The utility of preemergence herbicides without adequate rainfall in spring 2012

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2012, Challenging season in review

- April: **Early Spring Creates Early Weed Pressure Concerns**
  - http://ipcm.wisc.edu/blog/2012/04/early-spring-creates-early-weed-pressure-concerns/
- June: **Weeds could be Tough to Control with POST Herbicides this Year**
  - http://ipcm.wisc.edu/blog/2012/06/weeds-could-be-tough-to-control-with-post-herbicides-this-year/
- June: **Dry conditions continue to persist in Southern WI: Poor Early Weed Control is Evident**
  - http://ipcm.wisc.edu/blog/2012/06/dry-conditions-continue-to-persist-in-southern-wi-poor-early-weed-control-is-evident/

The value of early-season weed control (residual herbicides) in 2012 ……?

- Droughty conditions prevented good soil-residual herbicide 'activation'
  - Residual herbicides need rainfall or mechanical incorporation (preferably into moist soil)
- In general, soil-applied residual herbicides did not work well in spring 2012
- Now, we're worried about carryover and damage in 2013 crops…..
- Should we still be 'pushing' residual herbicide use?

The value of early-season weed control (residual herbicides) in 2012

- Early-season soil moisture was valuable, and crops suffered from moisture loss due to early-season weed competition
- Prolonged hot, dry conditions challenged the efficacy of POST herbicide control, including glyphosate
- Ultimately making poor control from soil-applied herbicides better than no control
- Still important for Integrated Strategies to prevent glyphosate resistance!

Dry, hot, dusty POST spray conditions in 2012

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April, May, and June Rainfall data from Arlington Agriculture Research Farm, 2012

Rainfall events starting April 1, 2012	Rainfall amount (inch)
April 14 & 15	0.7
April 19 & 20	1.5
April 25 & 26	3.8
April 28 thru May 1	1.0
May 3 thru May 8	1.8
May 10	0.5
May 24	0.2
May 26	0.4
May 28	0.2
June 12	0.1
June 21	0.1

Started planting

Total: 1 inch

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The value of early-season weed control (residual herbicides) in 2012

Will share primarily yield results from

- Two corn studies
- Three soybean studies

The value of early-season weed control in 2012 (No-till corn efficacy study)

- Efficacy trial from Arlington
- Sprayed EPP's on 4/24/12
  - Received 4.7" rainfall
  - Planted corn 5/11/12
  - Sprayed POST on 6/21/12
- Will show efficacy ratings from time of POST
  - All EPP's were sprayed with a POST of glyphosate (same as POST gly treatment)
    - All glyphosate applications contained AMS at 2.5 lb/a

Value of early-season weed control 2012

Treatment	Rate			Giant foxtail	Yellow foxtail	Lambs-quarters	Velvet-leaf	Common ragweed	Yield
Rup PowerMax	22	fl oz/a	POST	0 e	0 c	0 c	0 b	0 c	36
2,4-D LVE	1	pt/a	PRE	61 c	47 ab	89 ab	95 a	68 ab	192
Rup PowerMax	22	fl oz/a	PRE						
Activator 90	0.25	% v/v	PRE						
Fierce	3	oz/a	PRE	84 a	85 a	94 ab	88 a	66 ab	205
Rup PowerMax	22	fl oz/a	PRE						
Fierce	3	oz/a	PRE	94 a	88 a	97 a	98 a	94 a	215
Princep Caliber 90	1	lb ai/a	PRE						
Rup PowerMax	22	fl oz/a	PRE						
Verdict	15	fl oz/a	PRE	71 b	79 a	90 ab	99 a	85 a	208
Rup PowerMax	22	fl oz/a	PRE						
MSO	1	% v/v	PRE						

