



Managing Weeds in Soybeans With Liberty and Engenia Herbicide

Derek Cottrill – BASF Technical Service Rep

Effective Weed Management

Key strategies

- Identify the target weeds
- Include multiple, effective sites of action (SOA)
- Use a good residual PRE herbicide
- Spray your POST herbicide early
 - 4" max weed height
 - Target application at 3 to 5 weeks after planting for soybeans¹
 - Add a residual herbicide to the POST



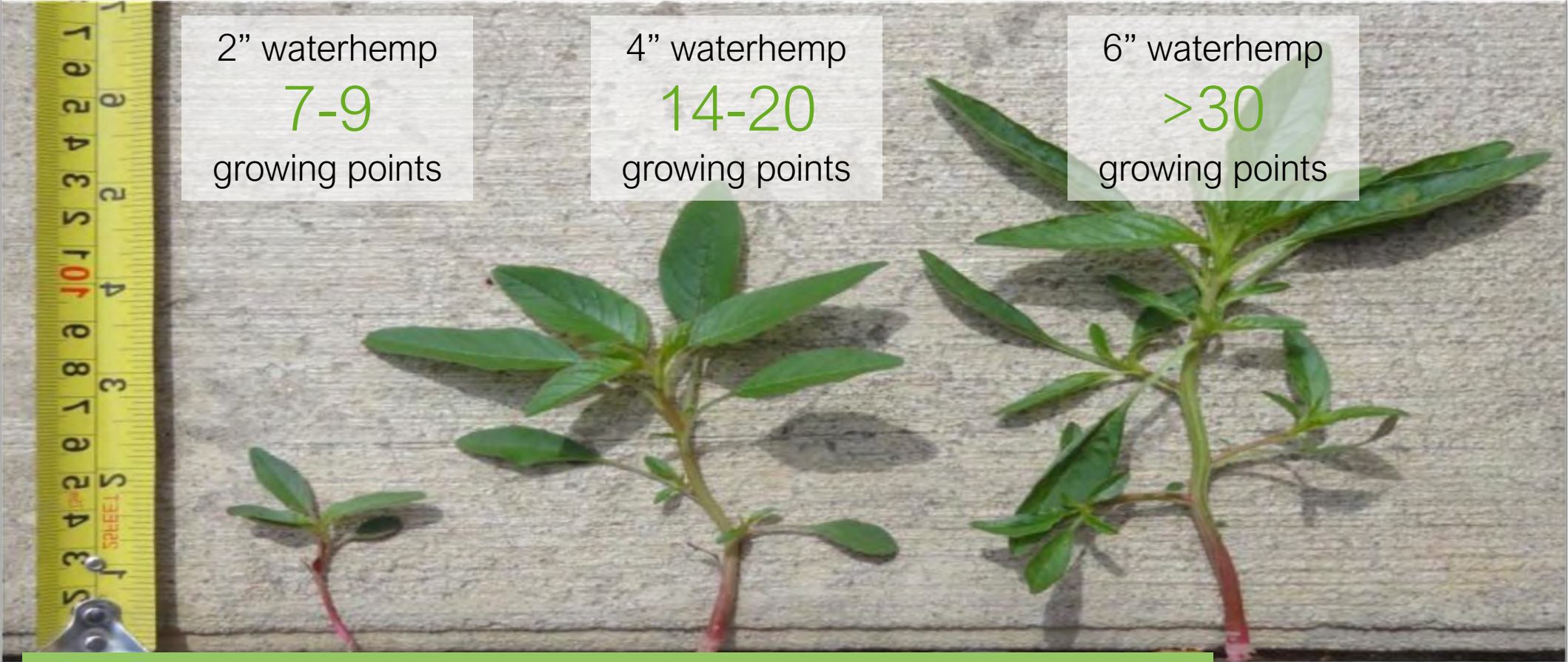
Tailor your weed management plan to the field

Minimize Escapes!



Post-Emergence Strategies Break

Why?



An un-emerged weed has **ONE** growing point to control!



