ILLINOIS SOYBEAN ASSOCIATION
CHECKOFF & MEMBERSHIP PROGRAMS

Yield Challenge ILLINOIS

The Yield Story

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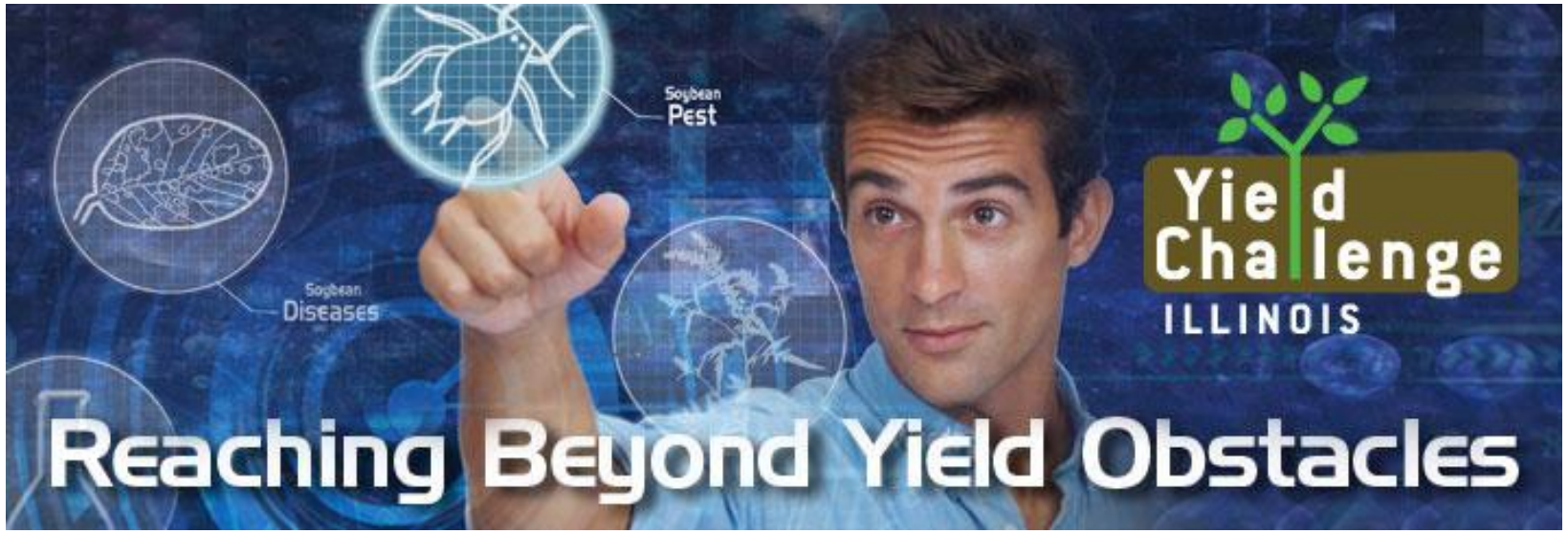
CHECKOFF PROGRAM

Funded by the **Illinois** Soybean Association checkoff program.

Bringing Science to Bear
Purpose of the Yield Challenge



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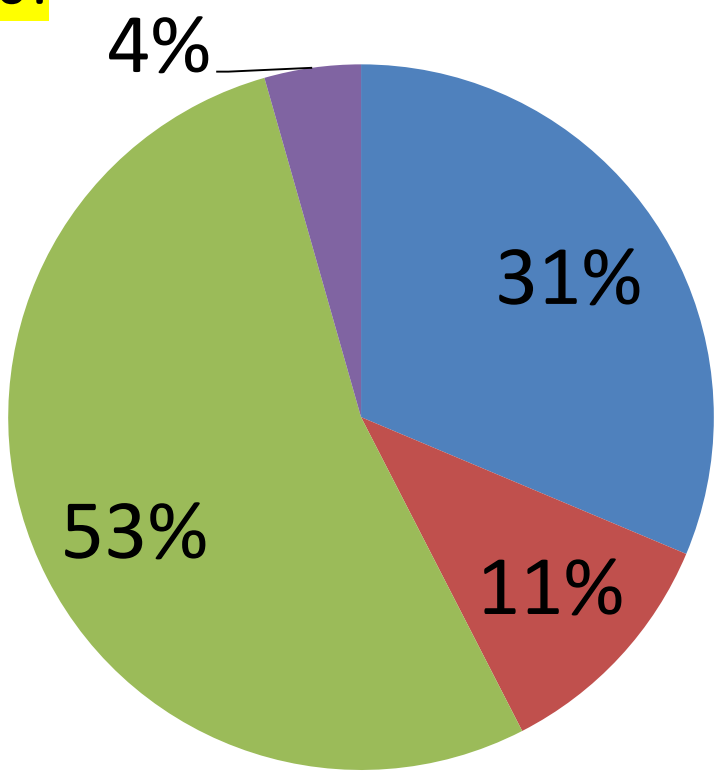
What do farmers think – Has soybean yield hit a plateau?

Think back to 2010!



Total responses = 702

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Why it's Important

- Most growers believed yields were stagnate and there is little opportunity to achieve high yields
- The yield potential exists as proven by Cullers' and Dowdy's 160 and 171 bpa examples, but it will take some special attention to achieve the needed yield gains
- *"No one ever asked me to talk about soybeans anymore. I am asked to talk about corn or corn-on-corn. If we want to be successful in producing higher yielding soybeans, we need to go back to school on agronomy."* Dan Bjorklund, Winfield Solutions

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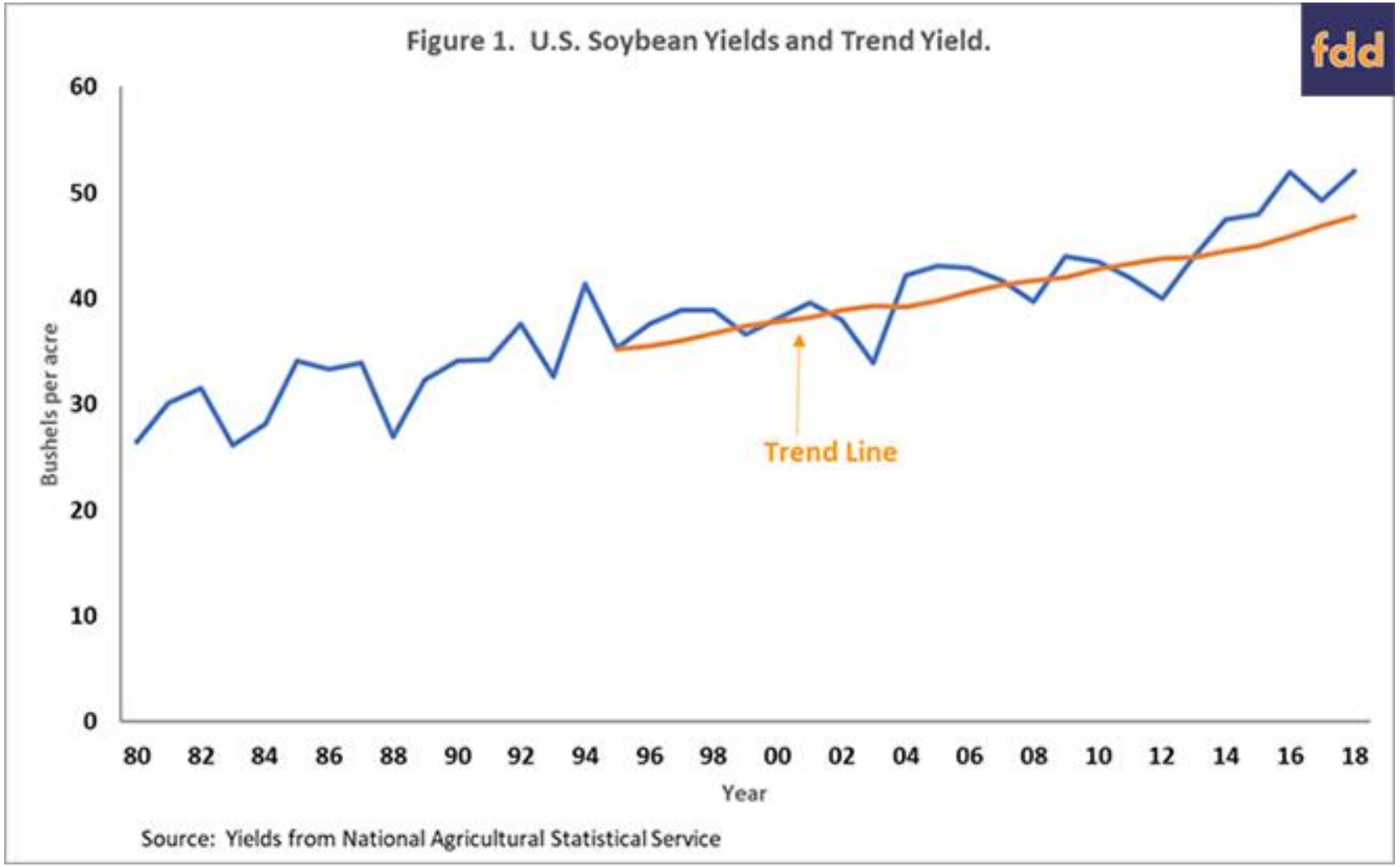
U.S. Soybean Yield Trend



