

Weed Control in Cotton



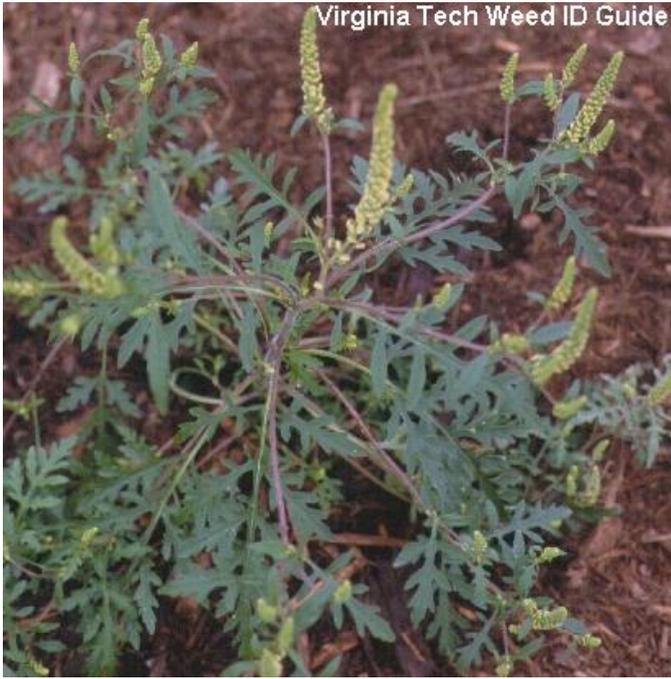
Bayer CropScience Announces Liberty Herbicide to Replace Ignite Herbicide for LibertyLink Crops



Press Release: Bayer CropScience – Wed, Jan 4, 2012 3:45 PM EST



Liberty
Ignite ^ Smokes Weeds



Glyphosate- Resistant Weeds in NC



Virginia Tech Weed ID Guide



Horseweed Control in No-Till Cotton

- Focus on effective burndown program.
- RRF cotton: Only in-crop option is Liberty under hood
- LL or WRF cotton: Can use Liberty overtop



Burndown Programs for Glyphosate-Resistant Horseweed

Two components of burndown program:

1. Something to kill emerged horseweed*
2. Something to give residual control

Programs:

Glyphosate + Clarity (1/2 pt)** + Valor

Glyphosate + 2,4-D (2 pt)** + Valor

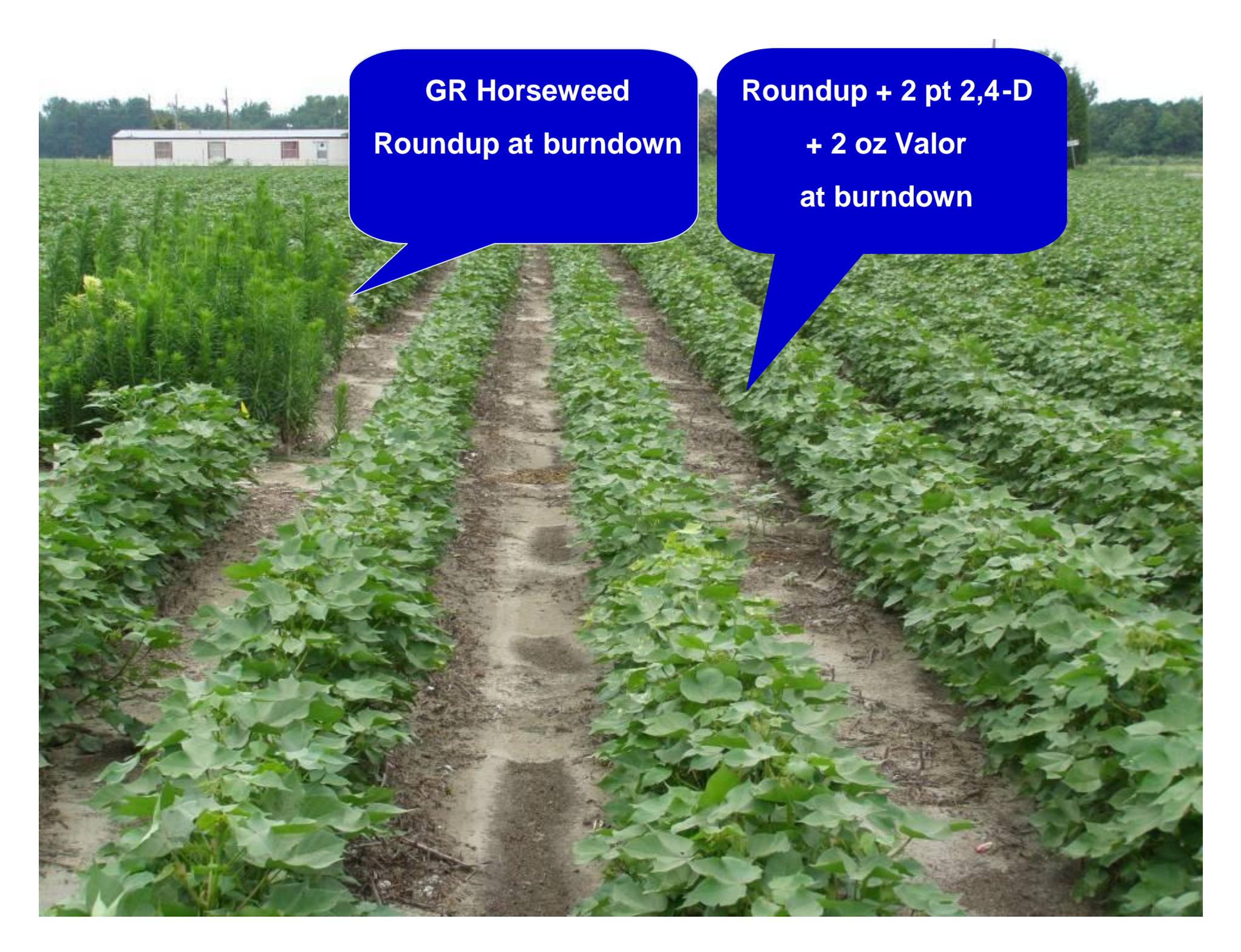
*Best if applied while weed still in rosette state (top picture)

**Waiting intervals required

Clarity: 21 days + rain (cotton)

2,4-D: 30 days (cotton)





