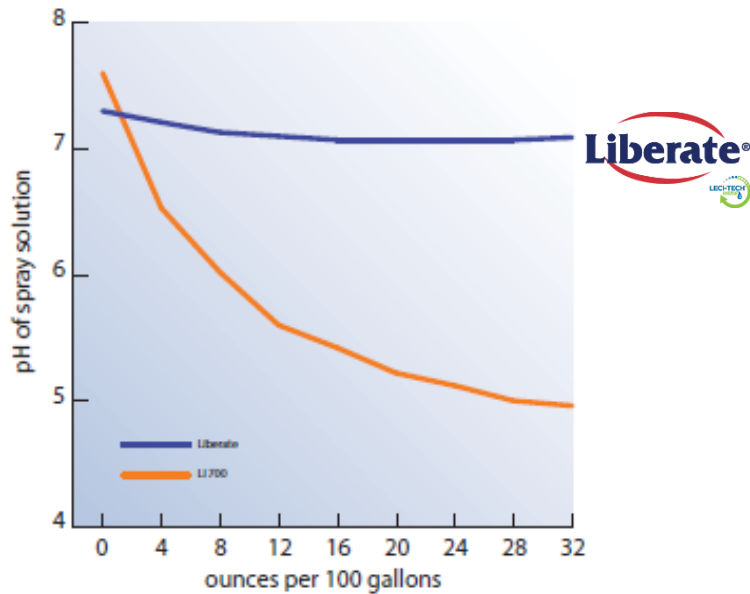


Reference Only. Please Refer to Label for rate and tank mix info

Liberate®



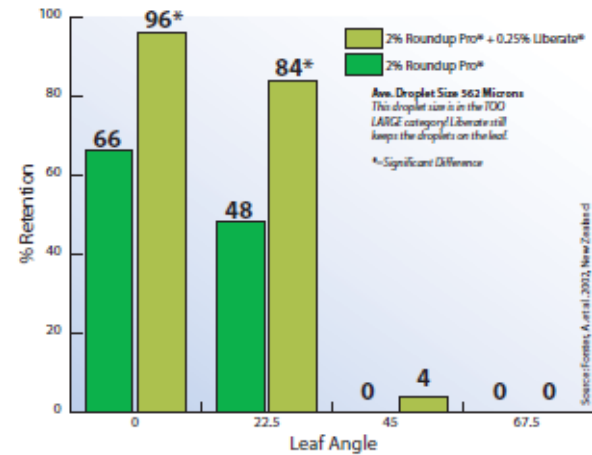
pH neutral



Liberate will not acidify the spray mixture.

Helps retain droplets on the leaf surface

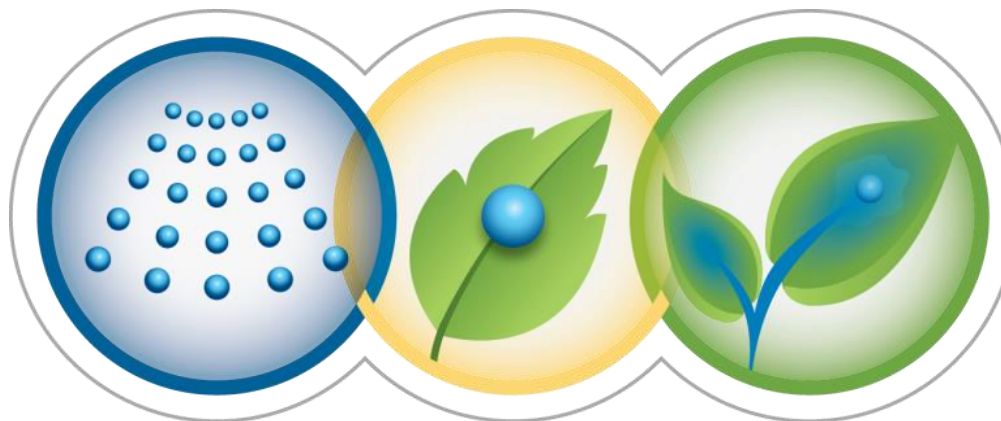
Even on waxy leaf surfaces like lambsquarters, Liberate helps retain droplets that are too large for the best coverage.



