

# What Could Weed Management Programs Look Like in the Future and Weed Control with Current Situation

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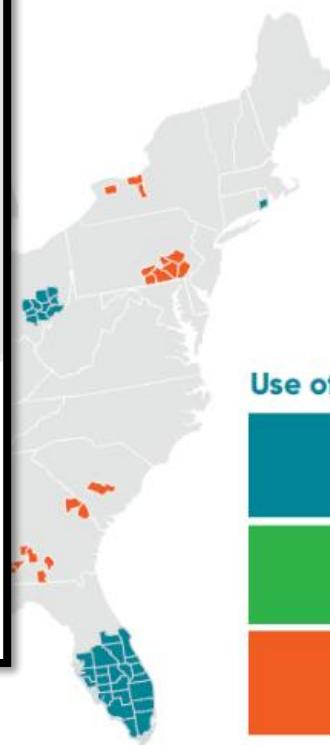
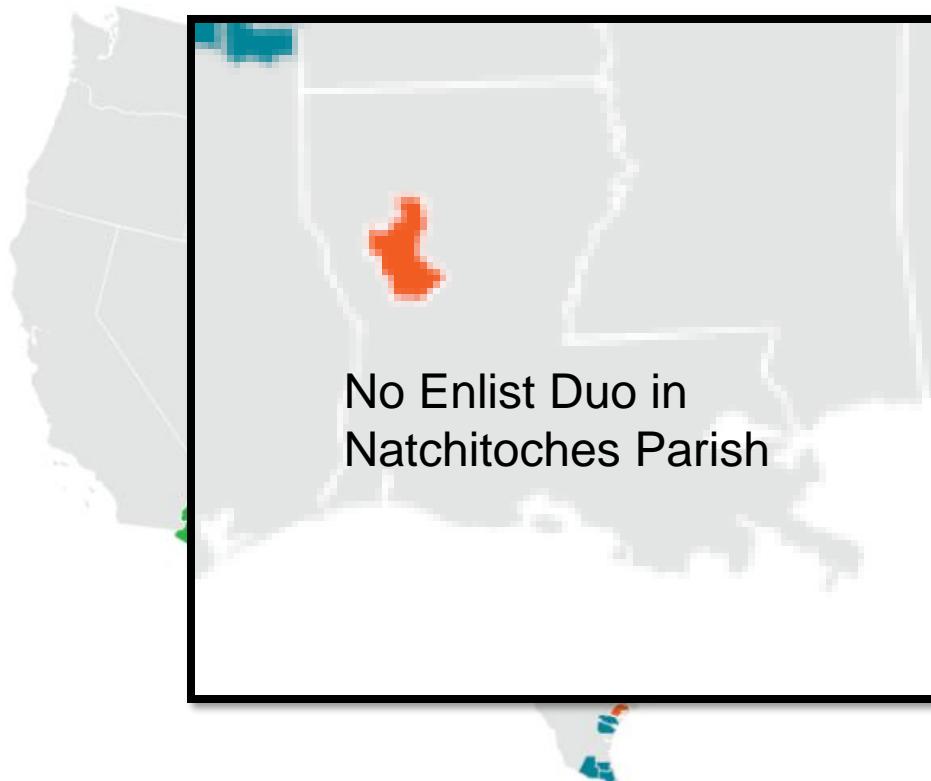
# Future of herbicides

- Future herbicide choices depends upon EPA and ESA
  - Registration of new ones
  - Re-registration of ones previously registered
    - Endangered Species Act
  - Trifludimoxazin
    - Not sold in US, but was registered by the EPA in May 2021
    - Currently topic of lawsuit against EPA
  - Due to ESA, county level restrictions on Enlist Duo and/or Enlist One

# ESA impact on Enlist products

## Enlist One® and Enlist Duo® herbicides county restrictions:

The map and county lists below represent county restrictions found on the federal Enlist One® and Enlist Duo® herbicide registrations as of January 11, 2022.