**GR Horseweed
Roundup at burndown**

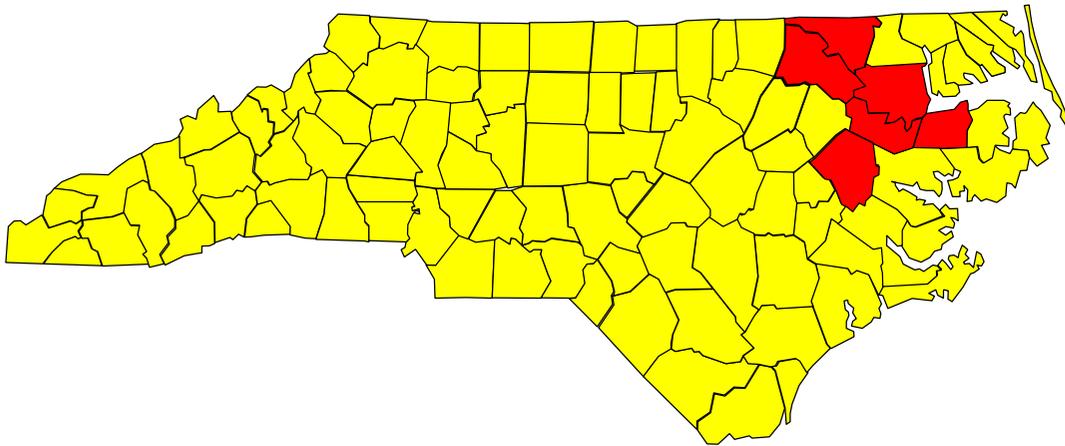
**Roundup + 2 pt 2,4-D
+ 2 oz Valor
at burndown**



Roundup + Sharpen, burndown on
glyphosate-resistant horseweed.

42-day waiting period for cotton.

Glyphosate-resistant common ragweed



Controlling Glyphosate-Resistant Common Ragweed in Cotton



1. Residual herbicide Preplant or PRE

Cotoran	E	Direx	G	Prowl	N
		Reflex	G	Staple	N
		Valor	G		

2. POST overtop options limited

Ignite	E	Envoke	G	Staple	P
		(must be small, < 2")			

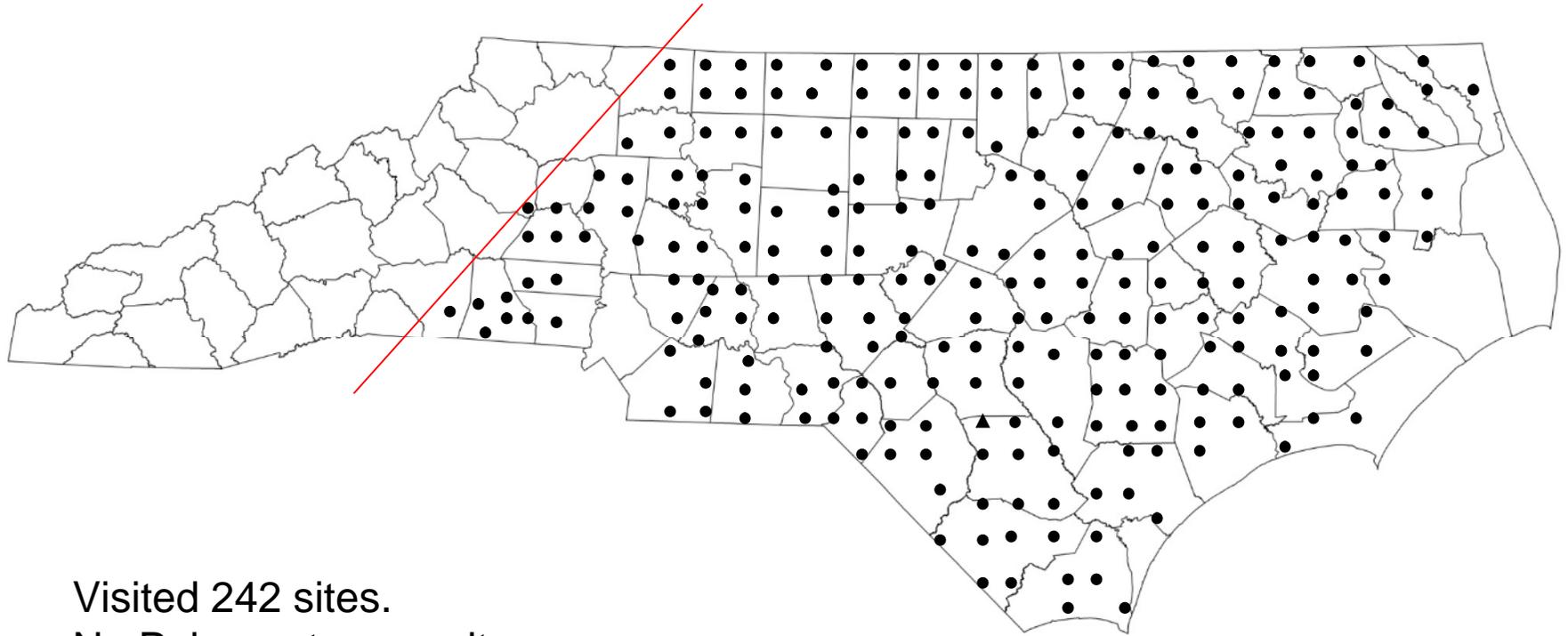
3. Many POST-directed options

Caparol + MSMA	E	Cotoran + MSMA	GE
Cobra + MSMA	E	Valor + MSMA	GE
Direx + MSMA	E		
Layby Pro + MSMA	E		
Suprend + MSMA	E		

* Include Gramoxone at planting in no-till systems.

