SOYBEAN MANAGEMENT
LESSONS LEARNED
FROM THE 2018
ILLINOIS YIELD
CHALLENGE

Bob Wells
Challenge Coordinator
Bement Illinois

Fluid Fertilizer Forum
February 19, 2019
Phoenix Arizona
1994

“If you have 100 farmers in a room, you will have 110 different ways to farm.”
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”
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”
MEY
Maximum Economic Yield
YIELD
2018 Yields
2018 Yields

U.S. Avg – 51.8 bpa
2018 Yields

U.S. Avg – 51.8 bpa
Illinois Avg – 65+ bpa
2018 Yields

U.S. Avg – 51.8 bpa
Illinois Avg – 65+ bpa
Cent IL Counties – 80+ bpa avg?
2018 Yields

U.S. Avg – 51.8 bpa
Illinois Avg – 65+ bpa
Cent IL Counties – 80+ bpa avg?
Randy Dowdy (GA) – 156.84 bpa
2018 Yields

U.S. Avg – 51.8 bpa
Illinois Avg – 65+ bpa
Cent IL Counties – 80+ bpa avg?
Randy Dowdy (GA) – 156.84 bpa
(irrigated / down from 2016 171.8 bpa)
2018 Yields

U.S. Avg – 51.8 bpa
Illinois Avg – 65+ bpa
Cent IL Counties – 80+ bpa avg?
Randy Dowdy (GA) – 156.84 bpa
 (irrigated / down from 2016 171.8 bpa)
Nebraska grower – 138 bpa
 (dryland)
<table>
<thead>
<tr>
<th>Name</th>
<th>Yield</th>
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<tbody>
<tr>
<td>Anonymous</td>
<td>121.67</td>
</tr>
<tr>
<td>Paul Klein (State 100)</td>
<td>110.94</td>
</tr>
<tr>
<td>Ken Elmore (Reg. 3)</td>
<td>108.31</td>
</tr>
<tr>
<td>Joe Klein</td>
<td>106.28</td>
</tr>
<tr>
<td>Dan Luepkes (Reg. 1)</td>
<td>103.46</td>
</tr>
<tr>
<td>Duane Noland</td>
<td>102.50</td>
</tr>
<tr>
<td>Marc Padrutt</td>
<td>101.07</td>
</tr>
<tr>
<td>Chuck Walsh (Reg. 2)</td>
<td>112.48</td>
</tr>
<tr>
<td>Greg McClure (St. Irr.)</td>
<td>110.19</td>
</tr>
<tr>
<td>Cameron McClure (Irr.)</td>
<td>108.06</td>
</tr>
<tr>
<td>Greg McClure (dryland)</td>
<td>105.18</td>
</tr>
<tr>
<td>Edward Logan</td>
<td>103.19</td>
</tr>
<tr>
<td>Tom Elmore</td>
<td>101.89</td>
</tr>
<tr>
<td>Travis Rovey (2)</td>
<td>100.78</td>
</tr>
<tr>
<td>Name</td>
<td>Yields</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Don Dugan</td>
<td>99.25</td>
</tr>
<tr>
<td>Luke &amp; Eric Heaton</td>
<td>97.46</td>
</tr>
<tr>
<td>Dick Haas (3)</td>
<td>96.98</td>
</tr>
<tr>
<td>Grant Strom (2)</td>
<td>96.65</td>
</tr>
<tr>
<td>Cory Utterback</td>
<td>95.88</td>
</tr>
<tr>
<td>Michael Denton (3)</td>
<td>95.01</td>
</tr>
<tr>
<td>Robert Lakey (2)</td>
<td>91.95</td>
</tr>
<tr>
<td>Bryan Severs</td>
<td>91.40</td>
</tr>
<tr>
<td>Mark Kannmacher</td>
<td>90.84</td>
</tr>
<tr>
<td>Matt Krausz (Reg. 4)</td>
<td>90.22</td>
</tr>
<tr>
<td>Kelsey Schwab</td>
<td>90.00</td>
</tr>
</tbody>
</table>
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
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
100+ Bu Yields
90+ Bu Yields
80+ Bu Yields
High Yield Zone
Yields by Region
Yields by Region

97.32 bpa

95.15 bpa

95.92 bpa

79.18 bpa
In 2012, your Illinois Soybean Association (ISA) checkoff program established a goal of achieving a 20% increase over typical soybean yields by 2017. Many felt that soybean yields would plateau, but the ISA Board of Directors believed our farmers could increase yields and generate better profits with greater management, more intensive management and new technology.