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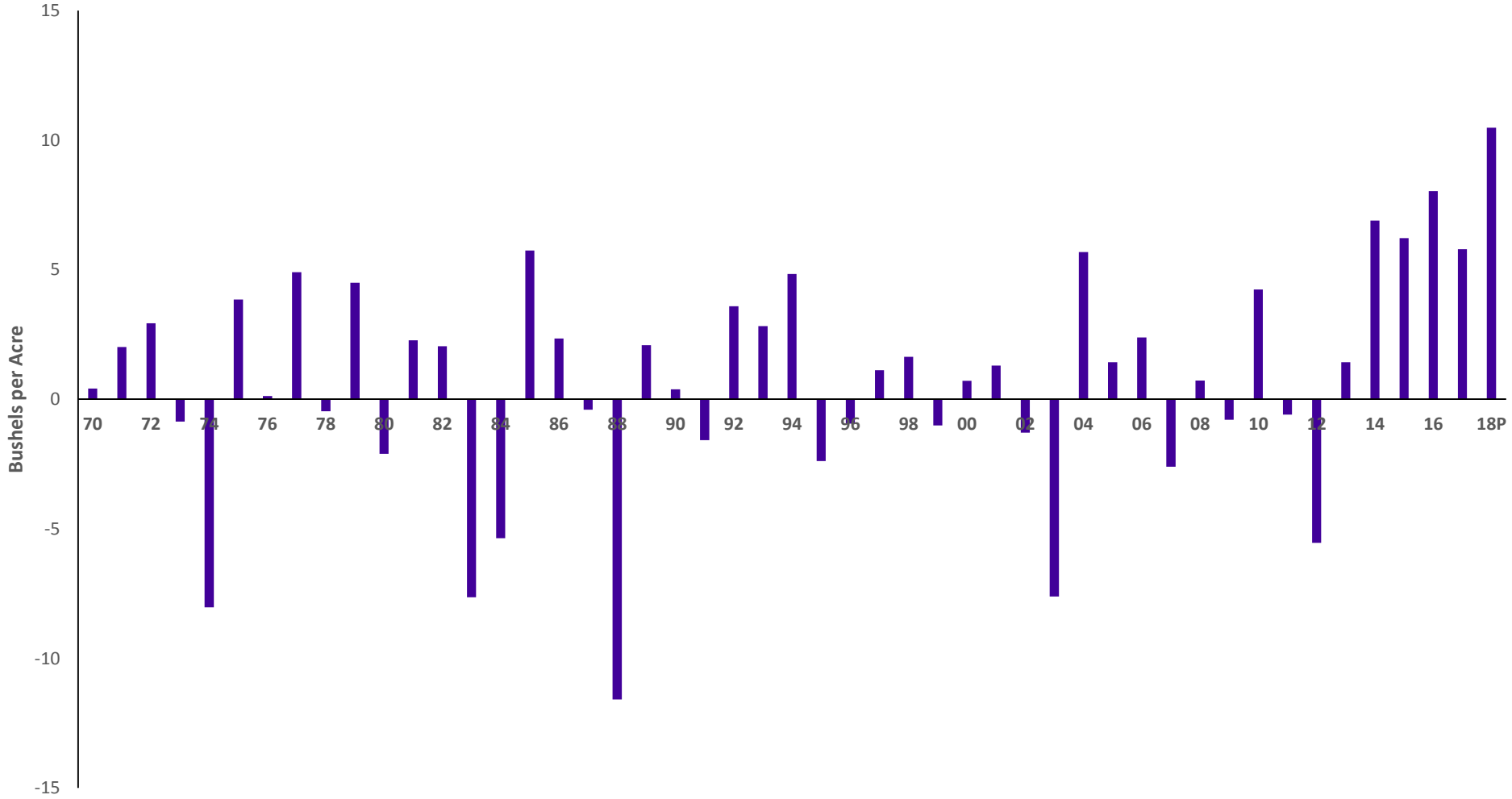
Yield Deviations From Trend



2013 +1
2014 +6.5
2015 +6
2016 +7
2017 +5
2018 +10

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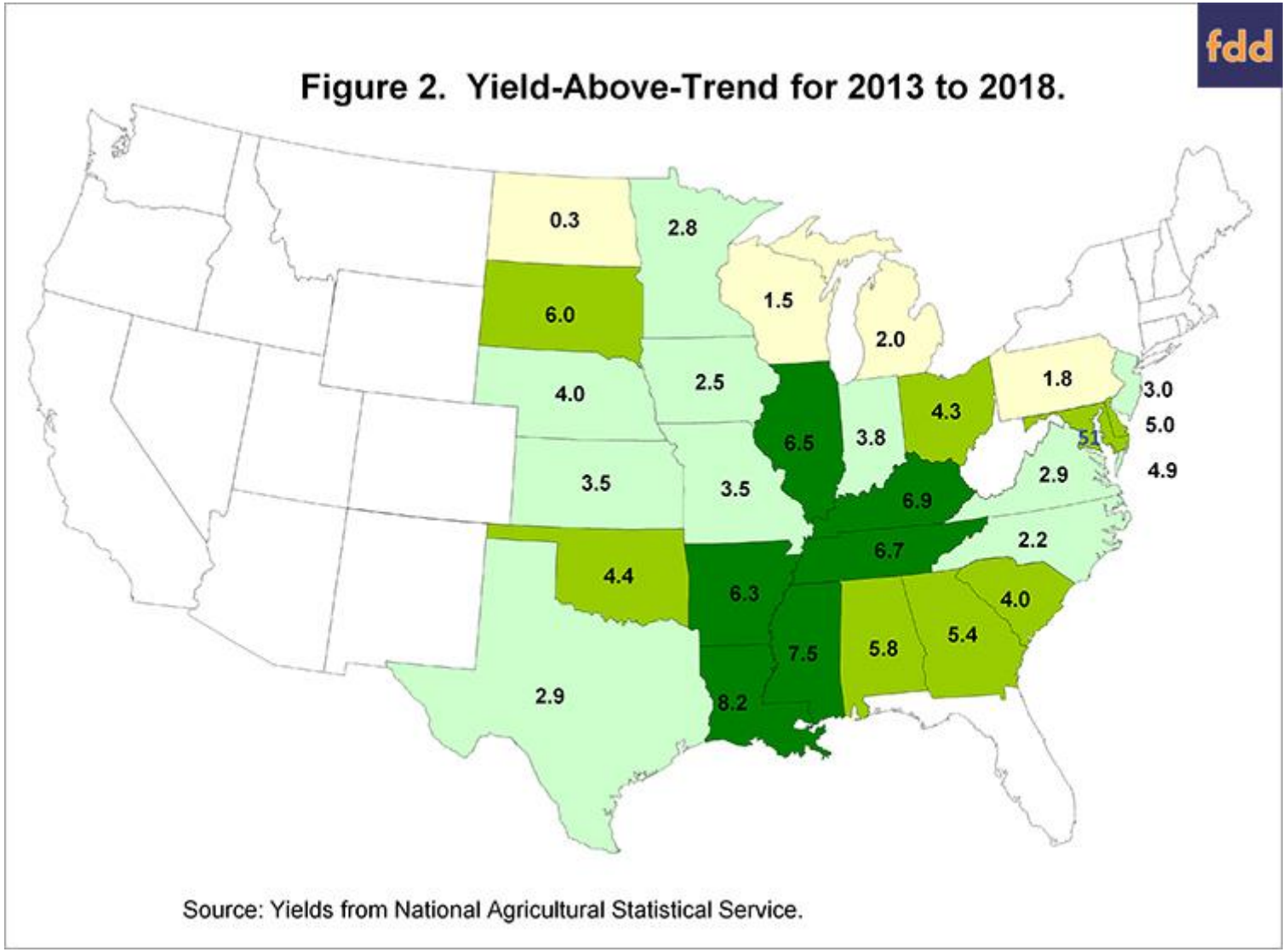
Yield Above Trend