Engenia[®] Herbicide

Best Management Practices

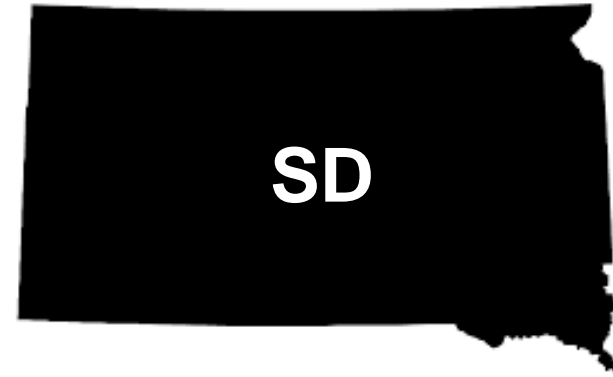
Derek Cottrill – BASF Technical Service Rep

Training For Approved Dicamba Formulations

- **This training satisfies the US EPA requirement for mandatory dicamba applicator training.**
 - Per the Engenia herbicide label (US EPA Reg No 7969-345): “**Prior to applying this product in the 2020 growing season**, all applicators must complete dicamba or auxin-specific training.”
- **Check with your state pesticide regulatory agency for additional training and application requirements or restrictions imposed by your state.**
- **This training is not a substitute for the state-specific Certified Applicator training required to purchase and apply a Restricted Use Pesticide**

Refer to specific state and local requirements for applicator certification process

South Dakota Additional State Information



Additional Requirements

- NO applications after June 30
 - SD Engenia applications: Up to 45 days after planting or R1, or June 30th, whichever comes first.
- Commercial applicators must retain records for 3 years.
- Private applicators must retain records for 2 years.

Additional Recommendations

- Tank mix and nozzle information must be printed and with the applicator at time of application, and attached to the spray records once the application is complete.
- Records are to be completed at the end of each day, and must include crop stage at the time of application.
- While not required, it is a best practice to be trained prior to purchase.

Engenia Herbicide

Additional labeled application requirements

- **Minimum application volume: 15 GPA**
- **Sprayer speed: ≤ 15 mph**
- **Rainfall:** DO NOT apply if expected rainfall within 24 hours after application will result in runoff
 - Rainfast: 4 hours
- **DO NOT apply aerially**
- **DO NOT** apply through any type of irrigation system



Additional state restrictions may apply

For Application Success, Follow These Best Practices:

Factor	Increase in off-target movement	Label Requirement
Nozzle choice	66X¹	Only use approved nozzles ²
Boom height	5.6X¹	Maintain boom height ≤ 24"
Wind speed	3.4X¹	Only spray if wind between 3-10 mph
Sensitive Areas & Crops	HIGH	Know what is downwind
Inversion	12X larger area	DO NOT spray during an inversion
AMS/UAN tank-mix	20X increase in volatility	Only use approved tank mixtures ²
Spray system hygiene	HIGH	Clean sprayer/mixing equipment before and after application

¹Based on increased deposition at 110' in AGDISP modeling.

²As listed on the website of the approved dicamba product.

Effective Weed Management

Use residual herbicide at planting

2016 – BASF Trial – 30 Days After Post – Story City, IA



POST ONLY (V3):

Engenia® herbicide (12.8 fl oz) + glyphosate



PRE: Zidua® PRO herbicide (6 fl oz)

POST (V3): Engenia herbicide (12.8 fl oz) + glyphosate

PRE residual followed by POST dicamba preserves yield potential

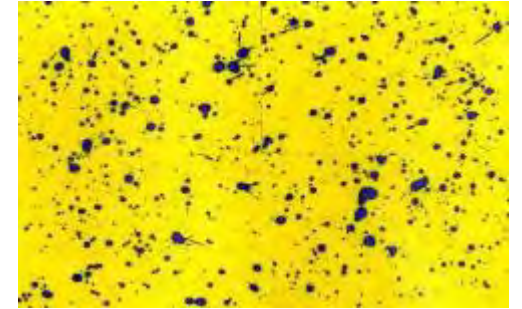
BASF
We create chemistry

Effective Weed Management

Best practices to optimize efficacy

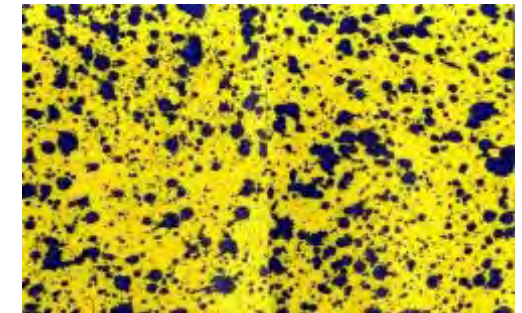
- **Required minimum spray volume – 15 GPA**
 - Better coverage for tough weeds
 - Match nozzle to GPA, pressure, and sprayer speed as specified by the label
- **Use an approved adjuvant (NIS, COC, HSOC, etc.)**
 - Maximizes dicamba uptake
 - Add approved Drift Reduction Agent (DRA) if required
- **Tank-mix with other herbicide SOAs when possible**
- **Pressure is just as important as GPA***