Enlist One® herbicide (Both products)	Enlist Duo® herbicide
Enlist One® herbicide (Both products in select areas in county)	Enlist Duo® herbicide
Enlist Duo® herbicide (Only)	

# EPA rules, shortages, prices!

- Pesticide labels are changing
  - Engenia, XtendiMax, Tavium, and all paraquat formulation labels MUST be used by a certified applicator only. No more use by someone under supervision of a certified applicator
  - This will most likely become the rule for new registrations and when old AI's are reregistered.
- Glyphosate, glufosinate, atrazine, S-metolachlor, etc. are short.
  - Who knows how long this will continue.
- When demand is present, but supply is short....price goes up.
  - Also, as commodity prices go up, prices oftentimes follow.
- So, farmers need to focus on the fundamentals regardless of what technology used!

# Future?

- There are 6 herbicide-resistance technologies in soybean as of today
  - RR, LL, STS/BOLT, Xtend, XtendFlex, Enlist
  - EPA has approved Enlist Duo and Enlist One for another 7 years
  - The future of dicamba-resistant technology could be squirrelly
- Regardless of the technology used in the future, our growers must practice sound weed science fundamentals.
  - Choose the proper herbicide for the weeds present
  - Application with correct rates
  - Apply to small, actively growing weeds
  - Correct water volume
  - Water quality
  - Apply during favorable weather
  - Proper ground speed to maximize coverage
  - Apply with nozzles 15 to 18 inches above target
- The only way to get a good return on investment is to do things right the first time.

# Could future be one or the other?



OR



Source: J. Bond, MS State

# Burndown



# Ryegrass: herbicide shortage and price increase impacts

- ▶ Paraquat: earlier the better; coverage (15 GPA); two applications; PSII addition (diuron, atrazine, metribuzin)
- ▶ Clethodim/Quizalofop: earlier the better (prior to jointing); 16 oz/A of 2# formulation or equivalent or 12 oz/A minimum; 2,4-D or dicamba antagonism
- ▶ Reviton: not a stand-alone ryegrass material; enhanced speed of activity/performance of clethodim @1 oz; MSO required



# Marestail: herbicide shortage and price increase impacts

- ▶ Dicamba/Elevore: excellent control
- ▶ Paraquat: earlier the better <4"; coverage (15 GPA); PSII addition (diuron, atrazine, metribuzin)
- ▶ 2,4-D: good control, not to level of top 2
- ▶ Reviton: fair/good at 2 oz; benefit from addition of 2,4-D or dicamba at lower rates; MSO required

