Economics of Residual Herbicides in Roundup Ready Crops

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Roundup Ready Facts

Roundup Ready Adoption

- > 75% Roundup Ready Soybeans
- ≅ 10% Roundup Ready Corn

Glyphosate lacks soil residual activity

Glyphosate is applied postemergence in Roundup Ready crops

What is the effect of weeds before or after the glyphosate application?

Benefit of Residual Herbicides?

Will a residual herbicide applied preemergence protect against early season weed competition and increase yields?

Will a residual herbicide tank mixed with glyphosate protect against late season weed competition and increase yields?

Does this effect differ between soybeans and corn?

Which crop benefits most?

Tolerates early season weed competition longer	soybeans	✓corn
Denser canopy limits late season weed survival	soybeans (narrow row)	✓corn

Let's see if Roundup Ready soybeans benefit from a preemergence residual herbicide.

Soybean Data Summary

16 experiments and 5 years (Harvey or Boerboom)

Direct herbicide comparisons (75 sets)

- with/without preemergence herbicide
  - Authority, Axiom, Boundary, Broadstrike, Command, Cover, Domain, Dual, FirstRate, Frontier, Prowl, Pursuit, Pursuit Plus, Python, Sencor, Turbo, Valor
- at same glyphosate rate
  - (0.38, 0.56, or 0.75 lb ae/a)
- at same glyphosate application timing (V2-3)

Across tillage and row spacings

Weed control was generally excellent

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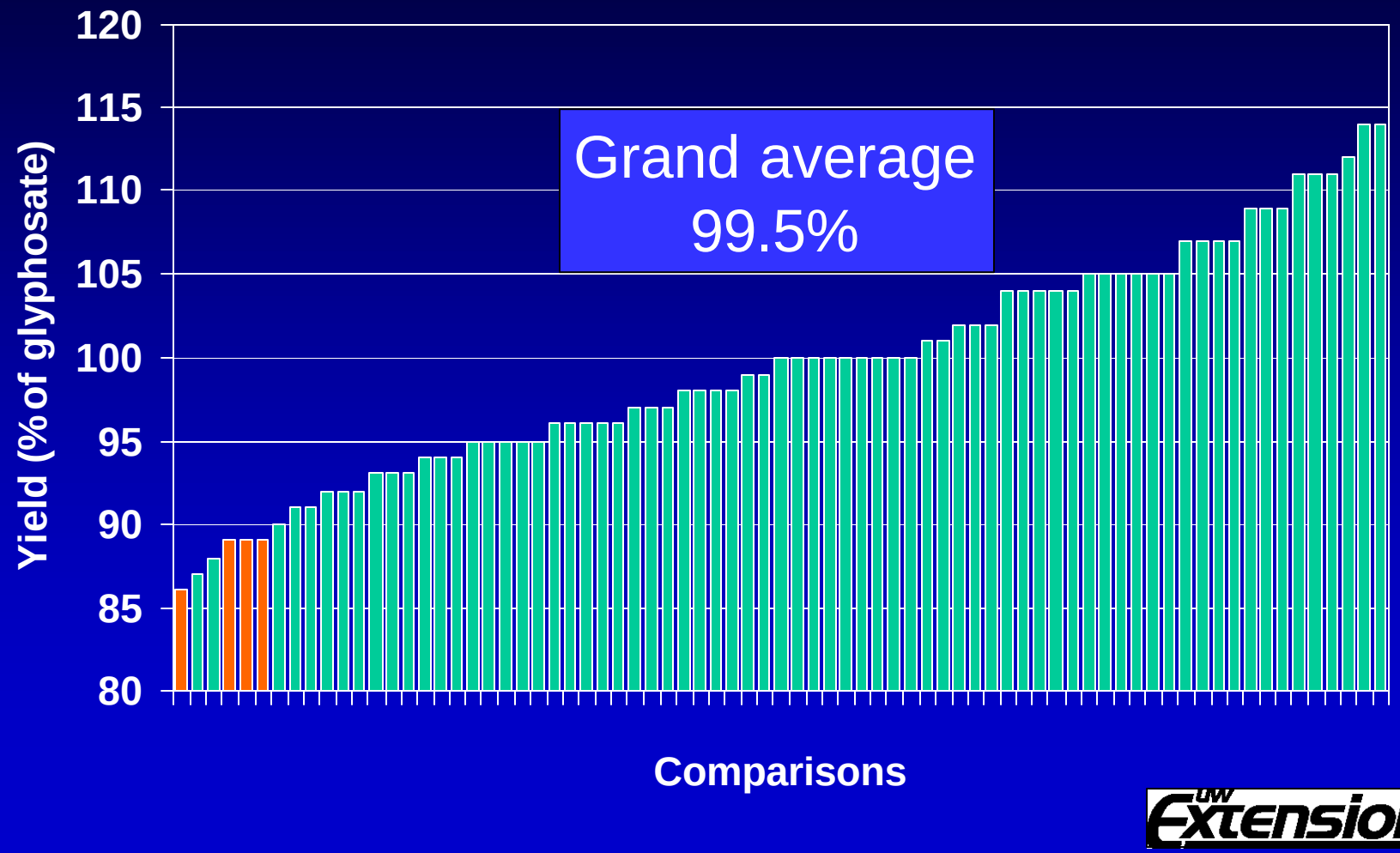
Yield Conversion Example