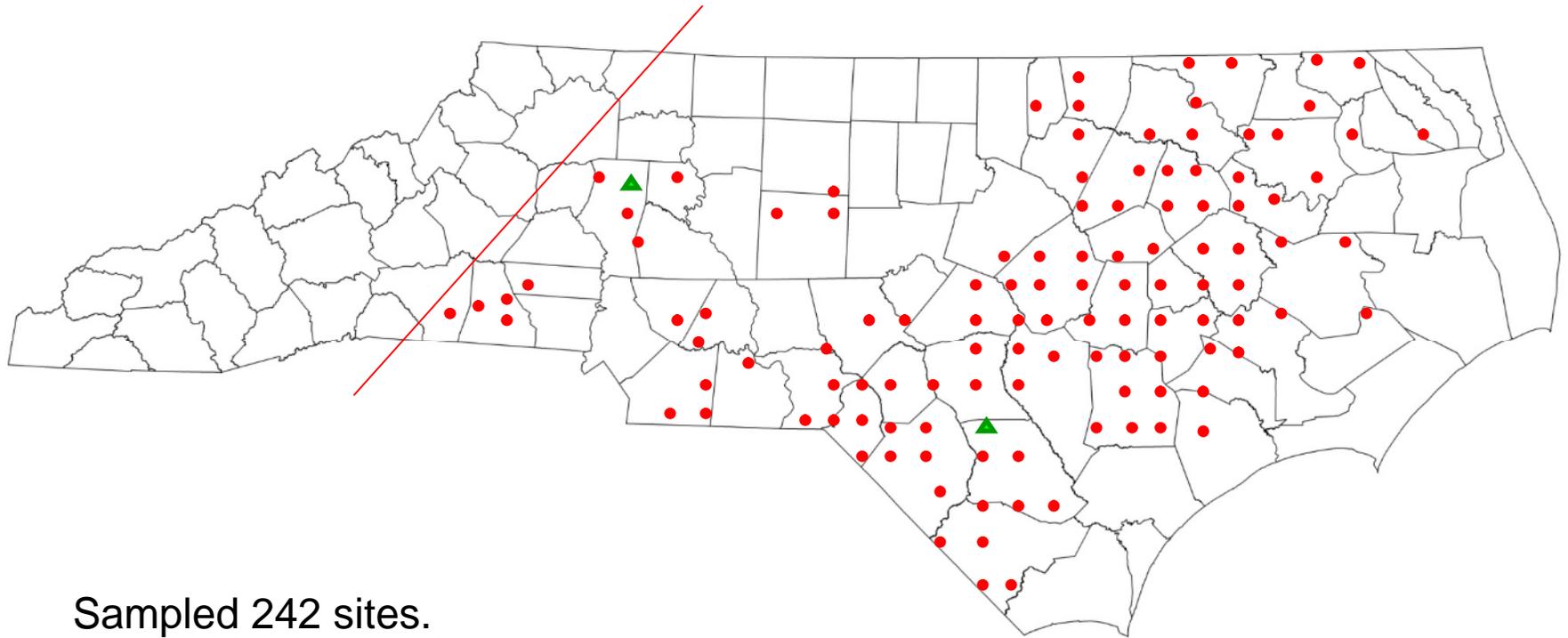


PALMER AMARANTH SURVEY, FALL 2010



Visited 242 sites.
No Palmer at some sites.

PALMER AMARANTH SURVEY, FALL 2010



Sampled 242 sites.

131 sites (54%) had Palmer amaranth

98.5% of Palmer amaranth sampled was glyphosate-resistant.

● Glyphosate-resistant

▲ Glyphosate-susceptible

Cotton growers have adopted management programs



2006



2011



Why is seed bank
management
critical?

Biology of Palmer Amaranth

- Prolific seed production
 - 450,000 seed/plant grown in competition with cotton (Sosnoskie and Culpepper, UGA)
 - Equivalent to 10 seed/ft² if evenly distributed over an acre



How can we reduce seed bank?









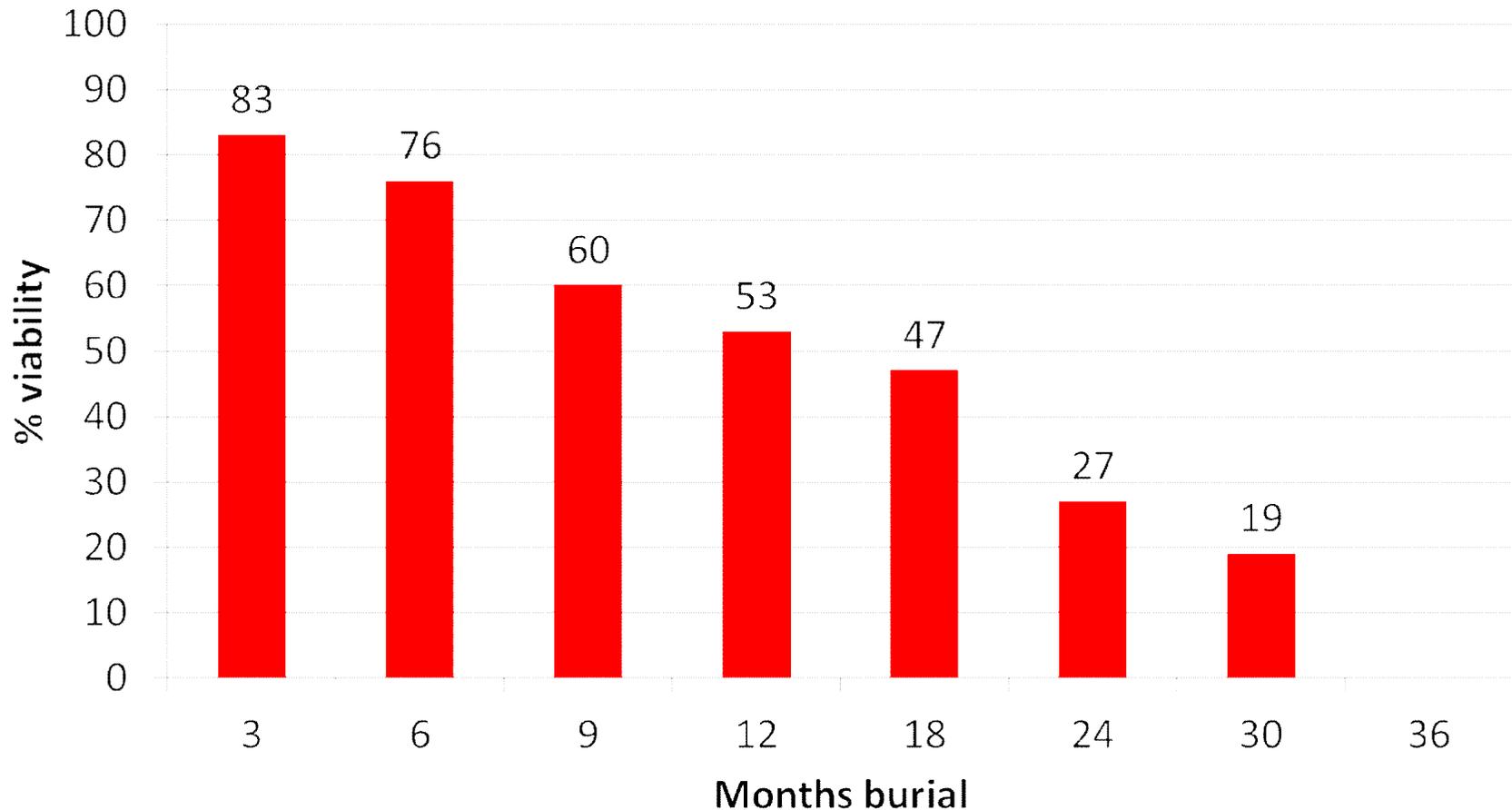
Impact of Crop Rotation and Good Control in Rotational Crop (whole field in soybean in 2009; all treated alike in 2009)



} Soybean
2008

} Tobacco
2008

Loss in viability of buried Palmer amaranth seed. Univ. Georgia.*



- Data averaged over two biotypes, two collection/start years, and four burial depths. Webster, Sosnoskie, and Culpepper.

