Glyphosate Resistance Strategies and Management Recommendations for Problem Weeds

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Is there a difference between

"Problem Weed Management"

and

"Resistance Weed Management"?

Problem Weed Management

Improve the level and consistency of control

examples

spray smaller weeds

use a higher herbicide rate

use sequential applications or tank mixtures

add other practices (e.g. cultivation)

Resistance Weed Management

Reduce the selection intensity for herbicide resistant weed biotypes

examples

spray fewer weeds

rotate among herbicide modes of action

use other practices (e.g. cultivation)

Some practices improve both problem weed management and resistance weed management

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What does each program provide?

- improved control?
- reduced selection intensity?

Corn	Soybean	Corn	Soybean
glyphosate	glyphosate	glyphosate	glyphosate
glyph+glyph	glyph+glyph	glyph+glyph	glyph+glyph
pre+glyph	glyph	pre+glyph	glyph
pre+glyph	pre+glyph	pre+glyph	pre+glyph
pre+post	pre+glyph	pre+post	pre+glyph

Glyphosate Resistance Management

Reactive – use glyphosate until resistance develops and then spend extra dollars to control the resistant weed (e.g. tank mixture)

Proactive – use more costly management practice to delay herbicide resistance

Pay Now or Pay Later?

Tom Mueller (UT), Paul Mitchell (UW), Bryan Young (SIU), and Stan Culpepper (UG). 2005. *Proactive versus reactive management of glyphosate-resistant or -tolerant weeds*. Weed Technology 19:924-933.

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When will proactive management pay?

		Added cost for proactive management				
		$2/a				$10/a
Added cost to control glyphosate-resistant weed	$2.50/a	?				?
	$20/a	?				

(assumes a discount rate of 8%)

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When will proactive management pay?

		Added cost for proactive management				
		$2/a				$10/a
Added cost to control glyphosate-resistant weed	$2.50/a	?				**Never**
	$20/a	?				

(assumes a discount rate of 8%)

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When will proactive management pay?

		Added cost for proactive management				
		$2/a				$10/a
Added cost to control glyphosate-resistant weed	$2.50/a	**Very soon**				Never
	$20/a	?				

(assumes a discount rate of 8%)

UW Extension

When will proactive management pay?

		Added cost for proactive management				
		$2/a				$10/a
Added cost to control glyphosate-resistant weed	$2.50/a	Very soon				Never
	$20/a	Long time				

(assumes a discount rate of 8%)

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Proactive management pays if resistance occurs before the time listed

		Added cost for proactive management				
		$2/a	$4/a	$6/a	$8/a	$10/a
Added cost to control glyphosate-resistant weed	$2.50/a	3 yr	-	-	-	-
	$5/a	11 yr	3 yr	-	-	-
	$10/a	20 yr	11 yr	6 yr	3 yr	-
	$20/a	29 yr	20 yr	15 yr	11 yr	9 yr

(assumes a discount rate of 8%)

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Proactive Resistance Management

1. Do some weeds have the potential to be expensive to control if glyphosate-resistance develops?

2. Are there management programs that are proactive at a moderate cost?

Waterhemp

Assume ALS resistance

Pre soybean herbicides

Sencor, Valor, Prowl, Intrro, Boundary

Post soybean herbicides

Cobra/Phoenix, Flexstar, Ultra Blazer

Good alternative herbicides in corn

Common Lambsquarters

Post soybean herbicide – Harmony GT

Pre soybean herbicides

Sencor, Valor, Prowl, Boundary

Good alternative herbicides in corn

Horseweed

Tank mix 2,4-D with glyphosate

Rotate with Gramoxone

Giant Ragweed

Corn – 2 pass program

Pre programs in corn – base

atrazine (atrazine premixtures), Hornet, Camix, Lumax

Numerous good post programs

Soybean

FirstRate (ALS resistance)

Post herbicides

Cobra, Flexstar, Ultra Blazer