To help accomplish that goal, ISA started funding a five-year, field study to look more holistically at intensive soybean management—to identify if better management leads to better yields and determine which of these practices were most critical to success.

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

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. Bistner, 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 soybean. He is author or co-author on more than 85 peer-reviewed manuscripts, numerous articles, book and proceedings chapters, and he has added more than 65 graduate and postdoctoral students. He developed the “Seven Wonders of the Corn Yield That” and the “Six Secrets of Soybean Success” 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.
1. Weather
2. Fertility
3. Seed Treatment
4. Foliar Protection
5. Weed Control Practice
6. Tillage
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
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
# Fertilizer Applications

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manure used?</td>
<td>15%</td>
<td>98.11 bpa</td>
</tr>
<tr>
<td>Fall application?</td>
<td>79%</td>
<td>95.69 bpa</td>
</tr>
<tr>
<td>Spring application?</td>
<td>31%</td>
<td>91.77 bpa</td>
</tr>
</tbody>
</table>

* From all responding entry forms
Fertilizer Applications

Both Fall & Spring? 93.09 bpa
Starter only 96.70 bpa
All 3 times (incl. Starter) 93.84 bpa
No fertilizer application at all 88.90 bpa
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
## Seed Treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>BPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed Inoculant Used</td>
<td>53</td>
<td>47</td>
<td>95.95</td>
</tr>
<tr>
<td>Seed Fung / Insecticide</td>
<td>84</td>
<td>16</td>
<td>96.37</td>
</tr>
<tr>
<td>Seed Nematicide</td>
<td>27</td>
<td>73</td>
<td>98.54</td>
</tr>
</tbody>
</table>

BPA stands for Bushel Per Acre.
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
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
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
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
Weed Control Practices

Widest Used Post Emerge Chemistries

- Glyphosate: 50% of respondents
- Key non-Glyphosate: 37% of respondents
- Dicamba: 41% of respondents
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
## Tillage Practices

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yes</th>
<th>No (%)</th>
<th>Yield (bpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Tillage Used</td>
<td>85%</td>
<td>15%</td>
<td>97.80</td>
</tr>
<tr>
<td>Spring Tillage Used</td>
<td>68%</td>
<td>32%</td>
<td>97.09</td>
</tr>
<tr>
<td>Fall Tillage Only</td>
<td></td>
<td>23%</td>
<td>96.85</td>
</tr>
<tr>
<td>Spring Tillage Only</td>
<td></td>
<td>6%</td>
<td>86.74</td>
</tr>
<tr>
<td>Strip-Till Only</td>
<td></td>
<td>19%</td>
<td>85.71</td>
</tr>
</tbody>
</table>

* Notes: 1 – No-Till (83.70 bpa)  
  2 – Minimum-Till (95.25 bpa, one grower)
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
- Weather
- Fertility
- Seed Treatment
- Foliar Protection
- Weed Control Practice
- Tillage
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
# Row Spacing

<table>
<thead>
<tr>
<th>Row Spacing</th>
<th>Number of Rows</th>
<th>Average Yield (bpa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5”</td>
<td>3</td>
<td>81.59</td>
</tr>
<tr>
<td>10”</td>
<td>1</td>
<td>95.68</td>
</tr>
<tr>
<td>15”</td>
<td>15</td>
<td>95.16</td>
</tr>
<tr>
<td>20”</td>
<td>6</td>
<td>98.94</td>
</tr>
<tr>
<td>30”</td>
<td>17</td>
<td>95.70</td>
</tr>
</tbody>
</table>