POST-Harvest Palmer Amaranth Control



Untreated



Treated

What should a grower do concerning variety selection and resistant Palmer amaranth?

- Variety (and trait) selection will be a key decision for growers .
- In fields heavily infested with glyphosate -resistant Palmer, a Liberty-tolerant variety (LL or WRF) is the best option, assuming good management.
- For other fields, where Palmer is not so bad, variety selection should be based on agronomic performance rather than herbicide tolerance per se. RRF, WRF, or LL are all options.
- Carefully study variety performance data. Look at all the data you can find.



Order of Discussion

- Palmer management in RRF cotton
- Palmer management in LL or WRF cotton





GR Palmer Amaranth Control in RR Cotton Southeast US Recommendations

- Aggressive Preplant and/or PRE herbicide program.
Get it PRE or you don't get it. No salvage POST options in RR cotton.



Weak PRE

Powermax + Dual Magnum POST -1

Powermax POST 2



Strong Pre

Powermax + Dual Magnum POST -1

Powermax POST-2

Hedging Against Lack of Timely Rain on PRE Herbicides: Palmer Amaranth in Cotton

- In conventional tillage, incorporate a yellow herbicide.
- In no-till cotton, put residual with preplant burndown.
Paraquat + another residual at planting.



Preplant/PRE herbicides for Palmer amaranth in Cotton

Preplant

PPI

no-till

conv. till

PRE

Valor

Treflan

Cotoran

Diuron + Staple

Diuron

Prowl

Diuron

Reflex + Staple

Reflex

Reflex + Cotoran

Staple

Reflex + diuron

Prowl

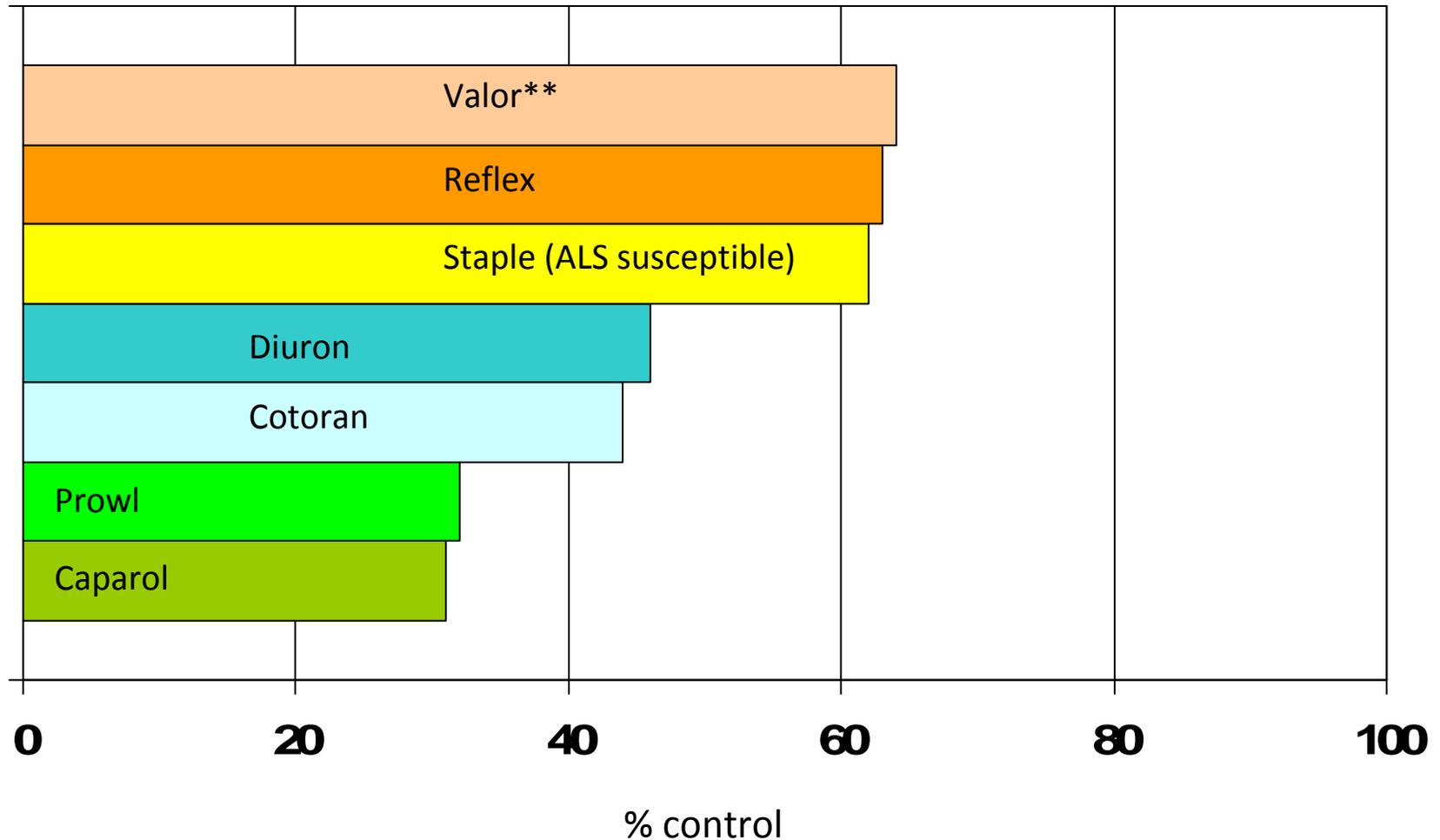
Prowl + Reflex

Prowl + Cotoran

Prowl + diuron

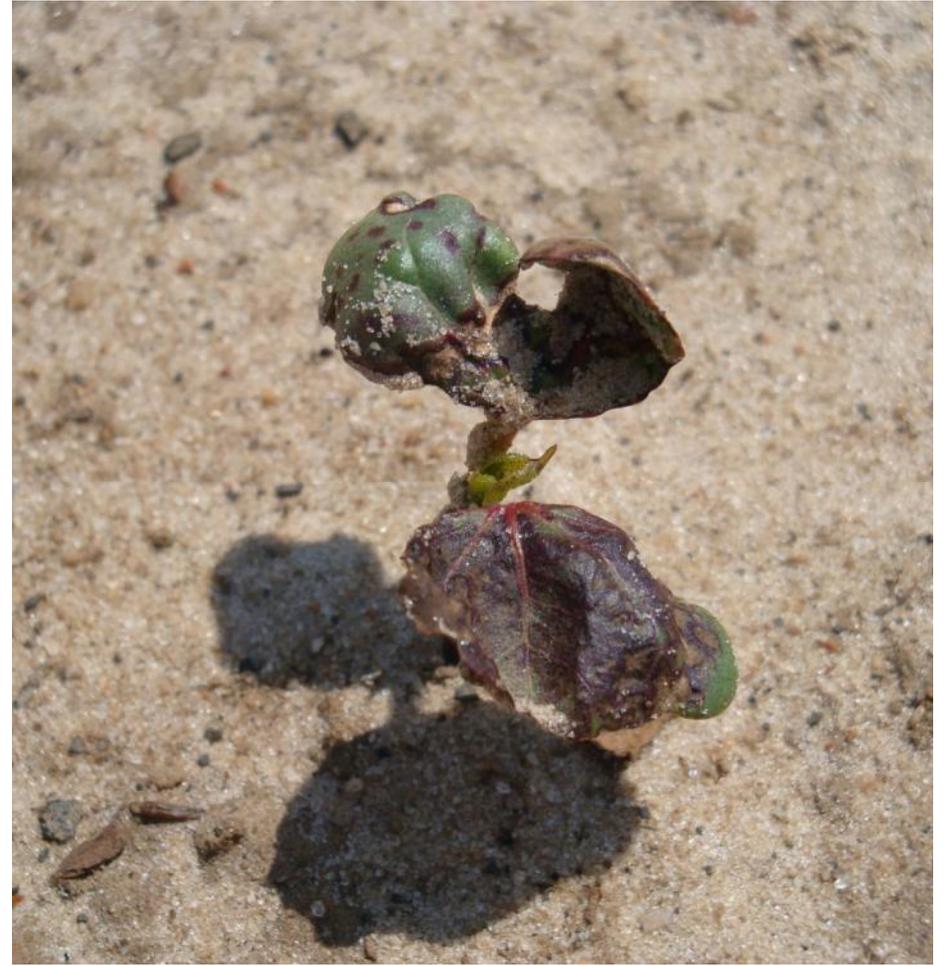


Palmer amaranth control by PRE herbicides; 40 days*



* Average of 5 locations; 2 in GA, 3 in NC. No other herbicides included.

** Applied same time as the PRE herbicides.



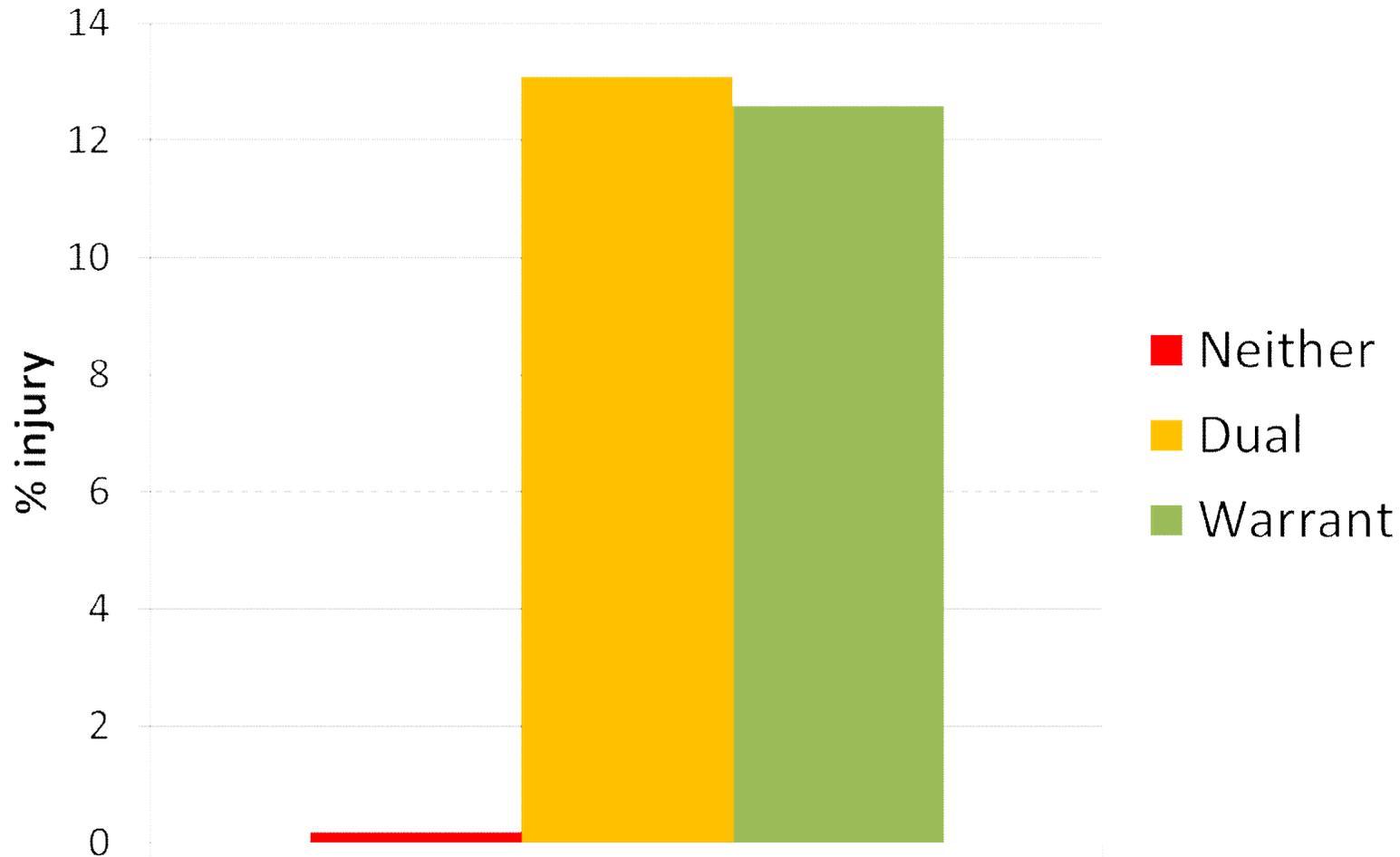
What happened here?