Value of early-season weed control 2012 cont…

Treatment	Rate			Giant foxtail	Yellow foxtail	Lambs-quarters	Velvet-leaf	Common ragweed	Yield
Rup PowerMax	22	fl oz/a	POST	0 e	0 c	0 c	0 b	0 c	36
2,4-D LVE	1	pt/a	PRE	61 c	47 ab	89 ab	95 a	68 ab	192
Rup PowerMax	22	fl oz/a	PRE						
Activator 90	0.25	% v/v	PRE				Treatments Repeated		
Sharpen	2.5	fl oz/a	PRE	48 d	31 bc	98 a	97 a	84 a	210
Rup PowerMax	22	fl oz/a	PRE						
MSO	1	% v/v	PRE						
Sharpen	2.5	fl oz/a	PRE	48 d	70 a	93 ab	98 a	85 a	200
Rup PowerMax	22	fl oz/a	PRE						
2,4-D LVE	1	pt/a	PRE						
Activator 90	0.25	% v/v	PRE						
Valor	2	oz/a	PRE	85 a	73 a	83 b	98 a	48 b	207
Rup PowerMax	22	fl oz/a	PRE						

The value of early-season weed control in 2012 (No-till efficacy study)

- EPP's with residual activity average yield = 208 bpa
- EPP burndown (no residual) fb POST glyphosate = 192 bpa ***(16 bpa difference)***

- ADDITIONAL cost ~ $15-20/acre
- ROI:
  - 16 bpa
  - Better glyphosate resistance management

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The value of early-season weed control in 2012 (BASF corn study)

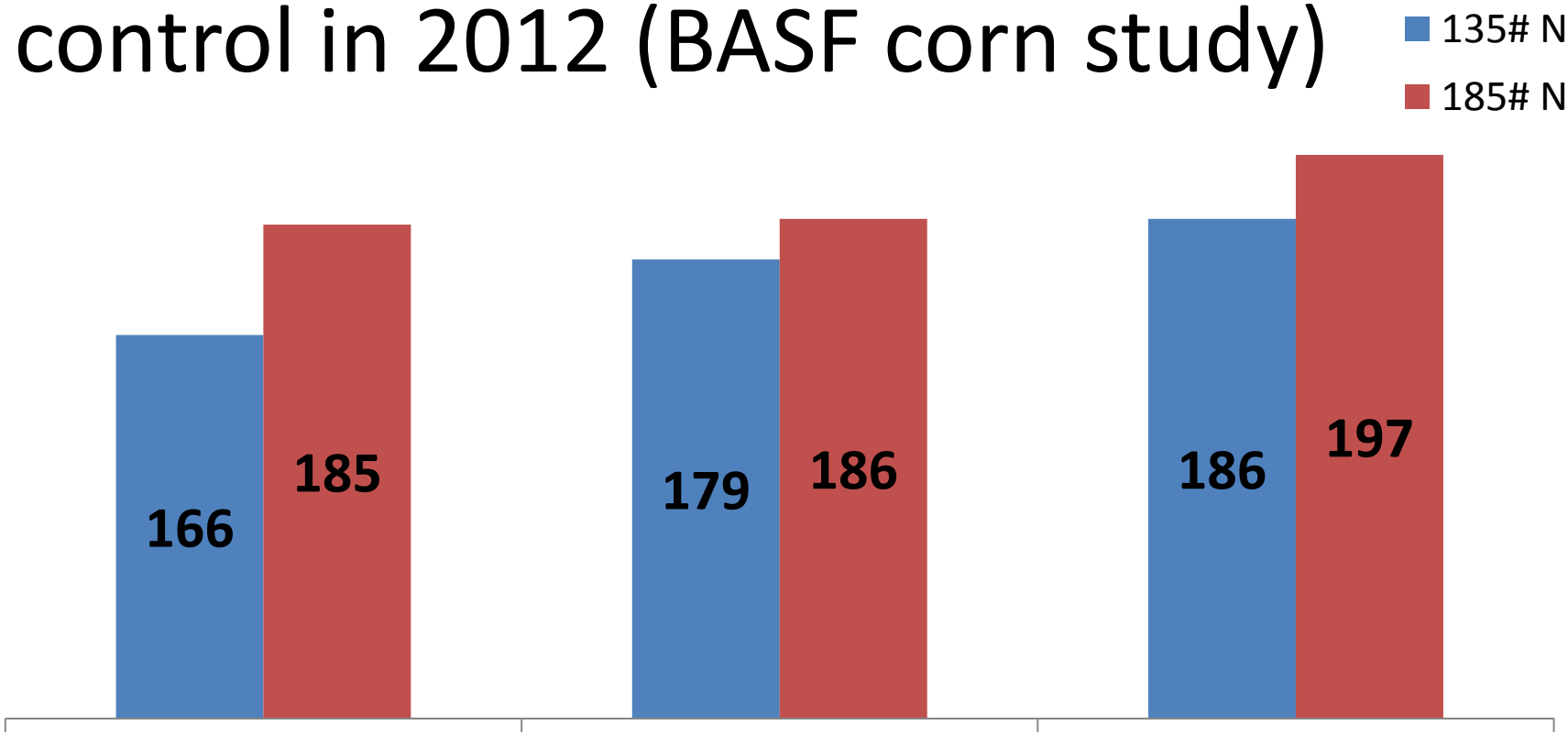
- Corn yield by Input trial from Arlington (Tilled)
  - Main weed species: common ragweed, common lambsquarters, velvetleaf, giant foxtail, and fall panicum
- Planted corn 5/11/12
  - 32,000 seeds/acre
- Sprayed POST on 6/22/12
- Split-plot with 6 subplots, (12 trts total) 6 reps
  - Subplots were 10’ x 65’ plots
  - Whole plots were 135# N or 185# N
  - Subplots were levels of pest management