2017 BASF Spray Chamber Results



10 GPA

TTI 11003 at 40 PSI



15 GPA

TTI 11004 at 40 PSI

Engenia® herbicide
+ glyphosate + adjuvant



We create chemistry

Liberty[®] Herbicide

Best Management Practices

Derek Cottrill – BASF Technical Service Rep

Glufosinate across the globe

Key Facts & Benefits

- Widespread global use
- Uses in soybean, corn, canola and specialty crops
- Unique mode of action (10)
- Contact burndown
- Tank-mix Flexibility
- Very little weed resistance in US. (Italian Ryegrass)

LIBERTY
LINK® 



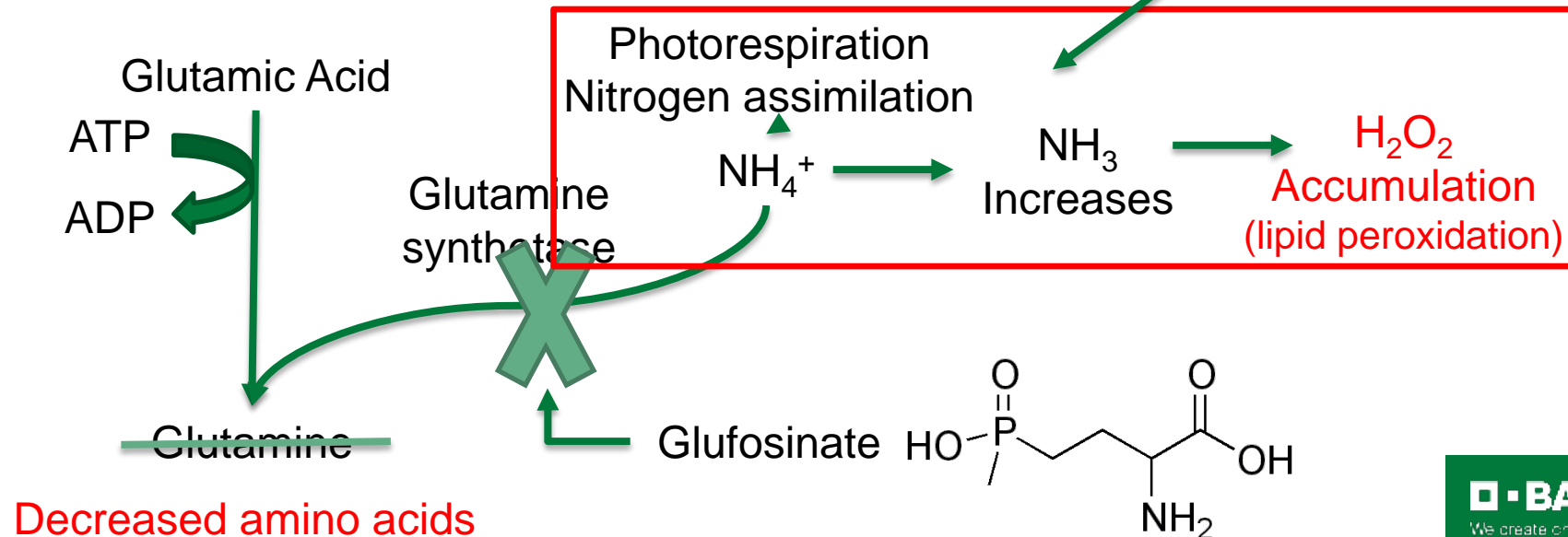
100+ crops in **82** countries

Liberty (Glufosinate) Chemistry – Mode of Action

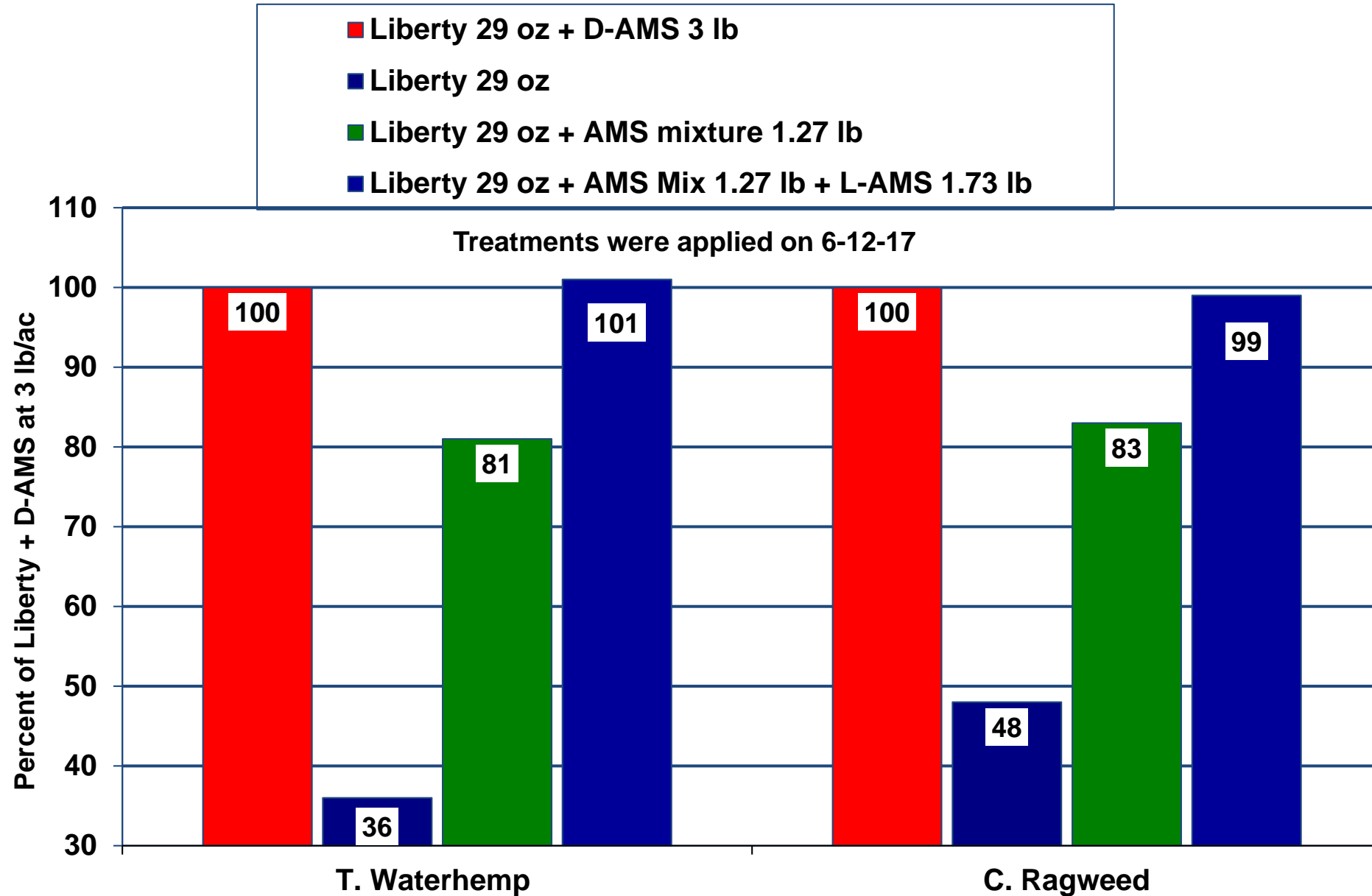
- Contact herbicide, WSSA Group 10 (only HRAC group 10 herbicide)
- The primary mode of action of Glufosinate-ammonium is the inhibition of the glutamine synthetase enzyme. This enzyme catalyzes the synthesis of glutamine from glutamate and ammonia (NH₃) and plays a central role in plant nitrogen metabolism.
- **Glufosinate treated plants die due to a buildup of ammonia,** leading to the uncoupling of photophosphorylation, causing the production of reactive oxygen species, lipid peroxidation, and membrane destruction.

Why is the addition of AMS important for weed control with Liberty herbicide?

Recommended 3 lbs/A of actual AMS in Liberty tank-mixes in northern geographies.