GR Palmer Amaranth Control in RR Cotton Southeast US Recommendations

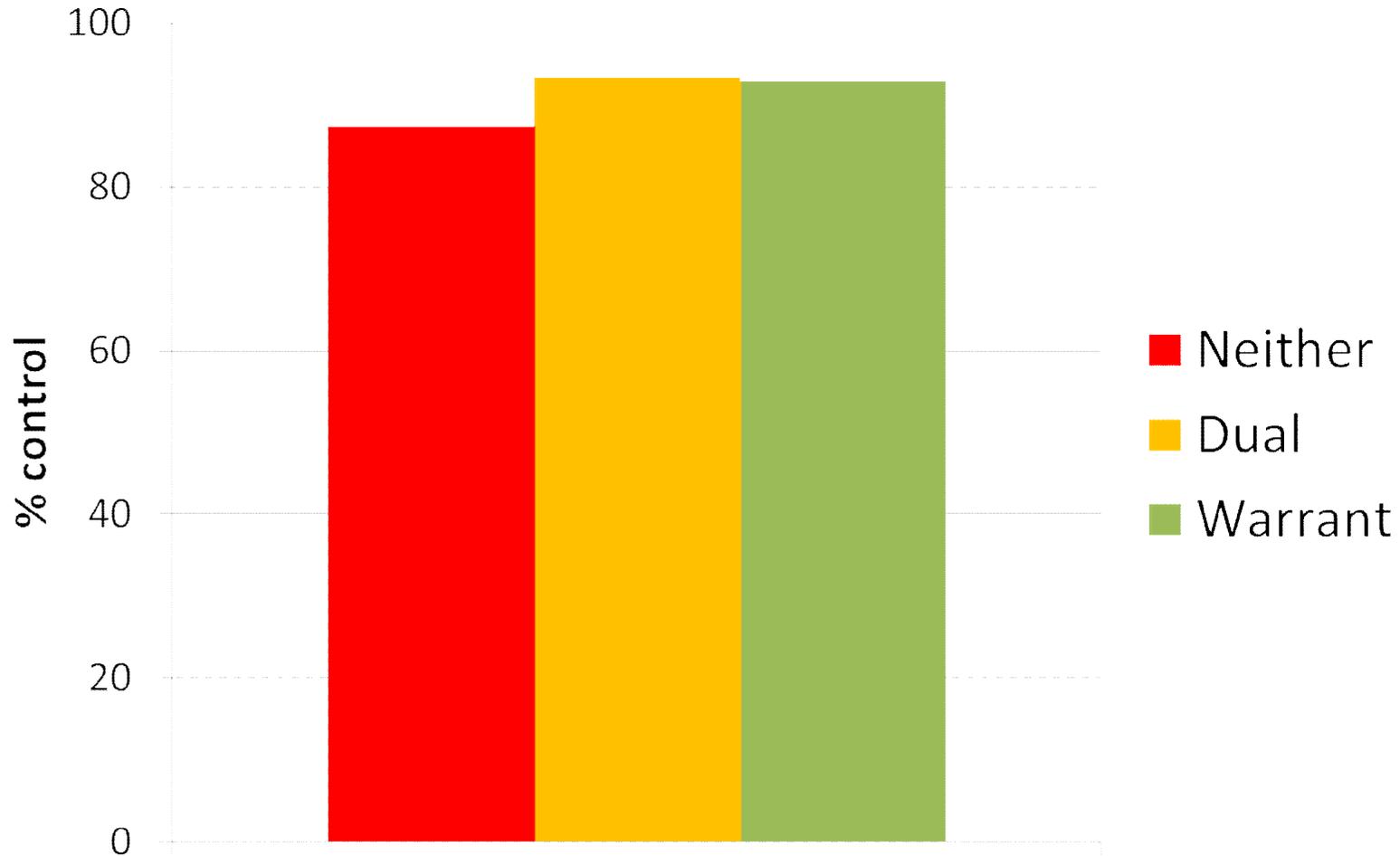
- Aggressive Preplant and/or PRE herbicide program
- Dual Magnum or Warrant early POST

Cotton injury by Dual Magnum vs Warrant POST*. 7-15 days. Avg. 12 trials, 2010-2011.



*Some trials with RRF, some with WRF, some with LL.

Palmer amaranth control by Dual vs Warrant POST*. 15-21 days.** Avg. 12 trials, 2010-2011.



*Some trials with RRF, some with WRF, some with LL.

** Evaluated before the next application.



GR Palmer Amaranth Control in RR Cotton Southeast US Recommendations

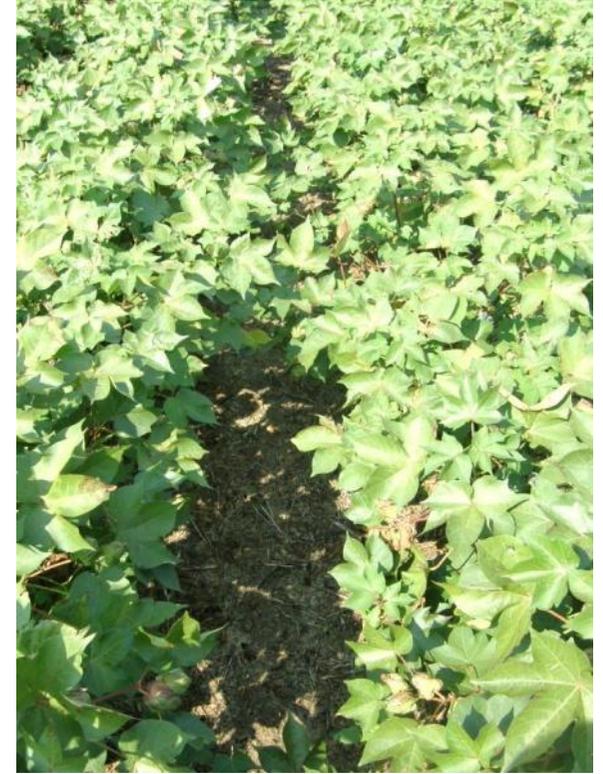
- Avoid cotton in badly infested fields
- Aggressive Preplant and/or PRE herbicide program
- Dual Magnum or Warrant early POST
- Residual lay-by



No
lay-by



Non-residual
lay-by



Residual
lay-by

All plots with three overtop applications of Ignite, no PRE

Residual lay-by options for cotton*

Caparol

Diuron

Suprend

Reflex**

Layby Pro

Valor***

Cotoran



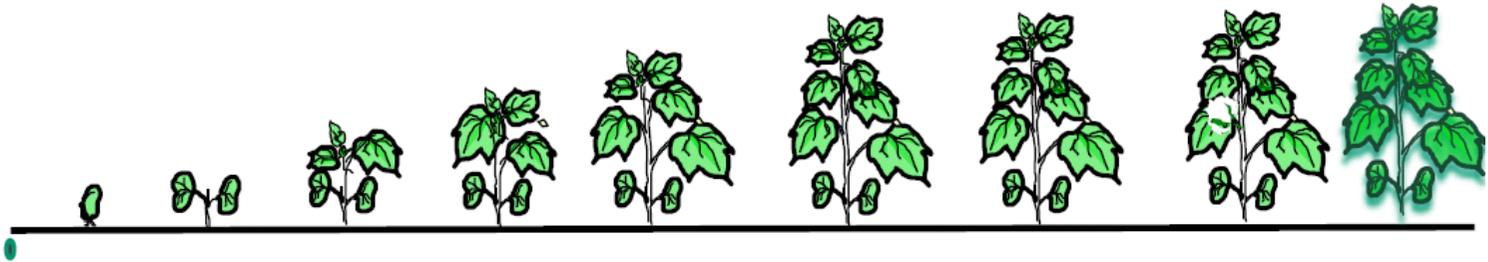
- * Follow height restrictions and rotational restrictions. Mix with MSMA or glyphosate.
- ** Max of 1.5 pt/year from all applications.
- *** Max of 2 oz/year from all applications.