The value of early-season weed control in 2012 (BASF corn study)

- Subplots were levels of pest management
  1. POST Roundup WeatherMax (RWM) 22 fl oz. @V7
  2. PRE Outlook (20 fl oz.) fb RWM
  3. PRE Verdict (15 fl oz.) fb RWM
  4. PRE Verdict (15 fl oz.) fb RWM fb Headline AMP (10 fl oz.) @R1
  5. PRE Verdict (15 fl oz.) fb RWM+Priaxor (4 fl oz.) fb Headline AMP (10 fl oz.) @R1
  6. PRE Verdict (15 fl oz.) fb RWM fb Headline (6 fl oz.) at V10 fb Headline AMP (10 fl oz.) @R1

  – All RWM applications contained AMS at 17 lb/100gal

The value of early-season weed control in 2012 (BASF corn study)



135# N	**+ 13**	**+ 20**
185# N	**+1**	**+12**

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The value of early-season weed control in 2012 (Syngenta soybean study)

- Soybean yield by Input trial from Arlington (Tilled)
  - Main weed species: common ragweed, common lambsquarters, velvetleaf, smartweed, and giant foxtail
- Planted 5/14/12
  - 143,000 seeds/acre, 30 inch rows
- Split-plot with 6 subplots, (12 trts total) 4 reps
  - Subplots were 20’ x 100’ plots
  - Whole plots were:
    - Residual herbicide fb glyphosate vs. 2 pass glyphosate
  - Subplots were levels of input including nested combinations of different varieties, seed treatments, fungicides, and insecticides

The value of early-season weed control in 2012 (Syngenta soybean study)

Levels of whole-plot treatments:

- Boundary 1.5 pt/acre sprayed PRE 5/17/12

  (FB) Touchdown Total 24 fl oz./acre POST 6/21/12 (V3)

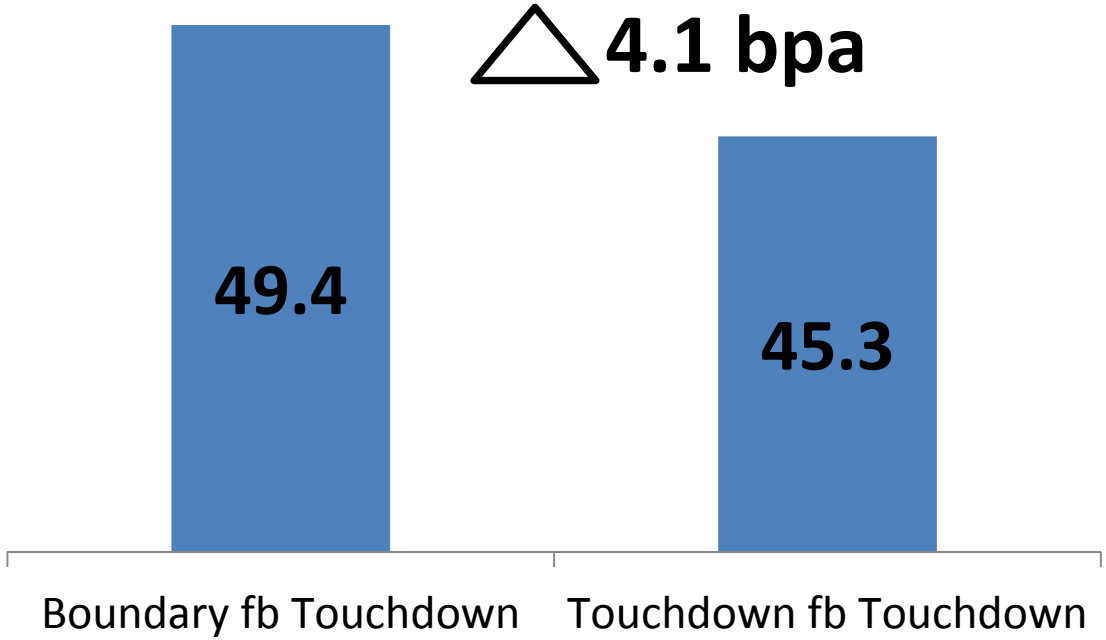
  Vs.