As leaf angle changes, **Liberate** keeps even large droplets on the leaf surface. This is an important part of consistent performance of post-emergence herbicides. However, **Liberate** produces more droplets in the **RIGHT SIZE** for the best possible coverage.



M^{SO}® CONCENTRATE with LECI-TECH



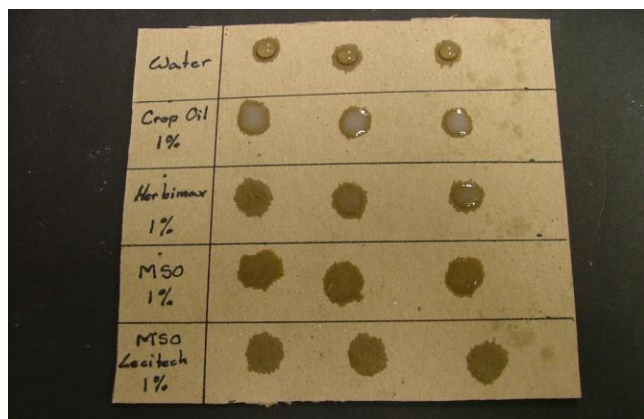
TO ON IN

- Increased plant uptake V's standard MSO formulations
- Improved crop safety V's standard MSO formulations

MISO[®] CONCENTRATE with LECI-TECH



Superior Cuticle Penetration



Methylated Seed Oils (MSOs) are utilized when superior cuticle penetration is needed. MSO is often used with herbicides during hot, dry conditions. During these stressful environmental conditions, plants will develop thick waxy cuticles in an effort to conserve moisture. The demonstration above compares the differences in activity of water, crop oil and *MSO Concentrate with LECI-TECH*. The ability of MSO to solubilize a waxy cuticle is shown in the chart below.

Penetrating Ability of Methylated Seed Oil Green Foxtail Wax Solubility

	Exposure interval (min)					
	0	5	10	20	40	24 hrs
Distilled Water	0	0	0	0	0	0
Petroleum Oil	0	0	0	2.5	2.5	9
Sunflower Oil	0	0	0	0	2.5	6
Methylated Seed Oil	2.5	5	6.5	9	10	10

Evaluation scale: 0=no solubility; 10=totally dissolved

Manthey, F.A. and J.D. Nalewaja; NDSU, Fargo, ND; 1992

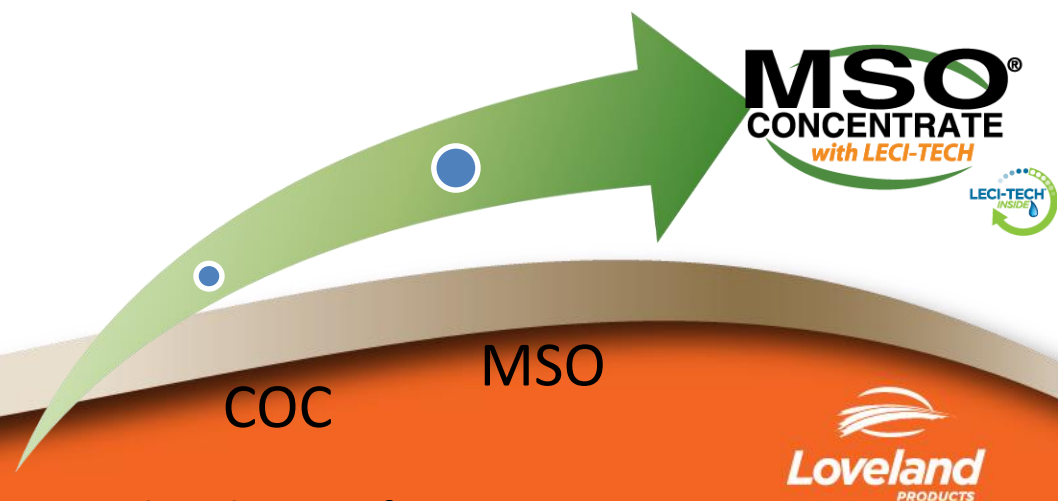
Hard on Weeds, gentle on Crops!

