

Designing an Effective Weed Management Plan

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Methods of Weed Management

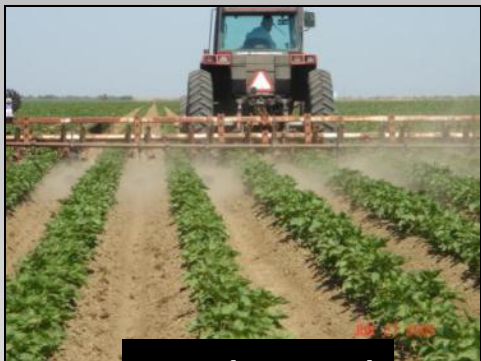
Preventative



3.00% INERT MATTER NET WEIGHT: 15 POUND
1.75% OTHER CROP SEED
0.25% WEED SEED
NOXIOUS WEED SEED:
9 ANNUAL BLUEGRASS PER POUND (0.6 PER OUNCE)



Chemical



Mechanical

Cultural



Chemical Weed Management



26 Sites of Action
69 families



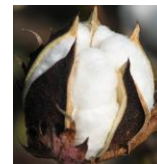
Herbicidal Sites of Action

WSSA/HRAC Code	Site of Action
1	Inhibition of Acetyl CoA Carboxylase
2	Inhibition of Acetolactate Synthase
3	Inhibition of Microtubule Assembly
4	Auxin Mimics
5	Inhibition of Photosynthesis at PSII - Serine 264 Binders
6	Inhibition of Photosynthesis at PSII - Histidine 215 Binders
9	Inhibition of Enolpyruvyl Shikimate Phosphate Synthase
10	Inhibition of Glutamine Synthetase
12	Inhibition of Phytoene Desaturase
13	Inhibition of Deoxy-D-Xyulose Phosphate Synthase
14	Inhibition of Protoporphyrinogen Oxidase
15	Inhibition of Very Long-Chain Fatty Acid Synthesis
18	Inhibition of Dihydropteroate Synthase
19	Auxin Transport Inhibitor
22	PS I Electron Diversion
23	Inhibition of Microtubule Organization
24	Uncouplers
27	Inhibition of Hydroxyphenyl Pyruvate Dioxygenase
28	Inhibition of Dihydroorotate Dehydrogenase
29	Inhibition of Cellulose Synthesis
30	Inhibition of Fatty Acid Thioesterase
31	Inhibition of Serine-Threonine Protein Phosphatase
32	Inhibition of Solanesyl Diphosphate Synthase
33	Inhibition of Homogentisate Solanesyltransferase
34	Inhibition of Lycopene Cyclase
0	Unknown

Herbicidal Sites of Action

WSSA/HRAC Code	Site of Action	Corn	Cotton	Soybean
1	Inhibition of Acetyl CoA Carboxylase		X	X
2	Inhibition of Acetolactate Synthase	X	X	X
3	Inhibition of Microtubule Assembly	X	X	X
4	Auxin Mimics	X	X	X
5	Inhibition of Photosynthesis at PSII - Serine 264 Binders	X	X	X
6	Inhibition of Photosynthesis at PSII - Histidine 215 Binders	X		X
9	Inhibition of Enolpyruvyl Shikimate Phosphate Synthase	X	X	X
10	Inhibition of Glutamine Synthetase	X	X	X
13	Inhibition of Deoxy-D-Xyulose Phosphate Synthase		X	X
14	Inhibition of Protoporphyrinogen Oxidase	X	X	X
15	Inhibition of Very Long-Chain Fatty Acid Synthesis	X	X	X
22	PS I Electron Diversion	X	X	X