- Touchdown Total 24 fl oz./acre POST 6/15/12 (V2)

  (FB) Touchdown Total 24 fl oz./acre POST 7/6/12 (V7)

*All Touchdown Total had 8.5 lb/100 gal AMS

The value of early-season weed control in 2012 (Syngenta soybean study)



~ $6-10/acre additional cost

ROI:

- **4.1 bpa**
- **Better glyphosate resistance management**

The value of residual herbicides in early-planted and low seeding rate soybean systems

- M.S. student Ryan DeWerff (1st year results)
  - Question 1: Is the value of a residual herbicide in soybean greater with earlier planting dates?
  - Question 2: What is the value of residual herbicide in relation to extra soybean plants (higher seeding rates)

Thanks for funding from the Wisconsin Soybean Marketing Board!

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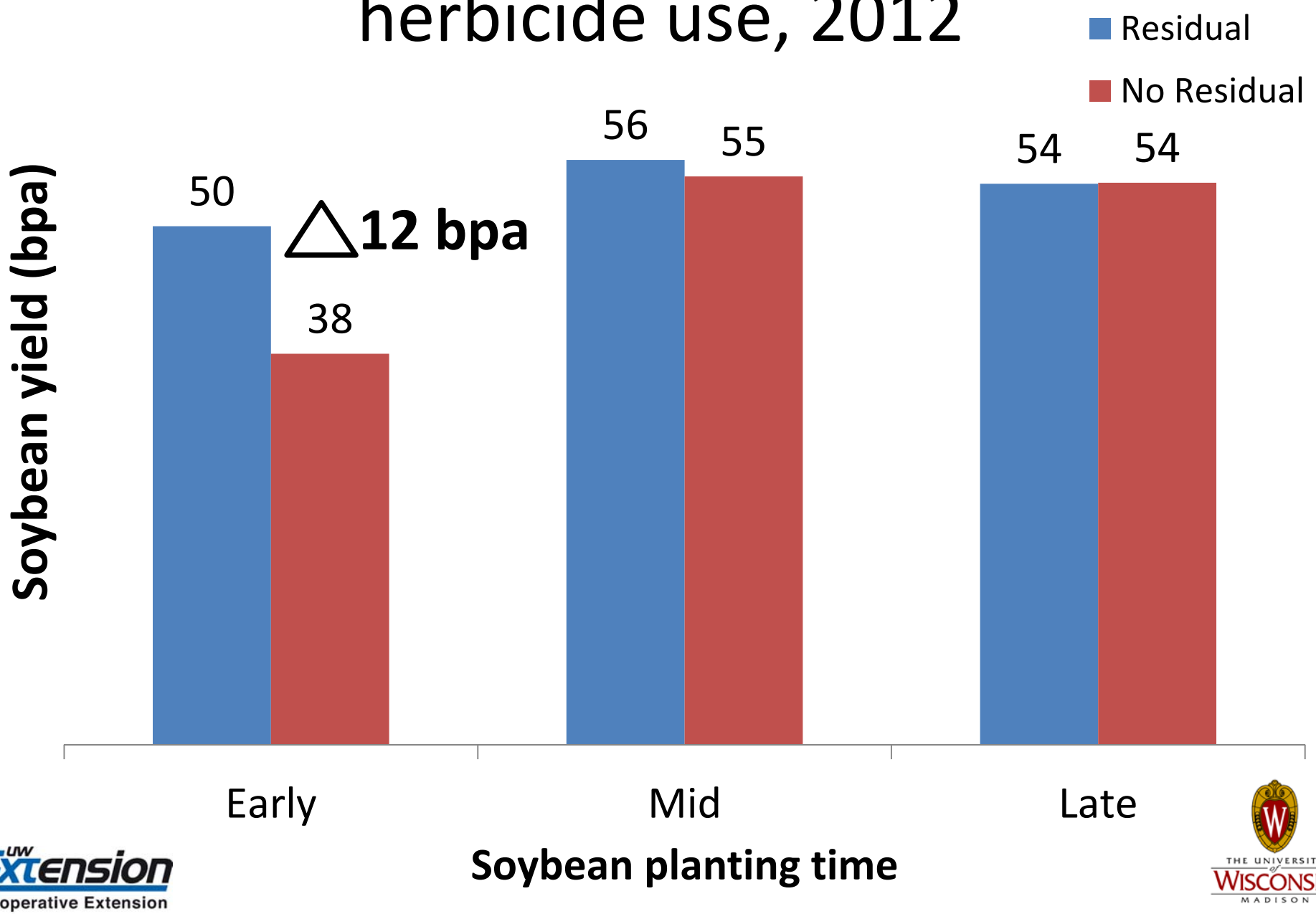
Planting Date by Residual herbicide use, 2012