42 Respondents Avg 94.96 bpa
## Planting Population

<table>
<thead>
<tr>
<th>Population Range</th>
<th>Respondents</th>
<th>Average BPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;120k</td>
<td>3</td>
<td>95.45 bpa</td>
</tr>
<tr>
<td>125k</td>
<td>6</td>
<td>100.22 bpa</td>
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<tr>
<td>130k</td>
<td>3</td>
<td>98.54 bpa</td>
</tr>
<tr>
<td>135k</td>
<td>4</td>
<td>104.93 bpa</td>
</tr>
<tr>
<td>140k</td>
<td>10</td>
<td>92.95 bpa</td>
</tr>
<tr>
<td>140-155k</td>
<td>5</td>
<td>95.18 bpa</td>
</tr>
<tr>
<td>160k</td>
<td>5</td>
<td>92.33 bpa</td>
</tr>
<tr>
<td>+165k</td>
<td>3</td>
<td>84.24 bpa</td>
</tr>
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## Planting Dates

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Avg Yields</th>
<th>bpa</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/22 – 4/2</td>
<td>93.64</td>
<td>bpa</td>
</tr>
<tr>
<td>4/22 – 4/26</td>
<td>98.96</td>
<td>bpa</td>
</tr>
<tr>
<td>4/28 – 4/29</td>
<td>96.25</td>
<td>bpa</td>
</tr>
<tr>
<td>5/1 – 5/8</td>
<td>91.23</td>
<td>bpa</td>
</tr>
<tr>
<td>5/10 – 5/20</td>
<td>86.39</td>
<td>bpa</td>
</tr>
<tr>
<td></td>
<td>(incls a 108.31)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(82.74 bpa)</td>
<td></td>
</tr>
</tbody>
</table>

*Note – 3/22 - 4/2 yields: 103.19, 102.5, 75.24*
Crop Rotation
2016 / 2017 / 2018

42 Respondents Averaged 96.77 bpa

<table>
<thead>
<tr>
<th>Rotation</th>
<th>Percentage</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybeans / Corn / Soybeans</td>
<td>48%</td>
<td>95.66 bpa</td>
</tr>
<tr>
<td>Corn / Corn / Soybeans</td>
<td>43%</td>
<td>97.73 bpa</td>
</tr>
<tr>
<td>Corn / Soybeans / Soybeans</td>
<td>9%</td>
<td>98.03 bpa</td>
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</tbody>
</table>
Maturity Groups

41 Entries averaged 95.91 bpa

<table>
<thead>
<tr>
<th>Maturity Group</th>
<th>Average</th>
<th>Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9 (2)</td>
<td>90.58 bpa</td>
<td></td>
</tr>
<tr>
<td>3.0 (4)</td>
<td>96.58 bpa</td>
<td></td>
</tr>
<tr>
<td>3.1 (2)</td>
<td>95.36 bpa</td>
<td></td>
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<tr>
<td>3.2 (1)</td>
<td>106.28 bpa</td>
<td></td>
</tr>
<tr>
<td>3.3 (1)</td>
<td>87.47 bpa</td>
<td></td>
</tr>
<tr>
<td>3.4 (3)</td>
<td>98.83 bpa</td>
<td></td>
</tr>
<tr>
<td>3.5 (2)</td>
<td>98.29 bpa</td>
<td></td>
</tr>
<tr>
<td>3.6 (10)</td>
<td>98.25 bpa</td>
<td></td>
</tr>
<tr>
<td>3.7 (3)</td>
<td>96.70 bpa</td>
<td></td>
</tr>
<tr>
<td>3.8 (4)</td>
<td>95.07 bpa</td>
<td></td>
</tr>
<tr>
<td>3.9 (6)</td>
<td>96.84 bpa</td>
<td></td>
</tr>
<tr>
<td>4.2 (2)</td>
<td>90.67 bpa</td>
<td></td>
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<tr>
<td>4.3 (1)</td>
<td>72.07 bpa</td>
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</table>
### Maturity Groups

40 Entries averaged 96.57 bpa

<table>
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<tr>
<th>Group</th>
<th>BPA</th>
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<tbody>
<tr>
<td>Lower 14</td>
<td>96.69 bpa</td>
</tr>
<tr>
<td>Middle 14</td>
<td>97.43 bpa</td>
</tr>
<tr>
<td>Higher 13</td>
<td>95.22 bpa</td>
</tr>
</tbody>
</table>

* Removing the 4.3 @ 72.07 bpa
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
What’s Coming in the Future??

National Contest?

Higher Yields??
Thank You
To the
Fluid Fertilizer Foundation