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Why aren't we all raising 80, 90 or 100 bu? Kris Ehler, 2018 Summit

- Relying on genetics only to give us increases in yields.
- "Overall, there is little evidence to date that soybean genetics have been improving at a faster rate in recent years." Scott Irwin, Department of Agricultural and Consumer Economics, University of Illinois 12/29/2017
- Slow to incorporate new post applied products.
- Still in love with producing corn.
- No "On farm evaluations or test plots".
- "Can't afford any "extras"".

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Pursuit of 100 Bushel – Natl Pastime

- 2006 MO Kip Cullers did the impossible 139 bu
  - Previously it was thought that 100 bu was the theoretical maximum
- 2007 Mo Kip Cullers a new record of 154 bu
- 2010 Mo Kip Cullers sets World Record 160.6 bu
- 2014 IL Dan Arkles broke 100 and reached 103.95 bu
- 2015 IL Robert and Jason Lakey hit 108.3 bu and set new IL record.
- 2016 IL Lakey's reach 106.28 bu
- 2016 GA Randy Dowdy sets world record at 171.7 bu
- 2017 IL Lakey's break own record at 110.03 bu
- 2018 IL 14 growers broke 100 bushels

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ISA Yield Challenge: Purpose

- Discover management practices necessary to maximize yield
- Encourage the use of new practices to help increase yield and profit
- Promote profitable and sustainable agricultural practices
- Provide useful data that can be evaluated by researchers, agri-businesses and growers for improving yield potential

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Categories

- Conducted side-by-side plot comparisons in 2010, 2011, 2012, 2013
- 100-Bushel Challenge was added in 2014
- District Yield Contest was added in 2015
- Double Crop Contest was added in 2017

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Typical High Yield Practices Tested

1. ***Pre-Plant – Soil treatments, fertilizers, and biological treatments***
2. ***Tillage type***
3. ***Seed treatments***
4. ***Seeding timing, rates and spacing, and placements***
5. ***Foliar fertility feeding and treatments***
6. ***Foliar fungicides***
7. ***Foliar insecticides***
8. ***Post-Plant – Soil applied fertility***

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Yield Challenge ILLINOIS

Summary Results - 2010

1 above 80 bu

Summary of Yield Challenge Results	
Range of yields	**28 to 84.9 bu/ac**
Standard Plots – Ave	**63.9 bu**
Challenge Plots – Ave	**67.75 bu**
Average increase	**3.85 bu**
Yield Differences	**-10 to +26 bu/ac**
Range of % Difference	**-14 to +47%**
Average % Difference	**+6.45%**

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2010 Results by Categories

All plots within a category			
CATEGORY	# of plots	Bushel Increase	% Increase
Pre-Plant Fertility	**32**	**2.76**	**4.80%**
Seed Treatment	**56**	**2.91**	**4.67%**
Foliar Feeding	**115**	**3.46**	**5.73%**
Foliar Insecticide	**120**	**4.35**	**7.28%**
Foliar Fungicide	**138**	**3.36**	**6.80%**

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Summary Results - 2011

						Average of top 5 in each team			
Dist.	Place	Team Name	Sponsor	No. of Growers	Categories Tested	Standard Plot Average	Yield Challenge Plot Average	Yield Bushel Difference	Average % +
1	1st	Syngenta District 1 N	Syngenta	8	Seed treatment, insecticides, fungicides	66.6	71.6	4.9	7.07%
	2nd	Pioneer District 1	Pioneer	7	pre-plant fert, seed treatment, foliar feeding, insecticides, fungicides	73.2	77.1	3.9	5.38%
2	1st	Elburn Coop	Pioneer	9	foliar feeding, insecticides fungicides	66.9	73.5	6.6	10.11%
	2nd	BASF District 2	BASF	7	pre-plant fert, seed treatment, foliar feeding, insecticides, fungicides	66.3	68.9	2.6	3.95%
3	1st	CPS Ferris	BASF	6	foliar feeding, insecticides fungicides	49.6	55.6	6	11.86%
	2nd	CPS Blandinsville	BASF	10	foliar insecticides, fungicides	68.6	76.6	7.9	11.69%
4	1st	Sunrise FS	BASF	9	foliar feeding, insecticides fungicides	67.0	77.7	10	15.46%
	2nd	AgLand FS	BASF	7	pre-plant fert, seed treatment, foliar feeding, insecticides, fungicides	49.1	56.6	7.5	13.15%
5	1st	The Good 5th	Stone Seed Group	5	foliar feeding, fungicides	55.9	63.9	7.9	14.17%
	2nd	Vinson Seed Service	BASF	7	foliar insecticides, fungicides	64.8	71.4	6.6	10.27%
6	1st	Shipman Elevator	BASF	6	foliar insecticides, fungicides	58.9	71.6	12.8	21.62%
	2nd	Lincoln Land FS	BASF	10	Seed treatment, weed control, foliar feeding, insecticides, fungicides	65.7	70.4	4.7	7.18%
7	1st	South Central FS	BASF	5	foliar insecticides, fungicides	63.3	68.7	5.4	8.92%
	2nd	BRT Ag and Turf	BRT	5	pre-plant fertilizer, strip tillage	34	36.1	2.1	6.07%

0 above 80 bu

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Summary Results - 2012

1 above 80 bu

- Drought but rains returned in mid-August
- Bushel/ac. range = 12.9 to 88.96
- Bushel increases/ac. = -11.07 to +22.92
- Overall avg. bu/ac. increase = 3.16

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Summary Results - 2013

District	Place	Sponsors	Yield Gain (bu/A)
1	1st	Ag View North	8.19
1	2nd	Ag View South	5.67
2	1st	Elburn Co-Op	3.92
2	2nd	Lukach Seed Agency	1.79
3	1st	Brandinsville CPS	11
3	2nd	West Central FS	9.6
4	1st	Sunrise FS	11.6
4	2nd	AgLand FS Lincoln	10.09
5	1st	Ehler Bros Seed	11
6	1st	Shipman Elevator	12.25
District	**Sponsor**	**Farmer**	**Yield (bu/A)**
1	Ag View FS South	Bob Pierson	88.96
1	Ag View FS North	Dan Rabe	84.39
2	Lukach Seed Agency	Dan Arkels	80.16