- Soybean planting date by residual herbicide use by POST glyphosate timing
  - Late-April ; Mid-May ; Early-June
  - Residual (sulfentrazone + cloransulam) ; no-residual
  - V1 ; V2 ; V4 ; R1

- Year one: odd weather year, but still interesting

Yield for Planting Date by Residual herbicide use, 2012



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Seeding Rate by Residual herbicide use

o Site Description

- Field Preparation
  - Fall - chisel plow
  - Spring – field cultivator (twice)
- Planted on **May 21 in 15" rows**
- **120,000 seeds/acre**
- Predominant Weed Species
  - common ragweed
  - common lambsquarters
  - giant foxtail

o Experimental Design

- 2 x 2 x 5 factorial in RCB
  - **[2] With or without PRE residual**
  - [2] POST herbicide applied at V4
    - glyphosate program
    - conventional program
  - [5] Soybean seeding rates
    - high
    - moderate
    - high blend
    - moderate blend
    - low

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Seeding Rate by Residual herbicide use

Herbicide Treatments	
PRE residual	S-metolachlor+
	fomesafen
Conventional program	imazamox fb
	fluazifop[b]
Glyphosate program	glyphosate+
	imazamox

Seeding Rate Structure	
Seeds / acre	
High	190,000 GR[a]
Moderate	120,000 GR[a]
High blend	120,000 GR[a]
	70,000 C[b]
Moderate blend	95,000 GR[a]
	35,000 C[b]
Low	60,000 GR[a]