Application Info

- 1-2PTs/Acre
- Add to tank last

Opportunity

- Kixor Technology
- Clethodim (Intensity One)
- Wherever an MSO is called for





A multi-purpose adjuvant designed to lock-up all hard water cations, allowing maximum herbicide performance, unlike AMS that only locks up calcium.



<u><i>Choice Weather Master</i></u>	<u><i>AMS</i></u>
Lower use rates	Higher use rates
Convenient liquid formulation	Bulky and difficult to handle
Effective on ALL hard water cations	Effective on only Calcium cations
MORE consistent PERFORMANCE	LESS consistent performance

ALWAYS add the water conditioner to the tank first!

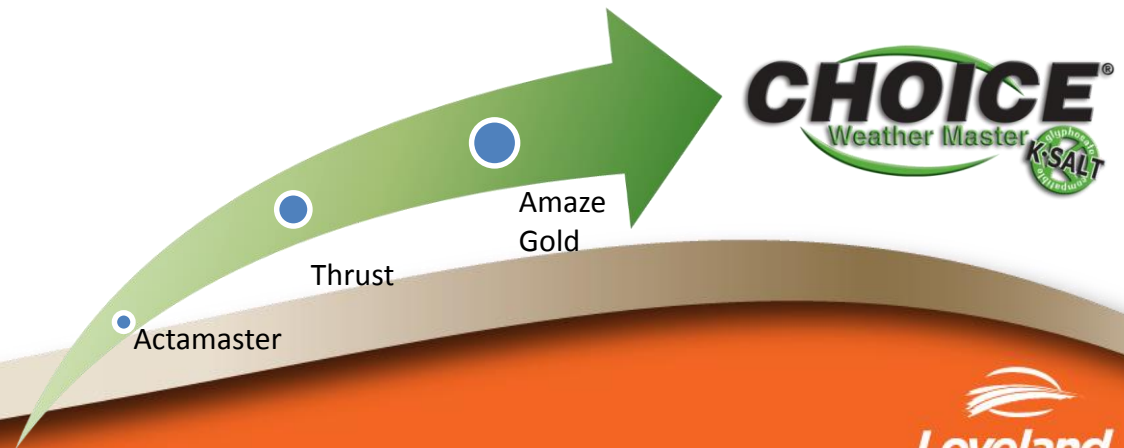


Application Info

- 1-2QTs/100GLs
- Add to tank first

Opportunity

- Weak Acid Herbicides; Particularly Glyphosate
- Applications where water conditioning is needed





CHOICE[®] TRIO is a non AMS liquid water conditioner designed to aid in the performance of herbicides susceptible to the negative effects of hard water. **CHOICE TRIO** performs via three modes of action; **sequestering, chelating, and complexing** of all hard water cations.



Features

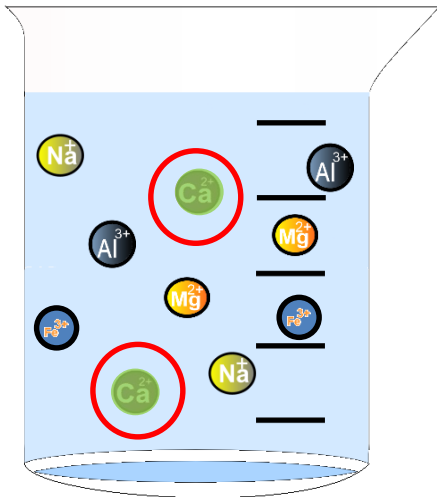
- Water conditioning of all hard water cations
- Proprietary Liquid Formulation; NO AMS
- Three acting components
 - Sequestering
 - Chelating
 - Complexing