3 above 80 bu

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2014 Yields - winners

3 above 80 bu

2014	100 bu and District Yield Challenge Participants – 1st place winners			
First Name	**Last Name**	**District**	**Moisture %**	**Soybean Yield (bu/A)**
Dan	Arkels	2	12.5	103.949
Pete	Aberle	4	12.5	70.579
Kurt	Borman	1	13.1	61.113
John	Breedlove	4	14.2	45.734
Steve	Buxtons	7	14.4	68.069
Joe	Klein (Armstrong)	5	10.3	76.254
Joe	Klein (Rock Rd #1)	5	13.2	85.611
Chad	Kuenstler	7	12.1	79.519
Tony	Kuenstler	7	12.3	89.909
Ross	Prough	6	13.2	62.132

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2015 Yields – contest winners

District	Place	Yield
1	1st	92.13
	2nd	91.48
2	1st	85.44
	2nd	85.41
3	1st	88.73
	2nd	81.02
4	1st	79.50
	2nd	56.63
5	1st	108.27
	2nd	95.26
6	1st	85.76
	2nd	81.40
7	1st	87.02
	2nd	82.91
8	1st	93.94
	2nd	89.61
9	1st	87.58
	2nd	81.33

5 above 90 bu

17 above 80 bu

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2016 Yields - over 90 bushels

Name	District	Yield
Robert & Jason Lakey	5	**106.29**
David Wessel	6	**98.77**
Joe Klein	5	**96.21**
Dan Arkels	2	**95.99**
Doug Young	5	**93.61**
Jeff Bassett	2	**95.02**
Earl Boyer	4	**93.5**
Dan Arkels	2	**92.09**
Aaron Niebrugge	7	**91.86**
Rick Boyer	4	**91.19**
Grant Strom	3	**90.83**

11 > 90 bu
20 > 80 bu
22 > 70 bu

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2017 Yields

Name	Yield
Robert & Jason Lakey	**110.03**
Greg McClure	**108.18**
Alvin and Scott Landrey	**104.67**
Greg McClure	**101.84**
Joe Klein	**99.31**
Paul Klein	**99.02**
Alvin and Scott Landrey	**98.77**
Kevin Burrus	**96.43**
Dan Luepkes	**95.32**
Grant Strom	**94.01**
Dan Luepkes	**93.62**
Luke Heaton	**91.52**

4 > 100
8 > 90
10 > 80

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2018 Yields

Entrant	Yield
Chuck Walsh	112.48
Paul Klein	110.94
Greg McClure	110.19
Ken Elmore	108.31
Cameron McClure	108.06
Joe Klein	106.28
Greg McClure	105.18
Dan Luepkes	103.46
Edward Logan	103.19
Duane Noland	102.50
Tom Elmore	101.89
Marc Padrutt	101.07
Travis Rovey	100.78
Travis Rovey	100.54

14 > 100
30 > 90
13 > 80
9 < 80

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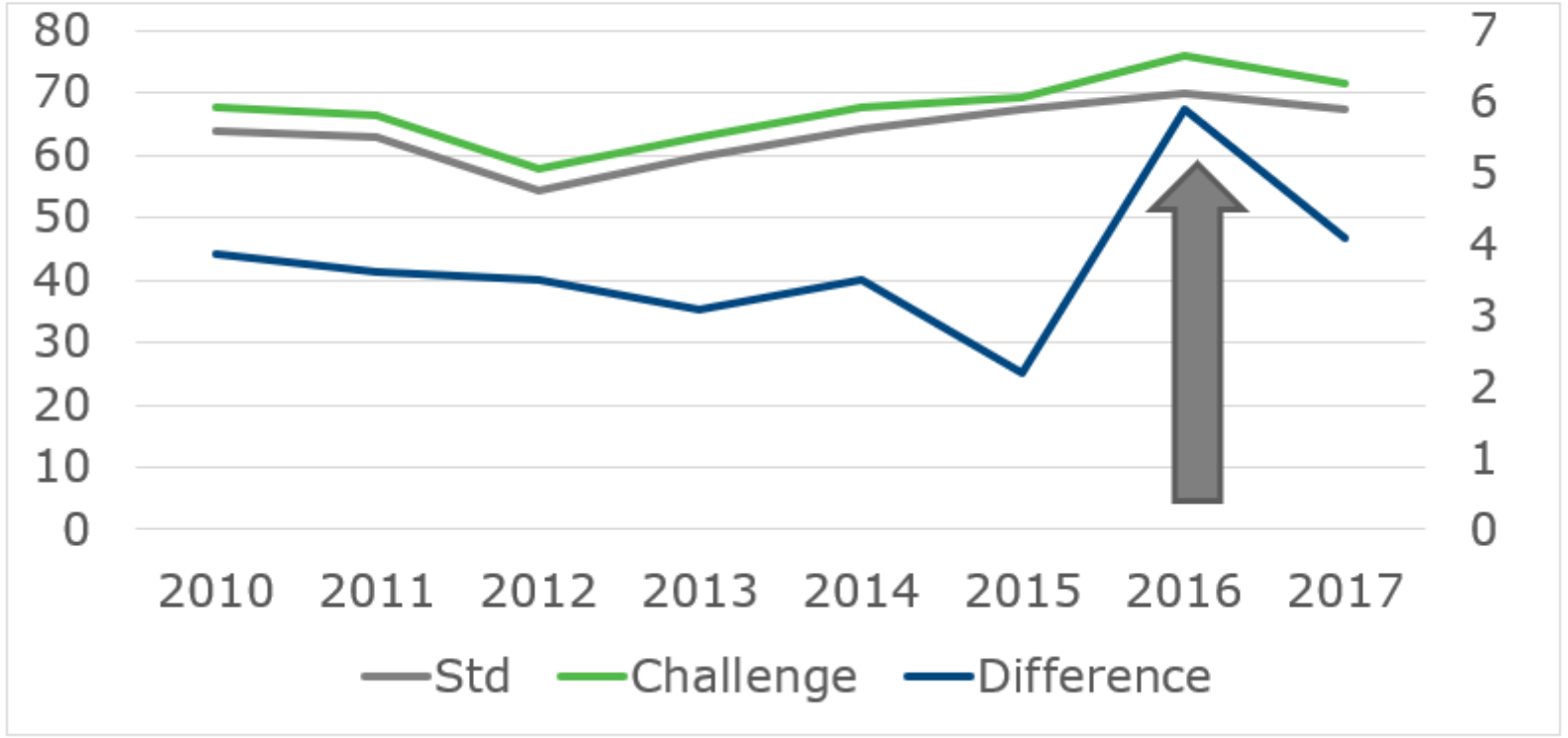
Illinois Yield Challenge Gains

Bu/A

Adding 1 or 2 new things to the system!