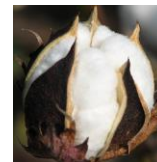
1 clethodim, Assure II



2 Classic, FirstRate, Python, LeadOff



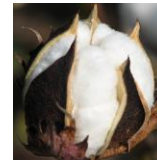
4 2,4-D, dicamba



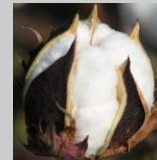
5 atrazine, metribuzin



9 glyphosate



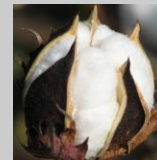
10 glufosinate



14 Ultra Blazer, Reflex, Valor, Sharpen, Aim, Spartan



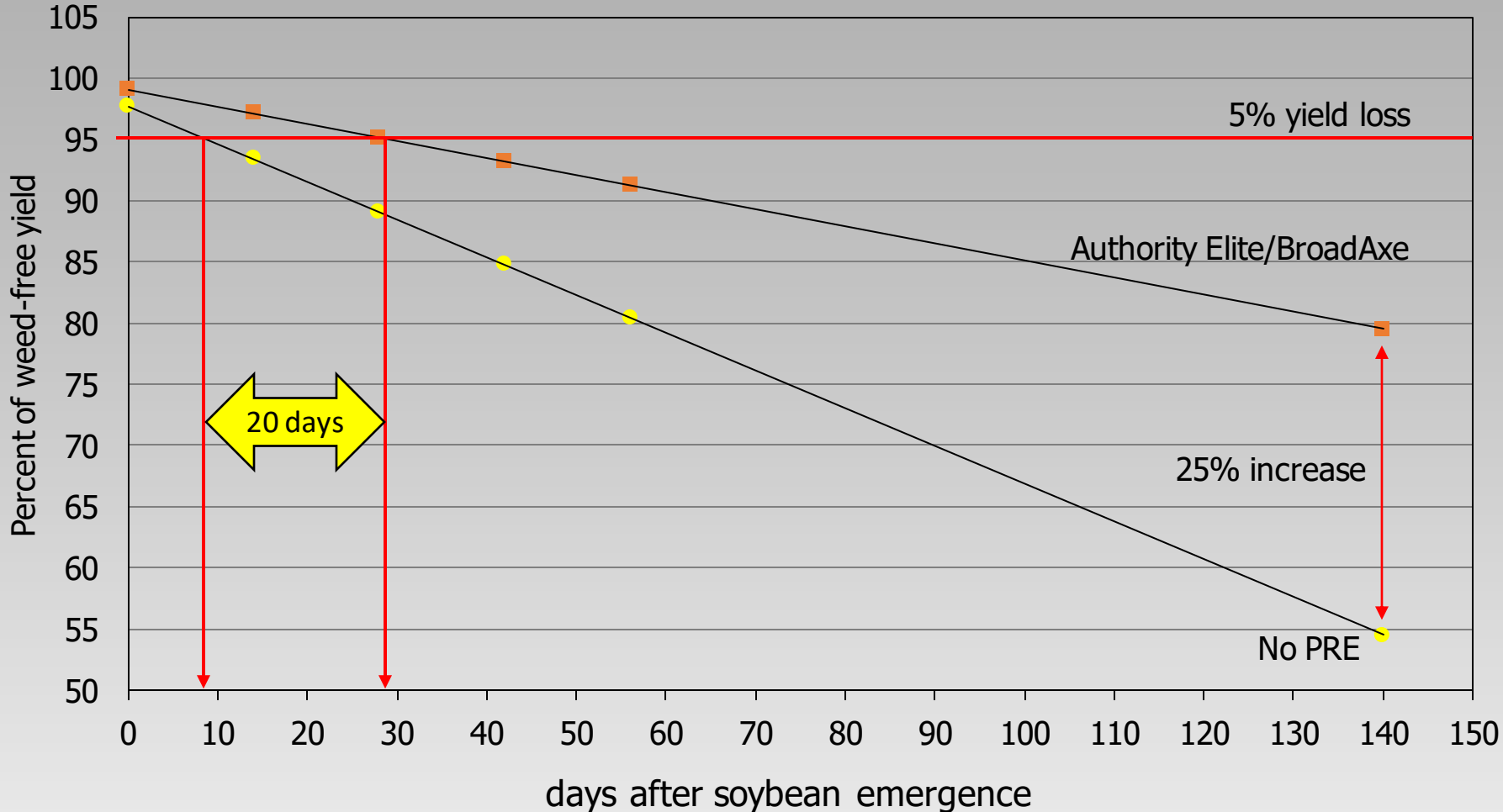
15 Zidua, Warrant, Outlook, metolachlor, S-metolachlor