Benefits

- Lower use rates than AMS
- Convenience over Dry AMS
- Effective on ALL hard water cations
- Can be used in applications where AMS not recommended

AMS

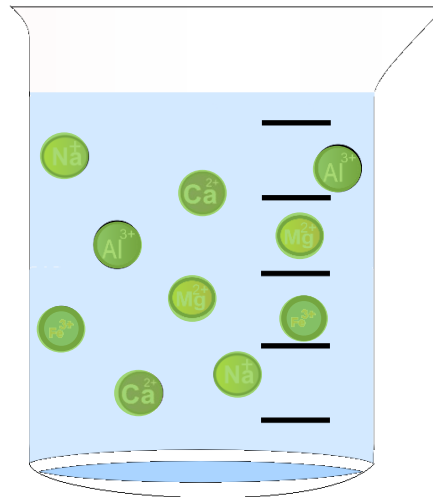
1 mode



Sulfate: Effective at tying up Calcium



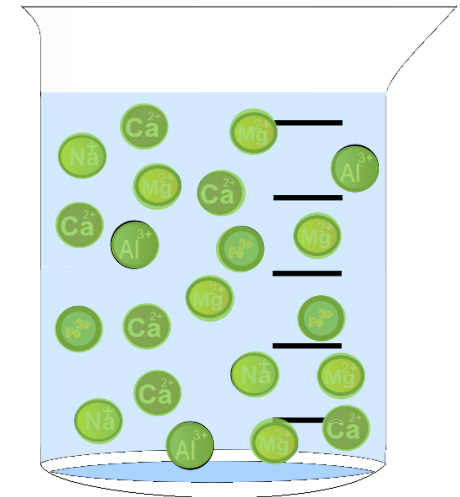
2 modes



Sequestering Complexing