Liberty +/- AMS



Optimizing Applications: with Higher GPA and Correct Droplets



Liberty @ 10 GPA
(not enough carrier)

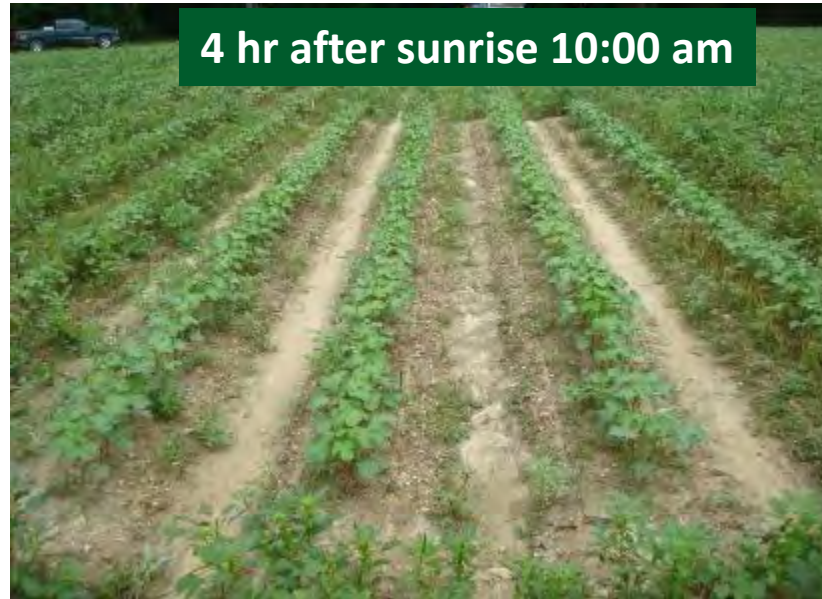


Liberty @ 20 GPA
Medium Droplets



Liberty @ 20 GPA
Very Coarse Droplets

Liberty Herbicide - Application timing



32 oz/A @16 GPA

16 DAT

North Carolina State Univ

Dr. Alan York

Liberty Herbicide Recommendations for Soybeans

Liberty Herbicide Recommendations for Soybean

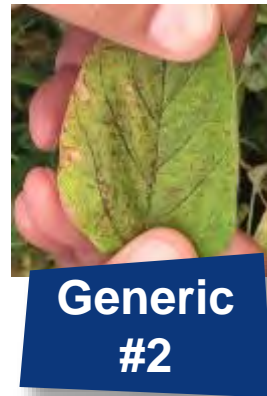
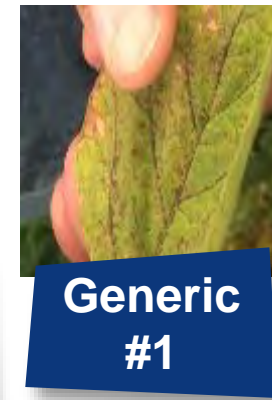
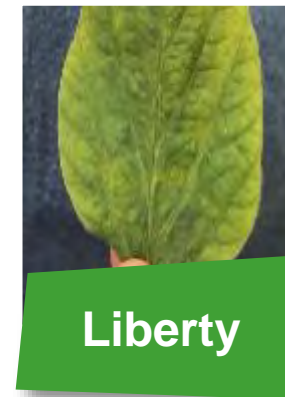
Program	Pre-emergence Residual	Post Application	Second Post Application	Seasonal Max Rate
Guidelines	<ul style="list-style-type: none"> • Pre-plant • Pre-plant incorporated • At planting 	<ul style="list-style-type: none"> • Weeds <3" • Use a residual tankmix 	<ul style="list-style-type: none"> • Min. 5 days after first application 	
Recommended Program	Verdict 5-10 fl oz/A Zidua PRO 4.5-6 fl oz/A, Zidua SC 2.5-3.25 fl oz/A Outlook 12-21 fl oz/A	Liberty 32 fl oz/A + Outlook or Zidua	Liberty 32 fl oz/A + Outlook or Zidua	87 fl oz/A
Extreme Application Conditions	If environmental conditions prevent timely application	Liberty up to 43 fl oz/A + Outlook or Zidua	Liberty up to 43 fl oz/A + Outlook or Zidua	87 fl oz/A

General Recommendations/Requirements

Keys to Success

- Start Clean, Stay Clean – Always apply a PRE
- Pair with residuals PRE or POST
- Target small weeds (<3")
- Coverage
 - ▶ **GPA:** 15 GPA minimum, 20 GPA recommended
 - ▶ **Nozzle:** medium to coarse droplets
 - ▶ **AMS:** 1.5 – 3 lbs/A, 3 lbs/A of actual AMS is highly recommended in northern geographies.
 - ▶ **Weed height:** <3"
- Environmental Conditions
 - Avoid early morning dews and late evening applications
 - Warm Temperatures (60°F+)
 - Relative humidity is very important (60%+)
 - Sunlight
 - 4 hr rainfast

LIBERTY
LINK® 





We create chemistry