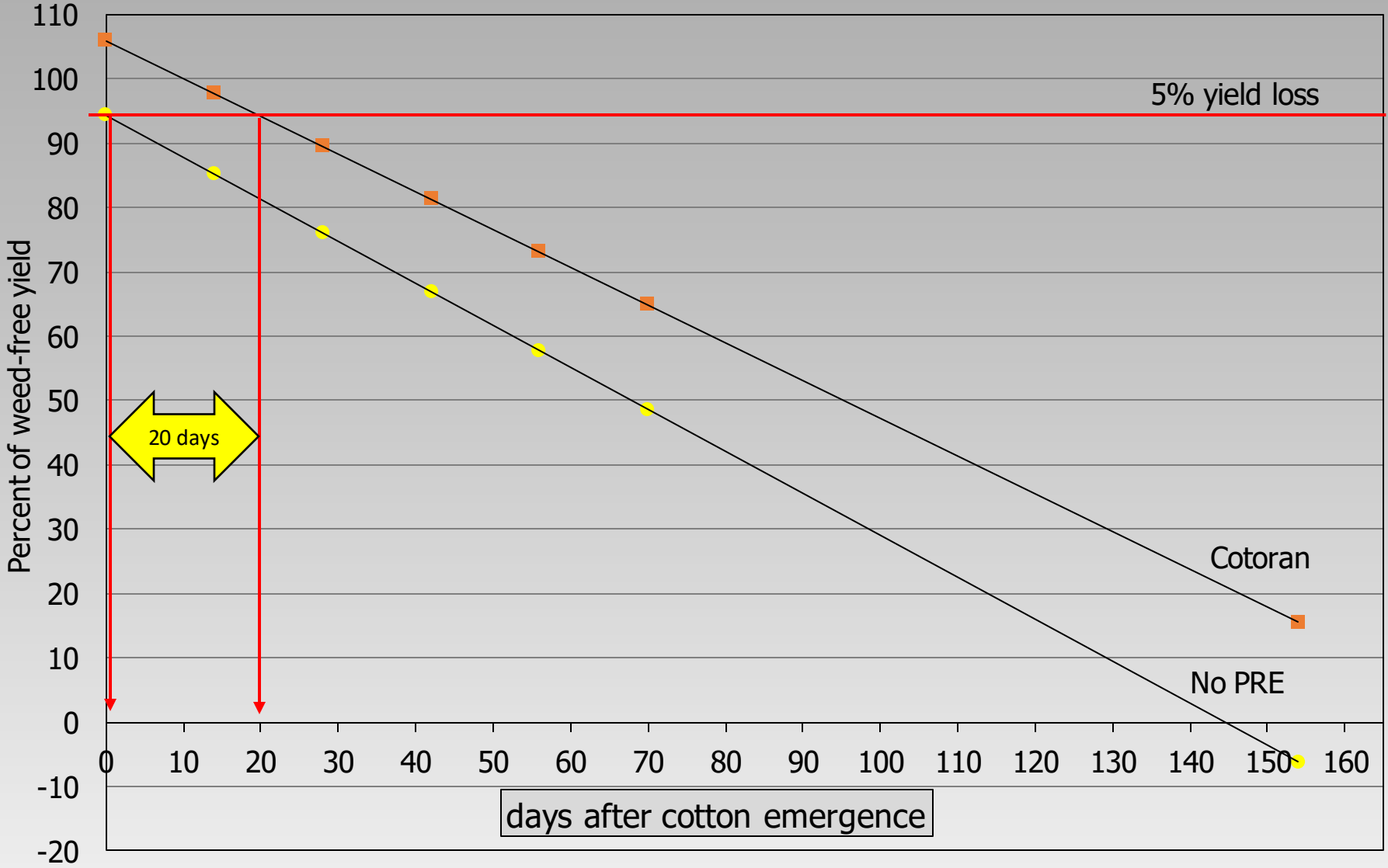
Weed Management



Effect of PRE herbicide in soybean



Effect of PRE herbicide in cotton



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

2 AI's per product for soybean PRE

Active ingredients	Trade name(s)	Manufacturer
acetochlor + fomesafen	Warrant Ultra ; Forrest	Bayer; Sharda
chlorimuron + flumioxazin	Valor XLT	Valent
flumioxazin + pyroxasulfone	Fierce; Fierce EZ	Valent
fomesafen + metolachlor	Vise; Vice; Sharp	ADAMA; Innvictis; Sharda
fomesafen + <i>S</i> -metolachlor	Prefix	Syngenta
metribuzin + chlorimuron	Canopy , Cloak, Metrixx Plus	Corteva; Nufarm; Sharda
metribuzin + flumioxazin	Panther MTZ; Dimetric Charged	Nufarm; Winfield
metribuzin + metolachlor	Tailwind; Priority MTZ; Me-too-lachlor MTZ; Galvan; Headwin*	ADAMA; Albaugh, Drexel, Innvictis; Sharda*
metribuzin + <i>S</i> -metolachlor	Boundary ; Moccasin MTZ*	Syngenta; UPL
metribuzin + sulfentrazone	Authority MTZ	FMC
sulfentrazone + pyroxasulfone	Authority Edge; Authority Supreme*	FMC
sulfentrazone + cloransulam	Authority First ; Vandal First; Antares Prime*	FMC; Innvictis; Helana*
sulfentrazone + metolachlor	Vandal MOC	Innvictis