Bu/A increase with treatment



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Soybean Practices

- Foundation
  - Variety
  - Seeding
    - Planting date
    - Row spacing
    - Population
  - Tillage
  - Liming
  - Fertilizer
  - Weed control

- Technology
  - Seed treatment
    - Basic F+I
    - Advanced F+I+?
      - SCN, SDS
    - Inoculants
  - Foliar fungicide
  - Foliar insecticide
  - Foliar feeding
  - PGR/biostimulants
  - Starters

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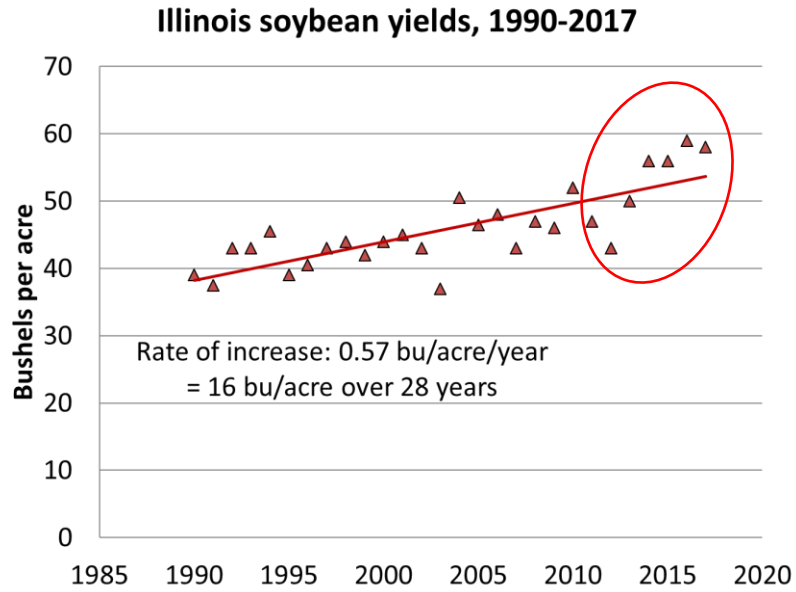
Illinois Soybean Yields

- Yields no longer stagnate
- Genetic gain
  - 1/3 bu/A/yr. <2000
  - 2/3 bu/A/yr. >2000
- Genetic + Mgt
  - 0.57 bu/A/yr. = 16 bu/A gain from 1985-2015
  - 2.9 bu/A/yr. = 15.5 bu/A gain from 2011-2017



Emerson Nafziger, UI, 12/2017

http://ilsoyadvisor.com/agronomy/2017/december/webinar-the-amazing-2017-soybean-season-lessons-for-2018/

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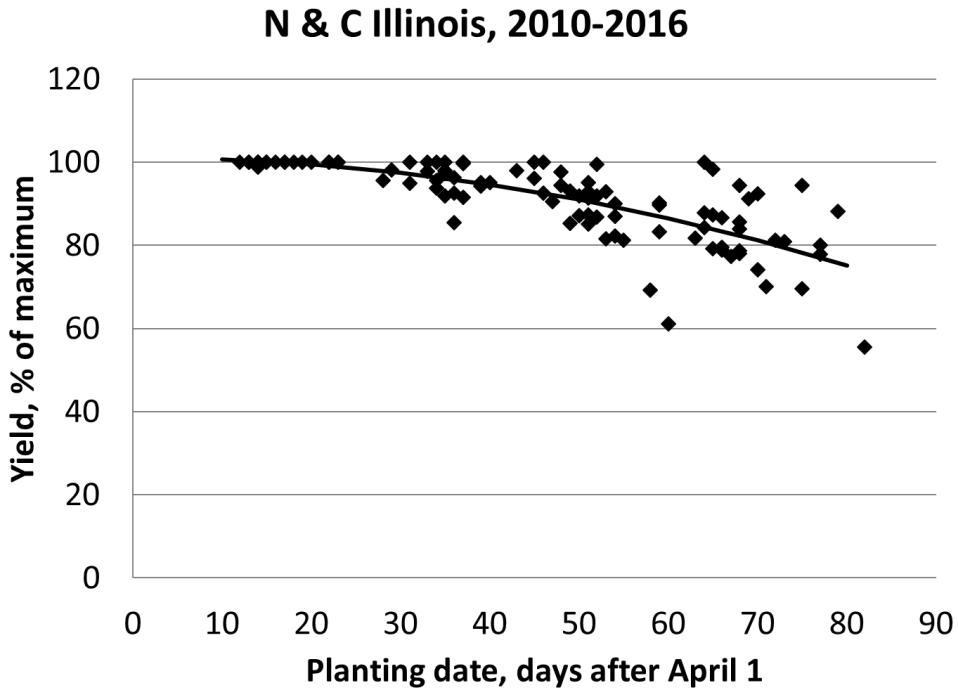
Why is Yield Increasing

- Planting early
- Optimal yield at
  - Plant 120-150k
  - Stand 90-110k
- Seed treatment
  - Responses in research rare
- Tilled: +1-2 bu/A
- Rotation+: CWS> CCS>CS > SS



Emerson Nafziger, UI, 12/2017

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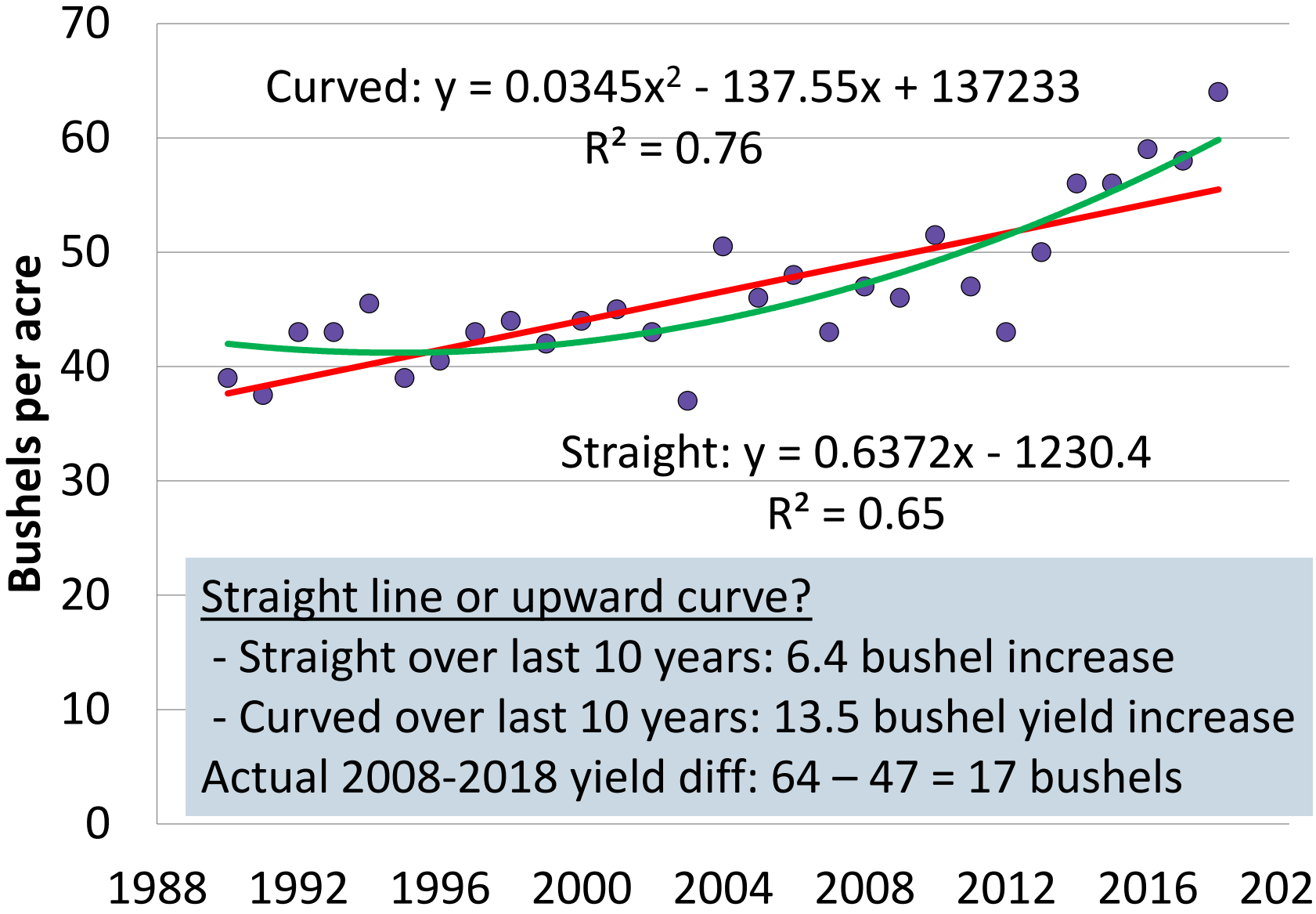
Illinois soybean yields, 1990-2018



Straight line or upward curve?