GR Palmer Amaranth Control in RR Cotton Southeast US Recommendations

- Aggressive Preplant and/or PRE herbicide program
- Dual Magnum or Warrant early POST
- Residual lay-by
- Goal is to have overlapping residuals

Overlapping Residuals



Preplant

Preemergence

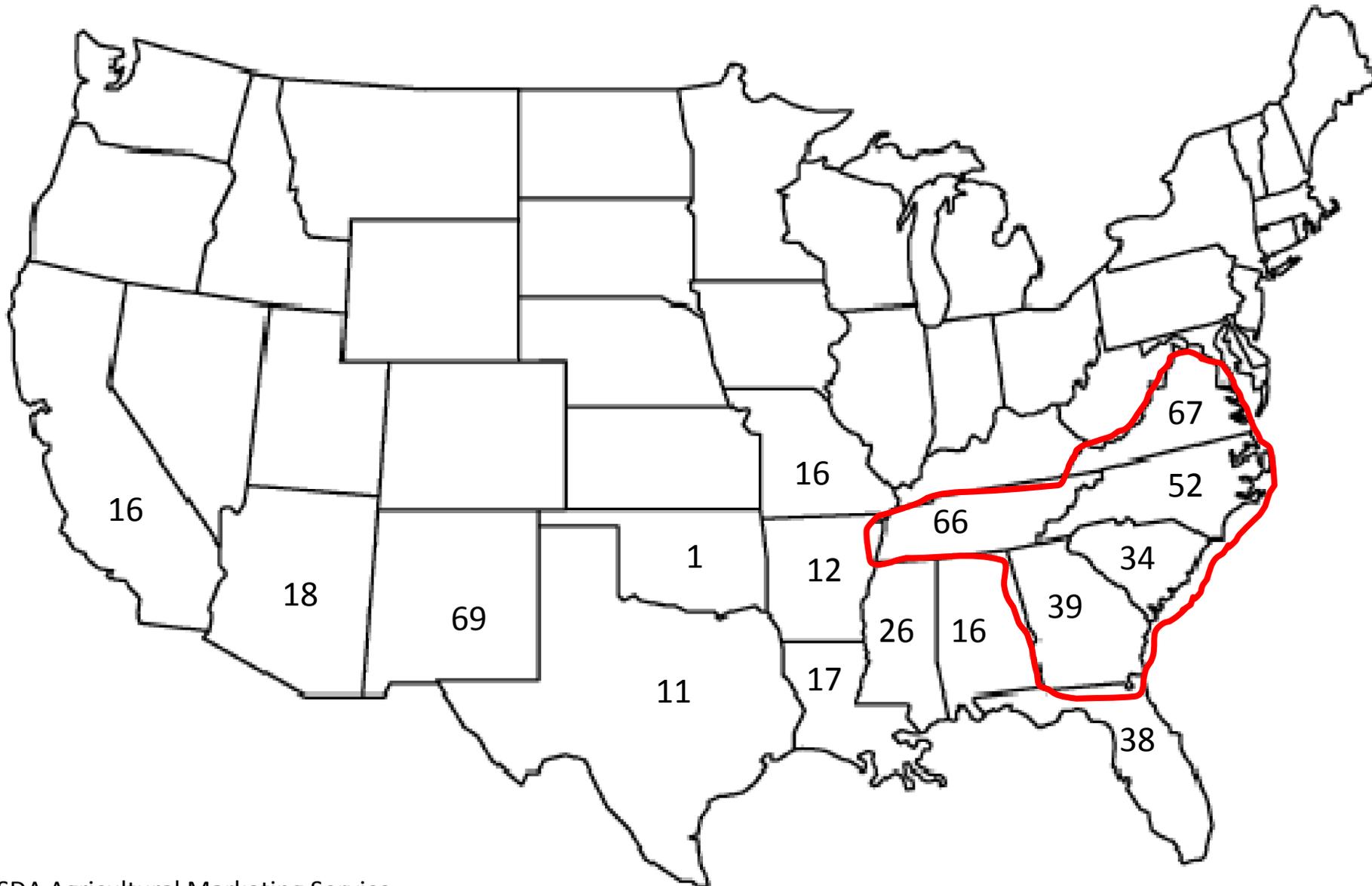
Residual POST

Residual Lay-by

Impacts of Glyphosate-Resistant Weeds

- Return to residual herbicides
PRE, POST overtop, layby
- Return to hooded sprayers
- Hand weeding
- Shift to glufosinate-tolerant varieties
- Less no-till, more cultivation (not in NC)
- Increased costs

Percent of 2011 Cotton Crop Planted to Glufosinate-Tolerant Varieties





Liberty-based programs

- ~ emphases on Palmer
- ~ emphases on resistance management



Palmer Amaranth management with Liberty-based programs

- Aggressive Preplant and/or PRE program
 - Better control
 - More flexibility in timing of first Ignite application

Weed Management in Glufosinate-Tolerant Cotton

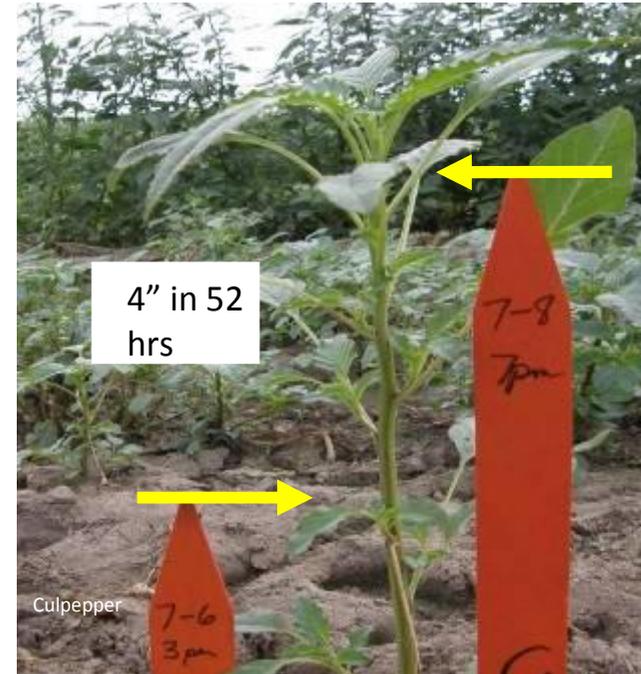


- Timing is critical!! 3 to 4 inches for consistent control of *Amaranthus* species.