sulfentrazone + <i>S</i> -metochlor	Authority Elite; BroadAxe XC ; Vandal S-MOC	FMC; Syngenta; Innvictis
sulfentrazone + chlorimuron	Authority XL; Authority Maxx* ; Vandal XL	FMC; Innvictis

3 AI's per product for soybean PRE

Active ingredients	Trade name(s)	Manufacturer
chlorimuron + flumioxazin + pyroxasulfone	Fierce XLT	Valent
chlorimuron + flumioxazin + thifensulfuron	Envive; Enlite*	Corteva
flumioxazin + pyroxasulfone + metribuzin	Kyber; Fierce MTZ	Corteva; Valent
fomesafen + metribuzin + <i>S</i> -metolachlor	Intimidator	Loveland
metribuzin + chlorimuron + flumioxazin	Trivence	Corteva
<i>S</i> -metolachlor + sulfentrazone + metribuzin	Antares Complete; Tribal*	Helena; Loveland*

Historically used PRE AI's in soybean

Active ingredient	WSSA/HRAC #	2 AI per product	3 AI per product	Total products
metribuzin	5	13	6	19
sulfentrazone	14	10	2	12
flumioxazin	14	5	6	11
metolachlor	15	9	0	9
chlorimuron	2	7	2	9
S-metolachlor	15	6	3	9
fomesafen	14	6	1	7
pyroxasulfone	15	4	1	5
cloransulam	2	3	0	3
acetochlor	15	2	0	2
thifensulfuron	2	0	2	2

Trade names aren't always equal

- **Boundary and Moccasin MTZ**
 - S-metolachlor + metribuzin
 - Boundary – 5.25 + 1.25 lb/gal
 - Moccasin MTZ – 3.35 + 1.116 lb/gal