- Straight over last 10 years: 6.4 bushel increase
- Curved over last 10 years: 13.5 bushel yield increase

Actual 2008-2018 yield diff: 64 – 47 = 17 bushels

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Answers are in the Details

- Results tells us:
  - Practicing good agronomics is only the foundation to higher yield potential
    - Variety selection and performance under high management
    - Row spacing, planting date, population, planting depth, weed control, residue management, soil temperature
  - Achieving a 10+ bushel per acre yield increases come from adding technologies and practices on top of good fundamental agronomics
- Yield Challenge
  - Opportunity to evaluate practices and products
  - Share learnings with other Illinois producers

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2019 Yield Challenge

soyyieldchallenge.com

Sign Up Today

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Yield Challenge ILLINOIS

SOYBEAN MANAGEMENT LESSONS LEARNED FROM THE 2018 ILLINOIS YIELD CHALLENGE

Bob Wells
Challenge Coordinator
Bement Illinois

Dan Davidson
ISA Consultant
Omaha Nebraska

Soybean Summit
February 5, 2019
Springfield Illinois

1994

"If you have 100 farmers in a room, you will have 110 different ways to farm."

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1994

"If you have 100 farmers in a room, you will have 110 different ways to farm."

In 2018

"Make that 210 different ways to farm"

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FUN WITH NUMBERS !

1994

"If you have 100 farmers in a room, you will have 110 different ways to farm."

In 2018

"Make that 210 different ways to farm"

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MEY

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MEY

Maximum Economic Yield

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MEY

ROI

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Illinois 100-Bushel Yields

Anonymous	121.67	Chuck Walsh (Reg. 2)	112.48
Paul Klein (State 100)	110.94	Greg McClure (St. Irr.)	110.19
Ken Elmore (Reg. 3)	108.31	Cameron McClure (Irr.)	108.06
Joe Klein	106.28	Greg McClure (dryland)	105.18
Dan Luepkes (Reg. 1)	103.46	Edward Logan	103.19
Duane Noland	102.50	Tom Elmore	101.89
Marc Padrutt	101.07	Travis Rovey (2)	100.78

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Illinois
90-Bushel Yields

Don Dugan	99.25	Zane Freeland (2)	98.47
Luke & Eric Heaton	97.46	Aaron Ehnle	97.00
Dick Haas (3)	96.98	Carl Luebchow	96.83
Grant Strom (2)	96.65	Daryl Keiser	96.07
Cory Utterback	95.88	Chad & Kyle Kuenstler	95.68
Michael Denton (3)	95.01	Jason Lakey	93.93
Robert Lakey (2)	91.95	Derek Martin	91.76
Bryan Severs	91.40	Mickey Williams	91.12
Mark Kannmacher	90.84	Barbara Zick	90.53
Matt Krausz (Reg. 4)	90.22	Jimmy Ayers	90.30
Kelsey Schwab	90.00		

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Illinois 80-Bushel Yields

Bob Jodts (s-b-s)	89.02
Kris Ehler	88.43
David Wessel (Irr.)	88.26
Jason Lay	87.47
Rex Schwartz	87.27
Eric Dolbeare	85.83
Brian Mansfield (s-b-s)	85.70
Alan Madison	84.65
Brad Crane	83.70
Gary Rapp	82.10
Jim Martin (s-b-s)	82.00

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Yields 68–79.9 bushels per acre

James Ryan	79.78
Vernon Mayer	75.24
Ralph Timpner	72.07
Fred Schirer	69.69
John Breedlove (Reg. 2 S-b-S)	68.26

Double Crop Yields

Matt & Mark Krausz (Reg. 3)	64.94
James Kight-Garlisch (Reg. 2)	62.68
Chad Kuenstler	61.64
Larry Garlisch	58.66

- No Region 1 Entries

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100+ Bu Yields

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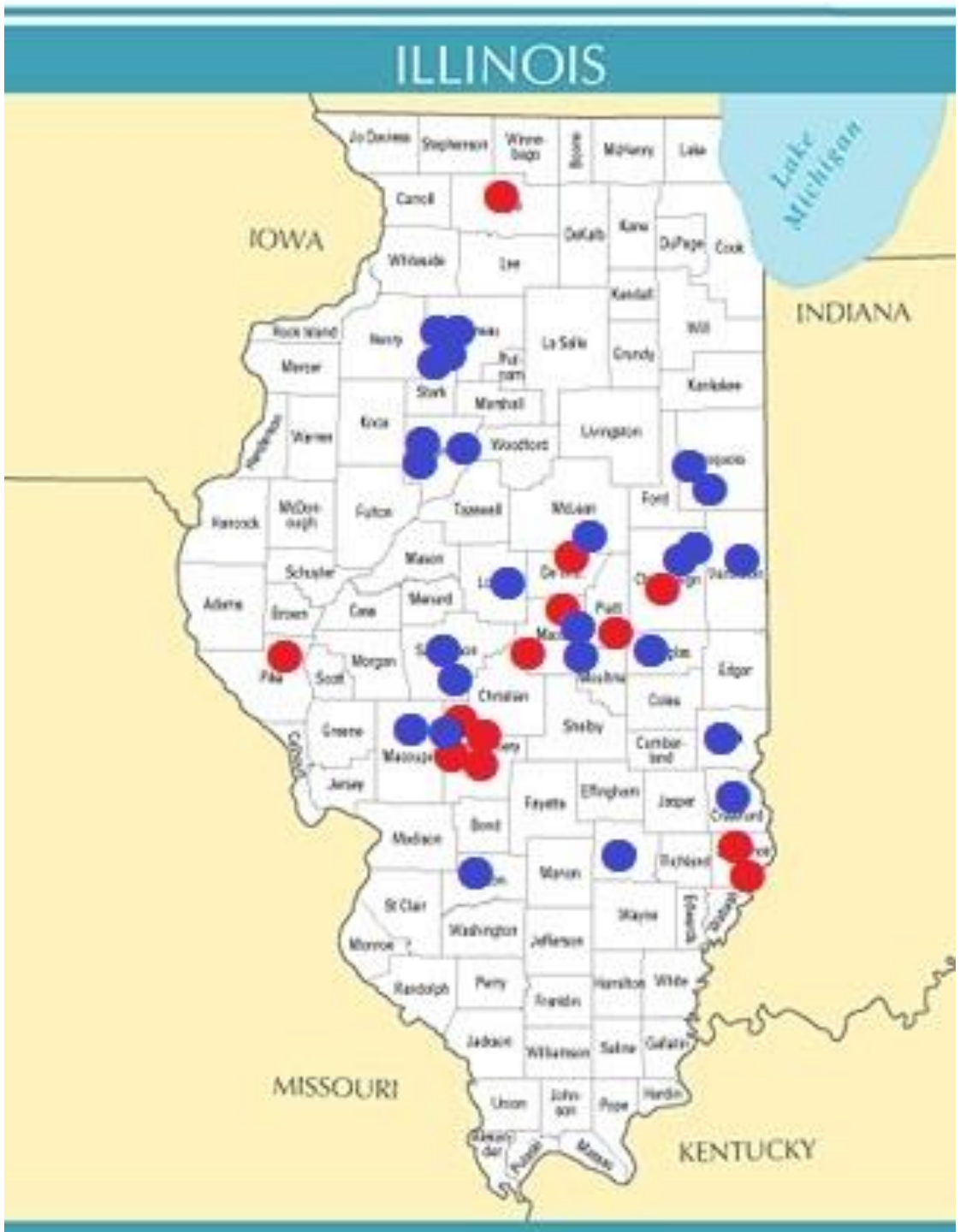
90+ Bu Yields