Soybean yield		
Glyphosate alone	Residual + Glyphosate	% of Glyphosate
55 bu/a	58 bu/a	105%
55 bu/a	50 bu/a	91%
LSD (0.10)	6 bu/a	

Yield: RR soybean with a residual herbicide compared to RR soybean treated only with glyphosate



Corn Data Summary

10 experiments and 4 years (Harvey or Boerboom)

Direct herbicide comparisons (31 sets)

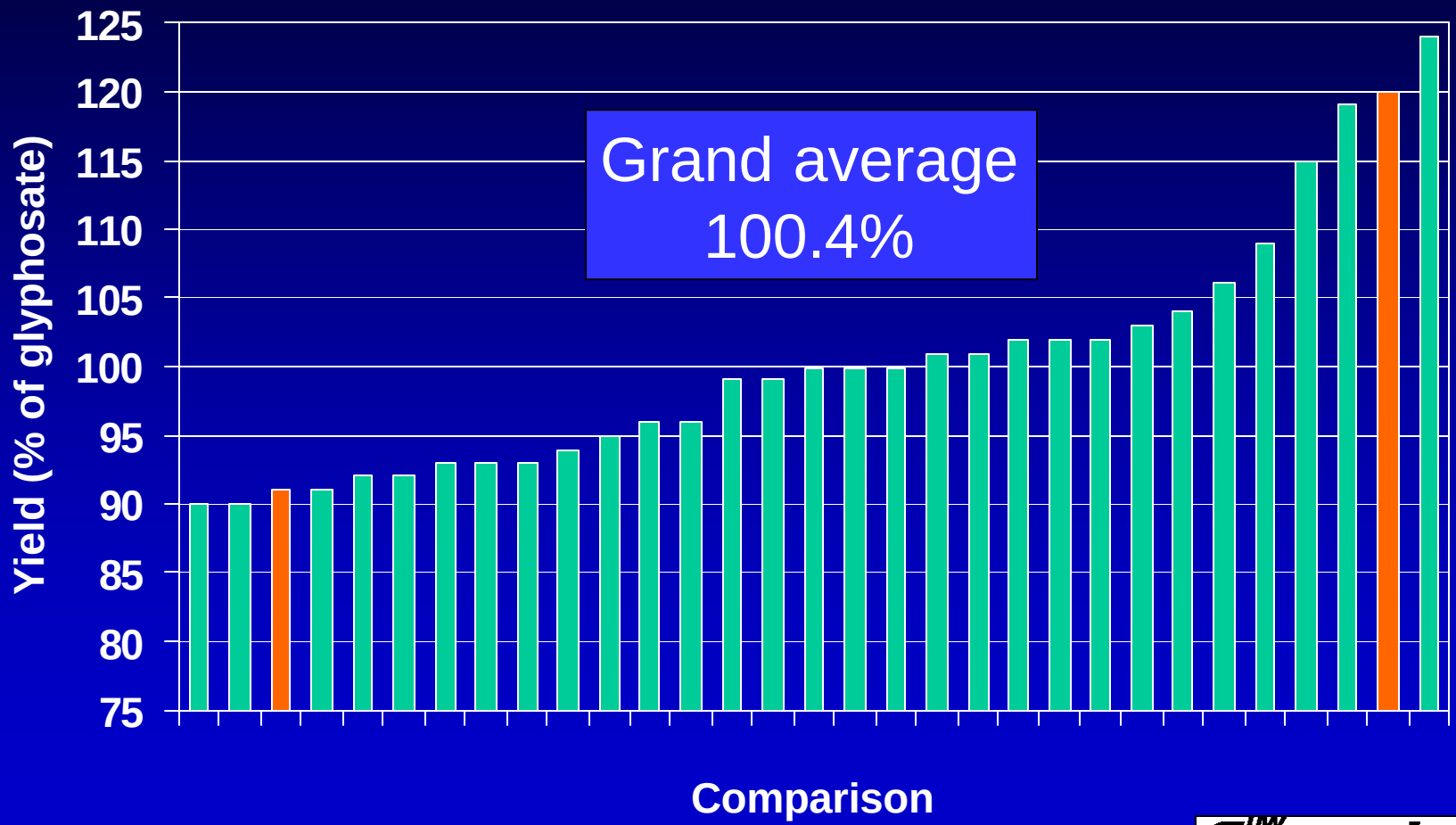
- with/without preemergence herbicide
  - Axiom, Bicep, Broadstrike, Dual, Harness, Harness Xtra, Hornet, Prowl, Python
- at same glyphosate rate
  - (0.38, 0.56, or 0.75 lb ae/a)
- at same glyphosate application timing (V2-3)