Herbicide Trade Name	Rate	Dual Magnum	Metribuzin 75 DF
	pt/A	----- oz/A -----	
Boundary	1.5	16.5	5
Moccasin MTZ	1.5	10.6	4.5
Boundary	2	22.1	6.67
Moccasin MTZ	2	14.1	6

Effective weed management program

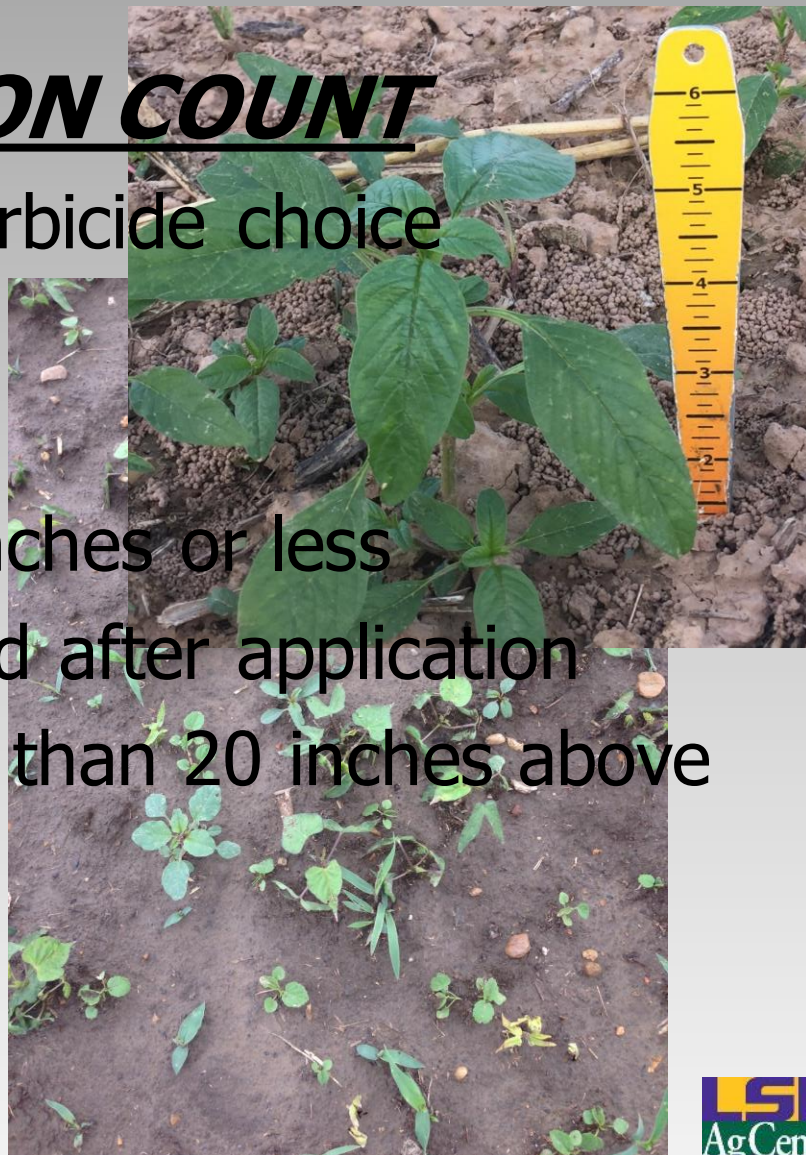
- Herbicide resistant weeds has shown the requirement for
 - Multiple SoA's per application and per season
 - Use of residuals is a must
 - No tolerance for escapes



Effective weed management program

- **MAKE THE APPLICATION COUNT**

- Weed spectrum dictates herbicide choice
- Correct herbicide rate
- Proper GPA
- Apply to small weeds – 4 inches or less
- Apply when weather is good after application
- Nozzles should be no more than 20 inches above target



Effective weed management program



Take home point:

Residual herbicide PRE
followed by

Residual + nonselective POST



Questions

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