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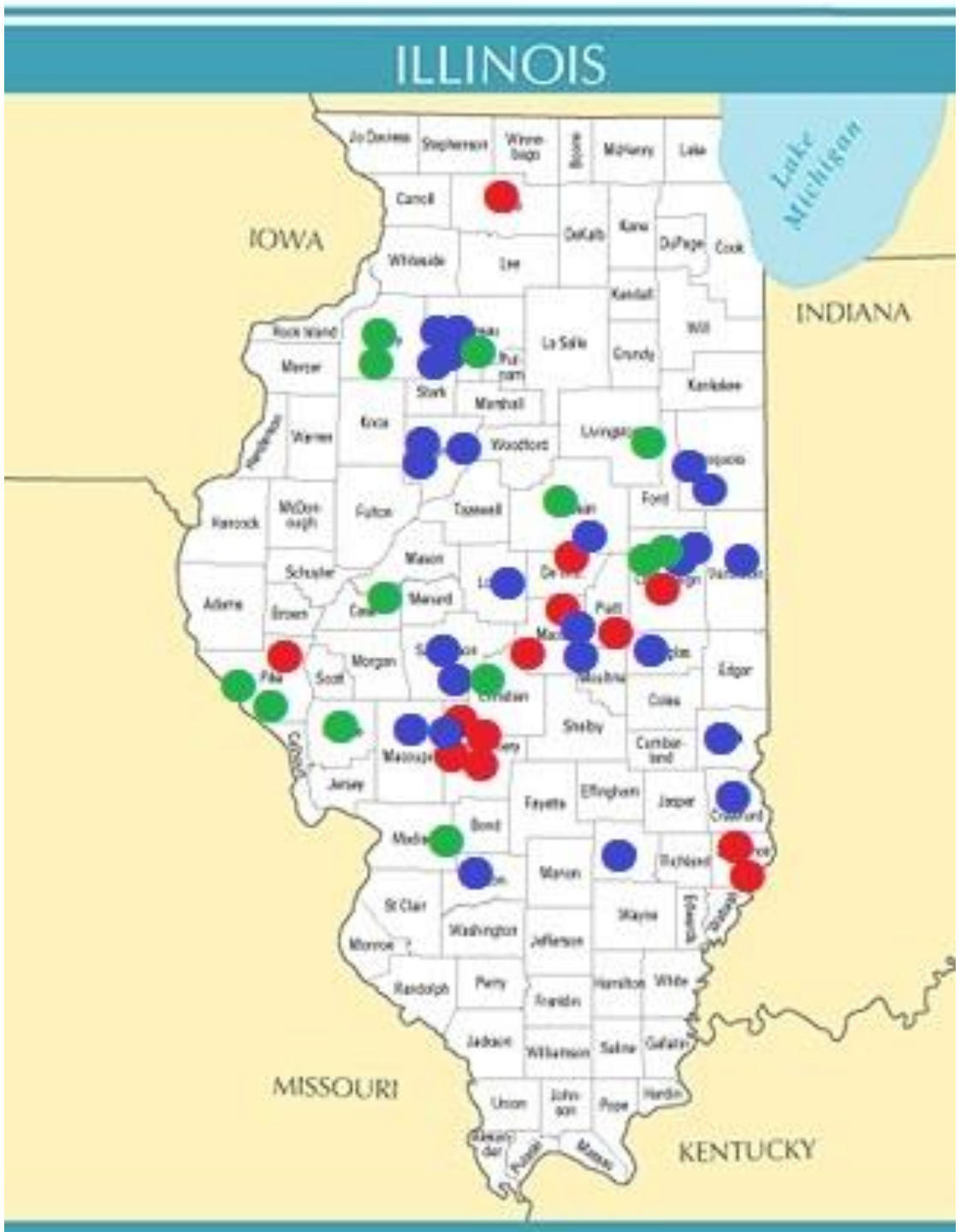
80+ Bu Yields



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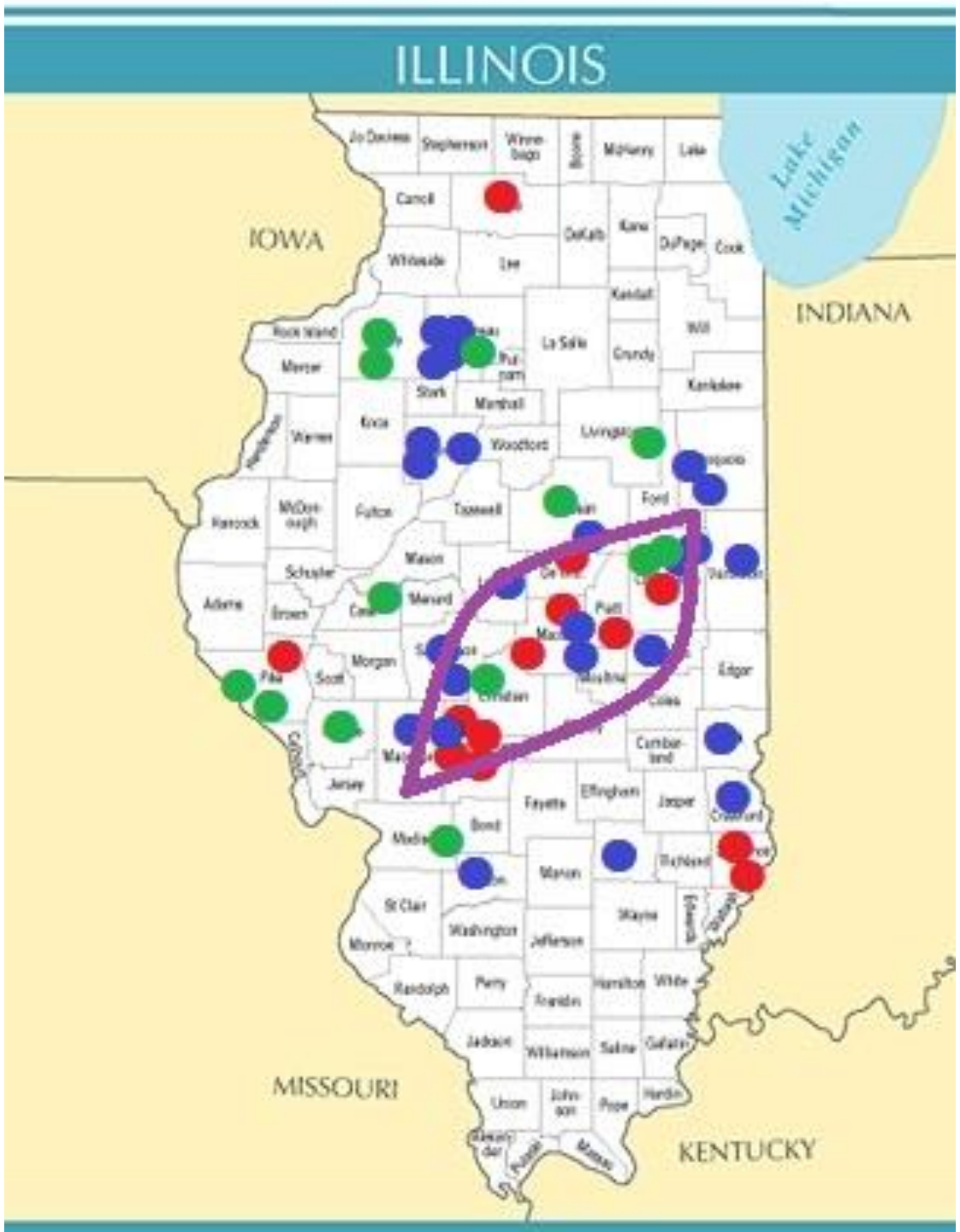
High Yield Zone



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Yields by Region

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Yields by Region

95.15 bpa

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Yields by Region

97.32 bpa

95.15 bpa

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Yields by Region

97.32 bpa

95.15 bpa

95.92 bpa

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Yields by Region

97.32 bpa

79.18 bpa

95.15 bpa

95.92 bpa

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In 2012, your Illinois Soybean Association (ISA) checkoff program established a goal of utilizing (producing and selling) 600 million bushels of Illinois soybeans by 2020 — a 25% increase over typical soybean levels of that time. While many felt soybean yields had plateaued, the ISA Board believed our farmers could increase yields and generate better profits with smarter, more intensive management and the latest technology.