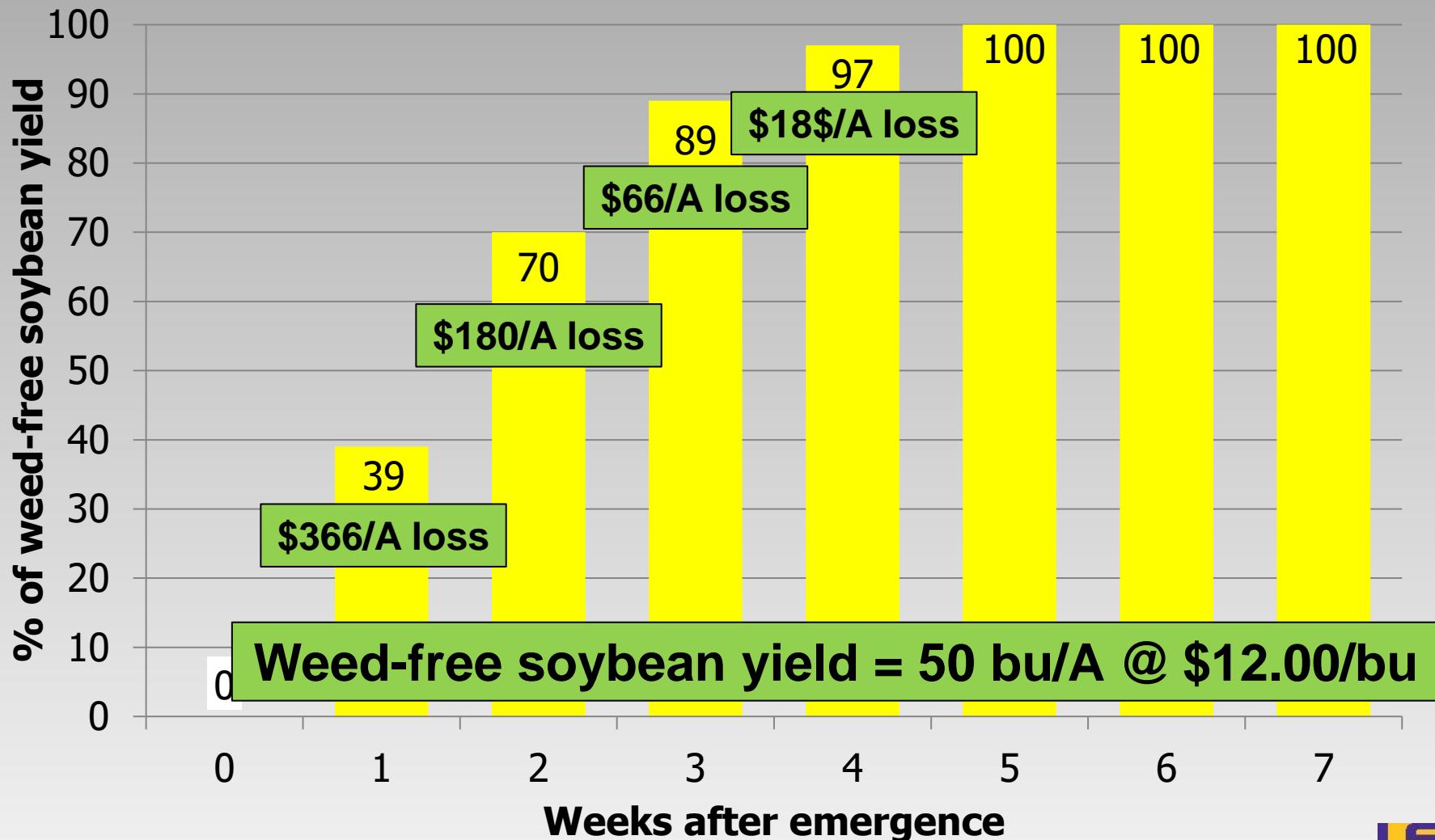


# General: herbicide shortage and price increase impacts

- ▶ Paraquat: PSII addition (diuron, atrazine, metribuzin); great initial/cleanup treatment and residual control
- ▶ Primrose: 2,4-D excellent; dicamba good; Elevore fair
- ▶ Henbit: paraquat, Elevore, Reviton good/excellent (much better in warmer conditions); 2,4-D/dicamba fair/good
- ▶ Swinecress: paraquat poor; 2,4-D/dicamba fair; Reviton good
- ▶ 2,4-D + dicamba: good broad spectrum broadleaf control
- ▶ Need for complete burndown control???: population; species
- ▶ Glyphosate rate: 1 or 0.75 lb ai/A??
- ▶ Residuals and Palmer amaranth

# Early Season Weed Competition

Max yield when soybean kept weed-free for 5 weeks after emergence



# Weed Management



**Take home point:**  
Residual herbicide PRE  
followed by  
Residual + nonselective POST



PRE fb non-selective + residual EPOST



Only non-selective + residual EPOST

# Choice of PRE depends upon weed spectrum

Products	annual grasses	pigweed species	prickly sida	morningglory	smellmelon
Valor	6	9	8	8	7
Dual Magnum	9	9	5	3	7
Boundary	9	9	8	5	8
Canopy	8	9	9	8	7
Envive	7	8	7	8	8
Authority Elite	9	9	9	9	8
Fierce	7	9	8	9	9
Trivence	8	8	8	8	8

# Commonly used AI's for soybean PRE's

Active ingredient	2 AI per product	3 AI per product	Total products
metribuzin	13	6	19
sulfentrazone	10	2	12
flumioxazin	5	6	11
metolachlor	9	0	9
chlorimuron	7	2	9
S-metolachlor	6	3	9
fomesafen	6	1	7
pyroxasulfone	4	1	5
cloransulam	3	0	3
acetochlor	2	0	2
thifensulfuron	0	2	2