Weed control was generally good

Yield Conversion Example

Corn yield		
Glyphosate alone	Residual + Glyphosate	% of Glyphosate
186 bu/a	197 bu/a	106%
186 bu/a	175 bu/a	94%
LSD (0.10)	15 bu/a	

Yield: RR corn with a residual herbicide compared to RR corn treated only with glyphosate



Potential Conclusions

Properly timed glyphosate applications in Roundup Ready soybeans and corn appear to protect yields on average

Late glyphosate applications can result in yield loss

Preemergence residual herbicides can lengthen the window for glyphosate applications

RR Soybean Yield Example

Residual herbicide	Glyphosate rate (lb ae/a) 0.38	0.38+R	0.56	0.56+R
			(bu/a)	
Command 3ME				
2 trifoliate	51	47	52	54
4-5 trifoliate	43*	51	43*	49
Prowl				
2 trifoliate	51	48	52	49
4-5 trifoliate	43*	51	43*	48

6.75 bu x $5 = $33.75

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RR Corn Yield Example

Residual herbicide	Glyphosate rate (lb ae/a) 0.56	0.56+R
	(bu/a)	
Dual II Magnum		
V3-4	179	177
V7	154*	175
Bicep Lite II Magnum		
V2-3	211	195
V5	198	192
V7	132*	196


June 1, V2-3 corn, 2 pt/a Roundup Ultra - 211 bu/a


June 9, V5 corn, 2 pt/a Roundup Ultra - 198 bu/a


June 17, V7 corn, 2 pt/a Roundup Ultra - 132 bu/a

Potential Benefits of Residual Herbicides in Roundup Ready Crops

1. Greater potential benefit in corn than soybeans
2. Lengthens window before glyphosate application without causing a yield loss
3. Provides risk management when uncertainties in application timing exist
   - Large number of acres
   - Wind and rain delays will happen
4. May reduce weed seed production
5. Adds other modes of action, which may delay resistant weeds