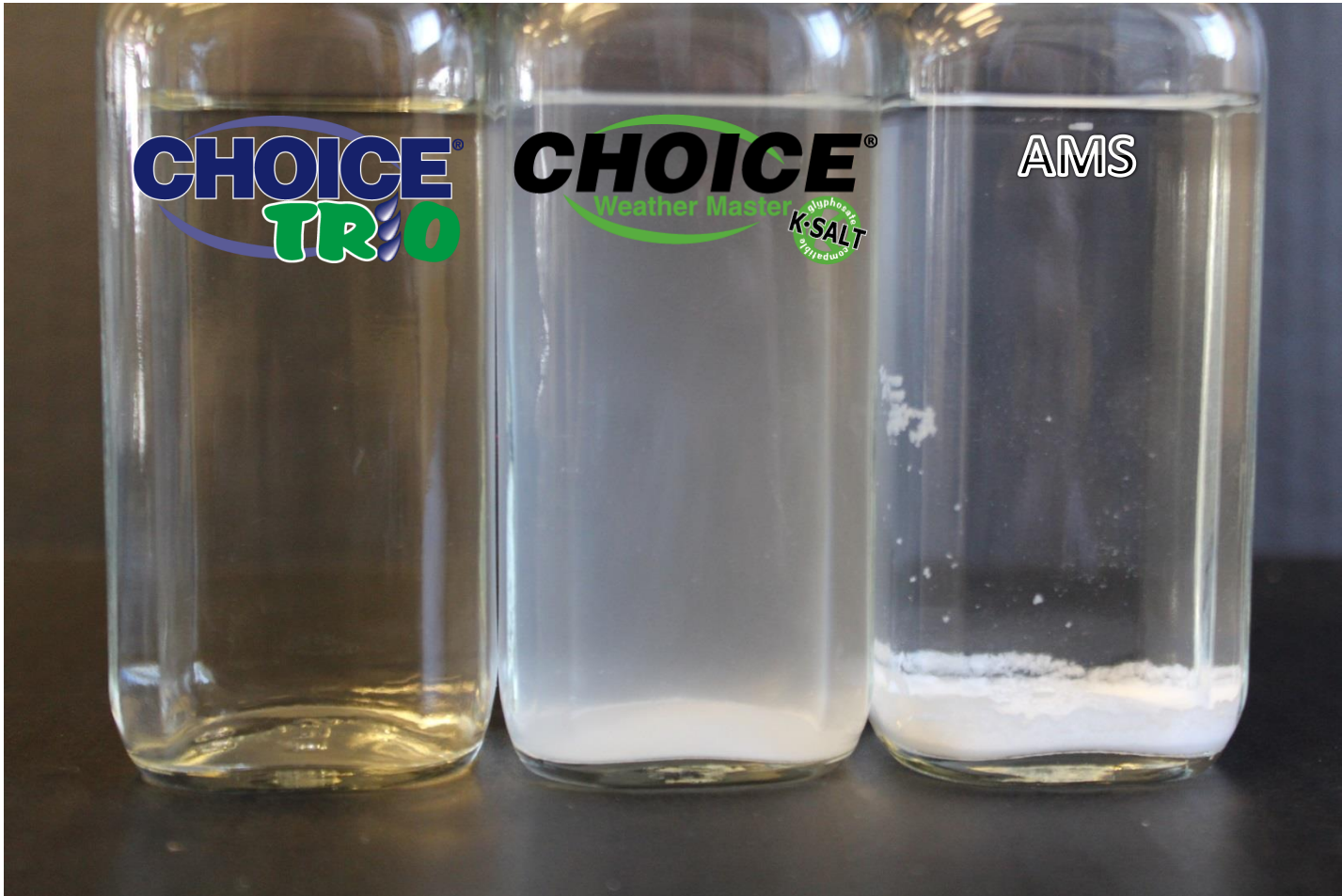


3 modes



Sequestering,
Synthetic Chelating
Complexing
No AMS





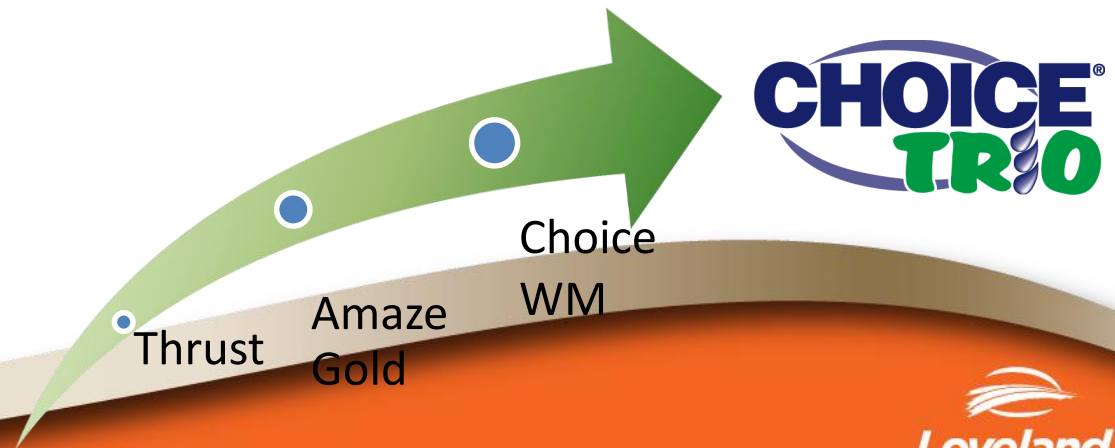


Application Info

- 1-2QTs/100GLs
- Add to tank first

Opportunity

- Weak Acid Herbicides; Particularly Glyphosate
- Applications where water conditioning is needed



Thank You!