# Soybean programs – with and without glyphosate and/or dicamba

Timing	with glyphosate; with dicamba	without glyphosate; with dicamba	Without glyphosate; without dicamba
Burndown	glyphosate + 2,4-D + Select Max	2,4-D + dicamba + clethodim	2,4-D + dicamba + clethodim
Preplant		paraquat + <i>RESIDUAL</i>	paraquat + <i>RESIDUAL</i>
PRE	paraquat + <i>RESIDUAL</i>	paraquat + <i>RESIDUAL</i>	paraquat + <i>RESIDUAL</i>
POST 1	<ul style="list-style-type: none"><li>• glyphosate + Engenia/XtendiMax + Dual/Outlook/Zidua</li><li>• glyphosate + Tavium</li></ul>	<ul style="list-style-type: none"><li>• Engenia + Dual/Outlook/Zidua + Python</li><li>• XtendiMax + Dual/Outlook/Zidua + Reflex</li><li>• Tavium + Reflex</li></ul>	Prefix  Warrant Ultra
POST 2	Glyphosate + Engenia/XtendiMax/Tavium	Select Max OR Assure II	Select Max OR Assure II
POST 3		<ul style="list-style-type: none"><li>• Engenia + Dual/Outlook/Zidua + Assure II</li><li>• XtendiMax + Dual/Outlook/Zidua + Select Max</li><li>• Tavium + Select Max</li></ul>	<ul style="list-style-type: none"><li>• Classic + Dual/Outlook/Zidua</li><li>• Cobra + Dual/Outlook/Zidua</li></ul>

# Soybean programs – Enlist soybean

Timing	with glyphosate; with 2,4-D choline	without glyphosate; with 2,4-D choline
Burndown	glyphosate + 2,4-D + Select Max	2,4-D + dicamba + clethodim
Preplant		paraquat + <i>RESIDUAL</i>
PRE	paraquat + <i>RESIDUAL</i>	paraquat + <i>RESIDUAL</i>
POST 1	<ul style="list-style-type: none"><li>• Enlist Duo + Warrant/Zidua SC</li><li>• glyphosate + Enlist One + Dual/Warrant/Zidua SC</li><li>• glufosinate + Enlist One + Dual/Warrant/Zidua SC</li></ul>	<ul style="list-style-type: none"><li>• Enlist One + Dual/Warrant/Zidua SC</li><li>• glufosinate + Enlist One + Dual/Warrant/Zidua SC</li></ul>
POST 2	<ul style="list-style-type: none"><li>• Enlist Duo + Warrant/Zidua SC</li><li>• glyphosate + Enlist One + Dual/Warrant/Zidua SC</li><li>• glufosinate + Enlist One + Dual/Warrant/Zidua SC</li></ul>	<ul style="list-style-type: none"><li>• Enlist One + Dual/Warrant/Zidua SC</li><li>• glufosinate + Enlist One + Dual/Warrant/Zidua SC</li></ul>
POST 3		<ul style="list-style-type: none"><li>• Select Max or Assure II</li></ul>

# Corn programs – with and without glyphosate and/or atrazine

Timing	with glyphosate; with atrazine	without glyphosate; with atrazine	Without glyphosate; without atrazine
Burndown	glyphosate + 2,4-D	2,4-D + dicamba	2,4-D + dicamba
PRE	<ul style="list-style-type: none"><li>• paraquat + atrazine + <i>S</i>-metolachlor</li><li>• atrazine + Corvus</li></ul>	<ul style="list-style-type: none"><li>• paraquat + atrazine + <i>S</i>-metolachlor</li><li>• paraquat + Lexar EZ</li><li>• paraquat + atrazine + Corvus</li></ul>	<ul style="list-style-type: none"><li>• paraquat + <i>S</i>-metolachlor</li><li>• paraquat + Corvus</li></ul>
POST	<ul style="list-style-type: none"><li>• Glyphosate + atrazine + <i>S</i>-metolachlor</li><li>• Halex GT + atrazine</li><li>• glyphosate + Capreno + atrazine</li></ul>	<ul style="list-style-type: none"><li>• atrazine + Capreno + <i>S</i>-metolachlor</li><li>• atrazine + Callisto + <i>S</i>-metolachlor</li><li>• atrazine + Realm Q + <i>S</i>-metolachlor</li></ul>	<ul style="list-style-type: none"><li>• Capreno</li><li>• Callisto</li><li>• Realm Q</li></ul> <p><i>Weed species dependent</i></p>