[a]glyphosate-resistant seed

[b]conventional seed

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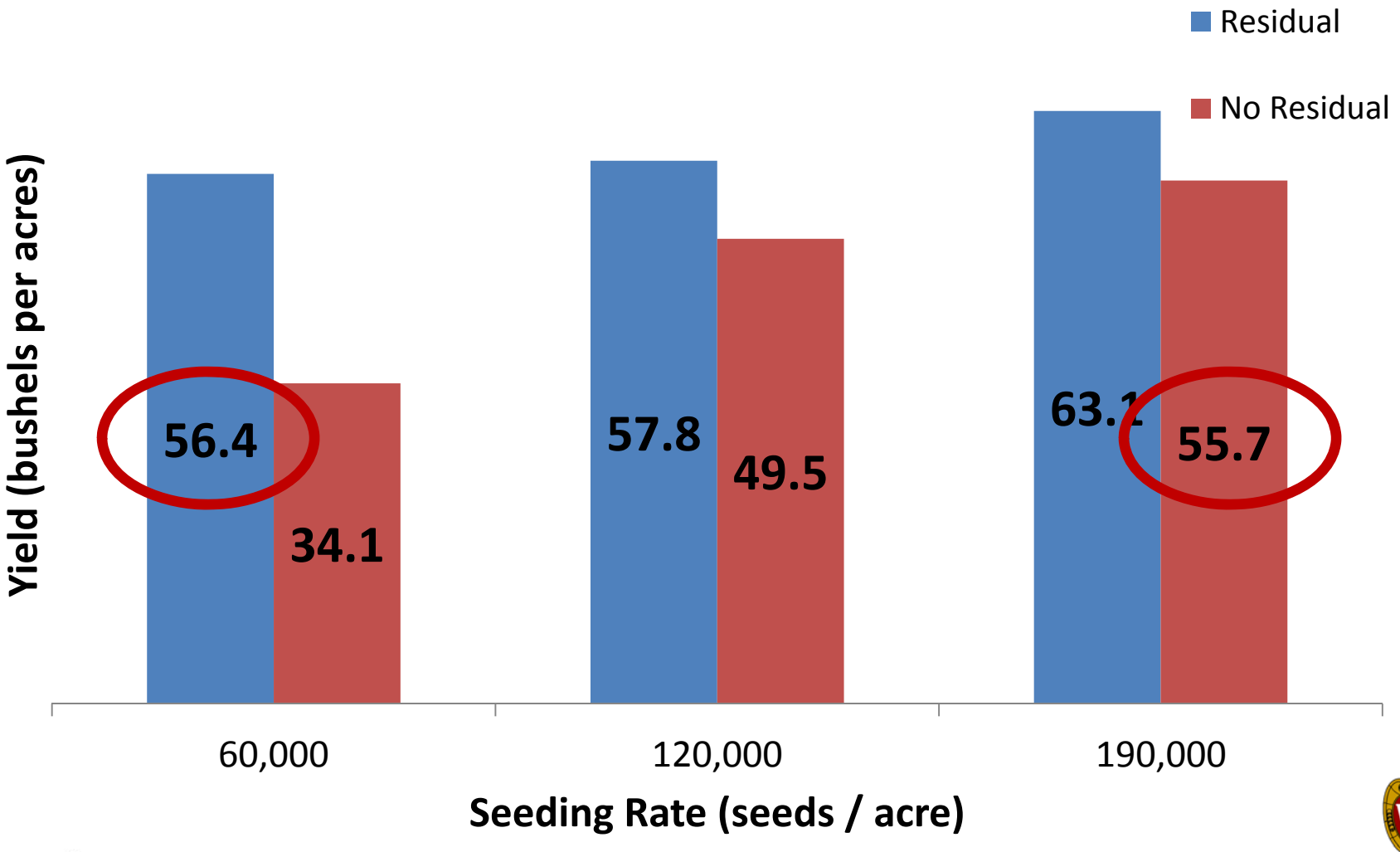
Yield for Seeding Rate by Residual herbicide use

Residual herbicide	Postemergence herbicide	Seeding rate	Soybean Yield (bu/acre)
No	Glyphosate	190,000 rr	58.8
No	Conventional	190,000 rr	52.6
Yes	Glyphosate	190,000 rr	68.4
Yes	Conventional	190,000 rr	57.7
No	Glyphosate	120,000 rr	55.1
No	Conventional	120,000 rr	43.9
Yes	Glyphosate	120,000 rr	58.2
Yes	Conventional	120,000 rr	57.3
No	Glyphosate	60,000 rr	36.3
No	Conventional	60,000 rr	31.8
Yes	Glyphosate	60,000 rr	57.8
Yes	Conventional	60,000 rr	54.9
		LSD (0.05)	9.74

Yield for Seeding Rate by Residual herbicide use (POST Gly + Conv pooled)



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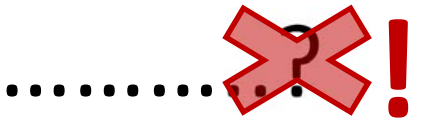

- Across a number of studies in 2012, residual herbicides still proved valuable for protecting yield providing an excellent ROI
- Including
  - Better glyphosate resistance management


Thanks for your attention!
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