Good preplant/PRE program gives some flexibility in timing.

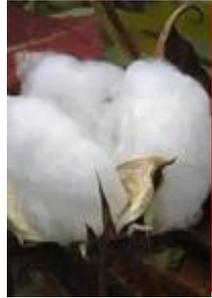
From Ignite 280 label:

Weed Species	Maximum Weed Height or Diameter (Inches)	
	22 oz/A	29 oz/A ^{ab}
Amaranth, Palmer ²	3	4
Pigweed, redroot ²	3	4
Pigweed, prostrate ²	3	4
Pigweed, spiny ²	3	4
Pigweed, smooth ²	3	4
Pigweed, tumble ²	3	4





This is not a 4-
inch pigweed!



Palmer Amaranth management with Ignite-based programs

- Aggressive Preplant and/or PRE program
 - Better control
 - More flexibility in timing of first Ignite application
 - Critical for resistance management

Palmer Amaranth Management Systems in No -Till Glytol/LL

Cotton* % Palmer amaranth control						
PRE	POST 1	POST 2	At time of POST 1	2 wk after POST 2	2 wk after Layby	Late Season
None	Rup	Rup	0	68	63	41
Reflex/Dire	Rup	Rup	98	89	89	86
X						
None	Liberty	Liberty	0	88	91	87
Reflex/Dire	Liberty	Liberty	98	99	99	98

* Data averaged over two locations (Rocky Mt. and Mt. Olive) in 2011.
 All treatments included Roundup + 2,4 -D preplant; Gramoxone at planting;
 Suprend + MSMA layby.

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Palmer Amaranth management with Ignite-based programs

- Avoid cotton in badly infested fields
- Aggressive Preplant and/or PRE program
- Dual Magnum with first POST of Liberty
(Warrant/Liberty mixes not on either label)

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Palmer Amaranth management with Ignite-based programs

- Avoid cotton in badly infested fields
- Aggressive Preplant and/or PRE program
- Dual Magnum with first POST of Ignite
- Residual lay-by



Untreated



Paraquat burndown

Prowl + Reflex PRE

Ignite + Dual Magnum POST 1

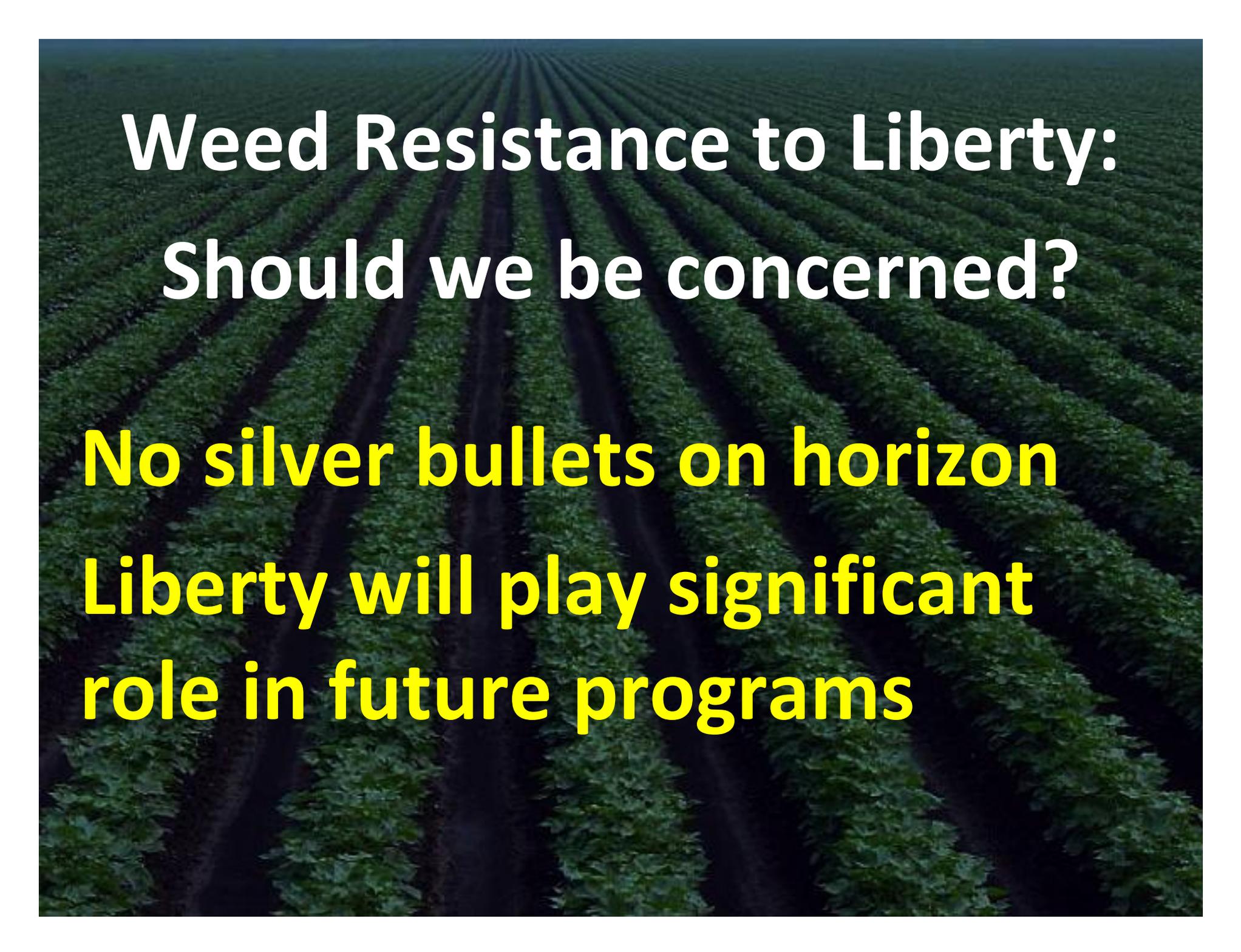
Ignite POST 2

Dlrex + MSMA layby



Weed Resistance to Liberty:

Will it happen?



**Weed Resistance to Liberty:
Should we be concerned?**

**No silver bullets on horizon
Liberty will play significant
role in future programs**

Liberty-Based Weed Management: Use it Wisely



Resistance Management with Liberty:

- Use preplant and/or PRE herbicides
- Use residual layby herbicides
- Consider Dual Magnum POST
- Start clean
- Very timely Liberty application
- Limit to two Liberty applications/year
- Shoot your neighbor if he abuses Liberty

Questions?