To help accomplish that goal, ISA started funding a first-of-its-kind study to look more holistically at intensive soybean management — to identify if better management leads to better yields and determine which of those practices are most critical to success.

After five years of research, we're pleased to share this summary of the Six Secrets of Soybean Success.

6 Secrets of Soybean Success

WHAT FIVE YEARS OF RESEARCH HAS TAUGHT US

1. **WEATHER:** The number one influence on soybean yields, but beyond our control
2. **FERTILITY:** Proactive fertilization can boost yields over 60 bushels
3. **FOLIAR PROTECTION:** Fungicides and insecticides protect foliage and prevent yield loss
4. **GENETICS:** The fullest maturities for the region produce the greatest yield increases
5. **ROW SPACING:** Narrower, 15- or 20-inch rows increase yield and respond better to more intense management
6. **SEED TREATMENT:** Early season protection protects yield potential

Fred E. Below, Ph.D., is a professor of crop physiology in the Department of Crop Sciences at the University of Illinois. His research is focused on understanding factors limiting crop productivity, particularly corn and soybeans. He is author or co-author on more than 85 peer-reviewed manuscripts, numerous abstracts, book and proceedings chapters, and he has advised more than 65 graduate and postdoctoral students. He developed the "Seven Wonders of The Corn Yield World" and the "Six Secrets of Soybean Success" as tools to teach farmers and agricultural professionals the value of their individual crop management decisions, and he has been actively using these concepts to develop cropping systems capable of sustainably producing high corn and soybean yields.

FRED E. BELOW, PH.D
Professor of Crop Physiology, University of Illinois

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- **Weather**
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- **Foliar Protection**
- **Weed Control Practice**
- **Tillage**

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What is the P1, K, pH???

- We don’t know!
- Questions on Entry Forms asked:
  - Fall application?
  - Spring application?
  - Starter used?
  - Manure applied?
  - Even then, no consistency from our survey to account for nutrient levels

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Fertilizer Applications

Manure used?	Yes = 15%	98.11 bpa
	No = 85%	95.24 bpa
Fall application?	Yes = 79%	95.69 bpa
	No = 21%	95.19 bpa
Spring application?	Yes = 31%	91.77 bpa
	No = 69%	96.13 bpa

* From all responding entry forms

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Fertilizer Applications

Both Fall & Spring?	93.09 bpa
Neither season	96.70 bpa
All 3 times (incl. Starter)	93.84 bpa
No fertilizer application at all	88.90 bpa

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Seed Treatments

Seed Inoculant Used	Yes = 53%	95.95 bpa
	No = 47%	94.23 bpa
Seed Fung / Insecticide	Yes = 84%	96.37 bpa
	No = 16%	88.53 bpa
Seed Nematicide	Yes = 27%	98.54 bpa
	No = 73%	93.85 bpa

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Foliar Applications

Foliar Fungicide Used	Yes = 90%	96.93 bpa
	No = 10%	83.44 bpa
Foliar Insecticide Used	Yes = 83%	96.67 bpa
	No = 17%	90.61 bpa
Foliar Stack Used	Yes = 70%	95.10 bpa
	No = 30%	97.09 bpa

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Weed Control Practices

Pre-Emergence Herbicide Used (all conducted a post-emerge appl)	96.85 bpa
No Pre-Emergence Herbicide Used	88.91 bpa
Burndown only w/ Post trip	89.24 bpa

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Weed Control Practices

Widest Used Post Emerge Chemistries

Glyphosate	50% of respondents
Key non-Glyphosate	37% of respondents
Dicamba	41% of respondents

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Tillage Practices

Fall Tillage Used	Yes = 85%	97.80 bpa
	No = 15%	84.10 bpa
Spring Tillage Used	Yes = 68%	97.09 bpa
	No = 32%	92.92 bpa
Fall Tillage Only	23%	96.85 bpa
Spring Tillage Only	6%	86.74 bpa
Strip-Till Only	19%	85.71 bpa

* Notes: 1 – No-Till (83.70 bpa)
2 – Minimum-Till (95.25 bpa, one grower)

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Genetics

• All Brands Avg	95.30 bpa
• Brand A	96.52 bpa
• Brand B	96.30 bpa
• Brand C	85.47 bpa
• Brand D	96.77 bpa
• Brand E	96.74 bpa
• Brand F	95.50 bpa
• Brand G	90.83 bpa
• Misc Brands (6)	97.66 bpa

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Row Spacing

42 Respondents Avg	94.96 bpa
7.5″ Rows (3)	81.59 bpa
10″ Rows (1)	95.68 bpa
15″ Rows (15)	95.16 bpa
20″ Rows (6)	98.94 bpa
30″ Rows (17)	95.70 bpa

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Planting Population

39 Respondents Avg	95.30 bpa
>120k (3)	95.45 bpa
125k (6)	100.22 bpa
130k (3)	98.54 bpa
135k (4)	104.93 bpa
140k (10)	92.95 bpa
140-155k (5)	95.18 bpa
160k (5)	92.33 bpa
+165k (3)	84.24 bpa

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Planting Dates

Avg Plant Date 4/28/2018 (38)	94.42 bpa
3/22 – 4/2 (3)	93.64 bpa
4/22 – 4/26 (12)	98.96 bpa
4/28 – 4/29 (11)	96.25 bpa
5/1 – 5/8 (5)	91.23 bpa
5/10 – 5/20 (7)	86.39 bpa
	(incls a 108.31)
	(82.74 bpa)

* Note – 3/22 - 4/2 yields: 103.19, 102.5, 75.24

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Crop Rotation

2016 / 2017 / 2018

42 Respondents Averaged 96.77 bpa

Soybeans / Corn / Soybeans	48%	95.66 bpa
Corn / Corn / Soybeans	43%	97.73 bpa
Corn / Soybeans / Soybeans	9%	98.03 bpa

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Maturity Groups

41 Entries averaged 95.91 bpa

2.9	(2)	90.58 bpa	
3.0	(4)	96.58 bpa	
3.1	(2)	95.36 bpa	
3.2	(1)	106.28 bpa	
3.3	(1)	87.47 bpa	
3.4	(3)	98.83 bpa	
3.5	(2)	98.29 bpa	
3.6	(10)	98.25 bpa	
3.7	(3)	96.70 bpa	
3.8	(4)	95.07 bpa	
3.9	(6)	96.84 bpa	
4.2	(2)	90.67 bpa	
4.3	(1)	72.07 bpa	

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Maturity Groups

40 Entries averaged 96.57 bpa

Lower 14	96.69 bpa
Middle 14	97.43 bpa
Higher 13	95.22 bpa

* Removing the 4.3 @ 72.07 bpa

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Maturity Groups

38 Entries averaged 96.83 bpa

2.9 – 3.3 (10)	95.19 bpa
3.4 – 3.6 (15)	98.37 bpa
3.7 – 3.9 (13)	96.26 bpa

* Removing the 4.2s & the 4.3

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ISA Approved Verifiers

Gary Baumhardt, Normal
Bill Brink, Edwardsville
Dennis Epplin, Mt. Vernon
Ted Huber, Oakland
Lyle Paul, DeKalb
Larry Schahl, Lincoln

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Thank You

Yield Challenge Participants
Promoters and Sponsors
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What's Coming in 2019??

Please participate in the Yield Challenge, and encourage your peers to do so, as well !!!

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