***Glufosinate is option if corn is tolerant and available***

# Cotton programs – with and without glyphosate and/or dicamba

<b>Timing</b>	<b>with glyphosate; with dicamba</b>	<b>without glyphosate; with dicamba</b>	<b>Without glyphosate; without dicamba</b>
Burndown	glyphosate + 2,4-D + clethodim	2,4-D + dicamba + clethodim	2,4-D + dicamba + clethodim
Preplant			paraquat + Valor
PRE	paraquat + Cotoran	paraquat + Cotoran	paraquat + Cotoran
POST 1	<ul style="list-style-type: none"><li>• glyphosate + Engenia/XtendiMax + Dual/Warrant</li><li>• glyphosate + Tavium</li><li>• glufosinate + Dual/Warrant</li></ul>	<ul style="list-style-type: none"><li>• Engenia + Dual/Warrant</li><li>• XtendiMax + Dual/Warrant</li><li>• Tavium</li><li>• glufosinate + Dual/Warrant</li></ul>	<ul style="list-style-type: none"><li>• Caporal + Dual/Warrant</li><li>• glufosinate + Dual/Warrant</li></ul>
POST 2	<ul style="list-style-type: none"><li>• glyphosate + Engenia/XtendiMax + Dual/Warrant</li><li>• glyphosate + Tavium</li><li>• glufosinate + Dual/Warrant</li></ul>	<ul style="list-style-type: none"><li>• Engenia + Dual/Warrant</li><li>• XtendiMax + Dual/Warrant</li><li>• Tavium</li><li>• glufosinate + Dual/Warrant</li></ul>	<ul style="list-style-type: none"><li>• Cotoran or diuron + Dual/Warrant</li><li>• glufosinate + Dual/Warrant</li></ul>
POST 3		MSMA + diuron or Valor	MSMA + diuron or Valor

# Cotton programs – Enlist cotton

<b>Timing</b>	<b>with glyphosate; with 2,4-D choline</b>	<b>without glyphosate; with 2,4-D choline</b>
Burndown	glyphosate + 2,4-D + clethodim	2,4-D + dicamba + clethodim
Preplant		paraquat + Valor
PRE	paraquat + Cotoran	paraquat + Cotoran
POST 1	<ul style="list-style-type: none"><li>• Enlist Duo + Warrant</li><li>• glyphosate + Enlist One + Dual/Warrant</li><li>• glufosinate + Enlist One + Dual/Warrant</li></ul>	<ul style="list-style-type: none"><li>• Enlist One + Dual/Warrant</li><li>• glufosinate + Enlist One + Dual/Warrant</li></ul>
POST 2	<ul style="list-style-type: none"><li>• Enlist Duo + Warrant</li><li>• glyphosate + Enlist One + Dual/Warrant</li><li>• glufosinate + Enlist One + Dual/Warrant</li></ul>	<ul style="list-style-type: none"><li>• Enlist One + Dual/Warrant</li><li>• glufosinate + Enlist One + Dual/Warrant</li></ul>
POST 3		MSMA + diuron or Valor

# A way to get glyphosate

- Get your glyphosate in a premix

Active ingredient	Trade name(s)	Manufacturer	Crop labeled
glyphosate + fomesafen	<b>Flexstar GT 3.5</b> ; Battle Star GT*; FomAsate; Agent GT**	Syngenta; Albaugh*; Drexel; Winfield**	Cotton, soybean
glyphosate + <i>S</i> -metolachlor	<b>Sequence</b>	Syngenta	Corn, cotton, soybean
glyphosate + 2,4-D choline	<b>Enlist Duo</b>	Corteva	Enlist cotton and soybean
glyphosate + mesotrione	Callisto GT; Meso Star Plus	Syngenta; Sharda	Corn
glyphosate + mesotrione + metolachlor	Mes-O-Sate	Drexel	Corn
glyphosate + mesotrione + <i>S</i> -metolachlor	<b>Halex GT</b>	Syngenta	Corn
glyphosate + mesotrione + <i>S</i> -metolachlor + bicyclopyrone	<b>Acuron GT</b>	Syngenta	Corn

# Get max impact from glufosinate

- Apply 2 hours after sunrise – 1 hour before sunset
- 15 gpa
- Medium droplet nozzles

Trade names	Manufacturer	LSU AgCenter evaluated?
Liberty	BASF	Yes
Cheetah	Nufarm	Yes
Forfeit	Loveland	Yes
Interline	UPL	Yes
<b>Intermoc (+ S-metolachlor)</b>	UPL	Yes
Surmise, Surmise 5	Albaugh	No
Noventa	BASF	No
Fever	Innictis	No
Refer	Summit	No
Lifeline	UPL	No
Scout	Valent	No
Total	Winfield	No
Cheetah Max (+ fomesafen)	Nufarm	No

# QUESTIONS?

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