Section 1
Baseline/General Information

How did you last recertify?
(1223 responses SW, SE, C and SC)
What is your age? (855 SW, C, and SE responses)

How many years have you been farming? (473 SW, and SE responses)

How many acres do you farm? (866 SW, C, and SE responses)

Do you use a “MOBILE DEVICE” to access the Internet? (217 responses SE)
Do you use a Smart Phone/Tablet on your farm?
(676 responses SW, and SE)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Planning to in the near future</th>
</tr>
</thead>
<tbody>
<tr>
<td>46%</td>
<td>47%</td>
<td>7%</td>
</tr>
</tbody>
</table>

What type of records do you keep?
(~538 SW, C & SE responses)

- History of Pest infestations (disease/weeds/insects)
- Pesticides used and rates
- Other pest control methods
- Crop Varieties/Brands and traits
- Problem areas - Maps
- Yield Maps
- Soil Test/Grid Sampling results

What types of records do you keep?
(~219 responses SE)

- History of Pest infestations (disease/weeds/insects)
- Pesticides used and rates
- Other pest control methods
- Crop Varieties/Brands and traits
- Problem areas - Maps

What types of records do you keep?
(~757 SW, C & SE responses)*

- History of Pest infestations (disease/weeds/insects)
- Pesticides used and rates
- Other pest control methods
- Crop Varieties/Brands and traits
- Problem areas - Maps

*Note: “Yield Map” & “Soil Test/Grid Sample” options omitted to allow combining
Section 2
Weed Management

How many acres of Alfalfa do you raise?
(428 responses SE)

What other crops do you raise on your farm?
(Could select >1: 330 responses SE)

For Weed Control I Primarily:
(679 responses SW, SE C & SC)
Do you map spots and/or infestations in your field? (816 SW, C & SE responses)

When do you control volunteer corn in your soybeans? (199 responses SE)

When do you control volunteer corn in your soybeans? (173 responses SE)

Does glyphosate perform as well today as it did when you first used it? (610 SW, C, SE responses)
Do you think you have glyphosate resistant weeds on your farm? (496 responses SE & C)

![Pie chart showing 66% Yes and 34% No]

Which weed species do you suspect are resistant to glyphosate? (102 responses SE)

- Common lambsquarters: 16%
- Giant ragweed: 42%
- Nightshade species: 2%
- Waterhemp species: 29%
- Velvetleaf: 5%
- Common Cocklebur: 2%
- Common Ragweed: 2%

Which weed species do you suspect are resistant to glyphosate? (192 responses C)

- Common lambsquarters: 31%
- Giant ragweed: 41%
- Nightshade species: 15%
- Waterhemp species: 4%
- Velvetleaf: 3%
- Common Cocklebur: 2%
- Common Ragweed: 4%
- Barnyardgrass: 0%

Note, starting in 2013 "Don't know" was no longer an option.
Which weed species do you suspect are resistant to glyphosate?
(291 responses SE & C-combined)

- Common lambsquarters: 15%
- Giant ragweed: 3%
- Nightshade species: 2%
- Waterhemp species: 4%
- Velvetleaf: 38%
- Common Cocklebur: 1%
- Common Ragweed: 36%

How do you manage weed resistance?
(220 SE responses)

- Preplant herbicide followed: 31%
- Tank mix with additional: 24%
- Not concerned about weed: 2%
- Rotate herbicide mode of: 32%
- Use mechanical control: 10%

Do you plan to use a Pre-emergence Herbicide in Soybeans?
(568 SW, SE, C Responses)

- Yes: 77%
- No: 23%

Do you plan to use Pre-emergence Herbicide in corn?
(785 Responses SW, SE & SC)

- Yes: 79%
- No: 21%
My sprayer uses… (236 responses SE)

- Limited or no Monitor: 27%
- Rate controller: 23%
- Rate controller with swath control: 16%
- Rate and swath control with auto steer: 13%
- Pulse width modulation or other signal: 3%
- Don't have a sprayer: 18%

My sprayer uses… (193 responses SE)

- Limited or no Monitor: 33%
- Rate controller: 28%
- Rate controller with swath control: 20%
- Rate and swath control with auto steer: 16%
- Pulse width modulation or other signal: 3%

When rinsing out the tank between susceptible crops, I usually… (385 SW & C responses)

- Don't rinse out the tank-I make sure the tank is empty: 15%
- Rinse once: 38%
- Rinse twice: 30%
- Rinse three times (triple rinse): 4%
- Rinse >3 times: 1%
- I don't spray my own crops: 6%

When rinsing out the tank between susceptible crops, I usually… (381 SW & C responses)

- Don't rinse out the tank-I make sure the tank is empty: 1%
- Rinse once: 15%
- Rinse twice: 39%
- Rinse three times (triple rinse): 36%
- Rinse >3 times: 4%
When changing from one crop to a susceptible crop, which method best describes how you clean the spray tank?... (390 SW & C responses)

Do you have AUTOMATIC BOOM HEIGHT CONTROL?  
(SE 222 responses)

Do you have AUTOMATIC BOOM HEIGHT CONTROL?  
(SE 181 responses)
MPH for your spraying? (239 responses SE)

What type of nozzle do you usually use? (223 responses SE)

Other: 2%
Chamber/drift reducing: 3%
Cone: 5%
Flood: 7%
Air induction: 25%
Flat Fan: 58%

What type of nozzle do you usually use? (SE)

How many different types of nozzles do you use in a season? (201 SE responses)

- 71% I use the same nozzles all season
- 29% I switch based on pesticide label requirements
- 0% Neither

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Section 3
Insect Management

My crop rotation consists of:
(747 responses SW, SE C & SC)

What percentage of your acres will be corn on corn?
(646 SW, SE and C responses)

You generally plant corn…
(198 C responses)
What percentage of your acres will be corn on corn?

(641 SW, SE, SC responses)

![Graph showing percentage distribution of corn on corn acres](image)

Response % based on those that plant corn

Have you experienced lodging or root damage in your CRW corn?

(822 SW, SE & C responses)

![Graph showing percentage distribution of lodging and root damage](image)

2013 Case Study
Corn Rootworms

- This field was corn on corn for the past 10 yrs and had the same Bt trait (YieldGard Cry3Bb1) for about 5 years. This year it was planted with a Genuity SmartStax RIB (Cry3Bb1 & Cry34/35Ab1).
- Western corn rootworms were very common and out numbered northern corn rootworms by 10 to 1.
- Root feeding and lodging was observed on the corn.
- If you were this grower what would you do?

2014: What would you do?
(responses SW, SE & C)

![Graph showing percentage distribution of actions in 2014](image)

*Question posed after describing scenario of field in corn for 10 years with same Bt trait (YieldGard for past 5 years), and root feeding is observed.
Corn Rootworm Management Options After Unexpected Injury

<table>
<thead>
<tr>
<th>Option</th>
<th>Resistance</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop rotation</td>
<td>*****</td>
<td>Economics, operational demands, viable 3rd crop, extended diapause?</td>
</tr>
<tr>
<td>Plant a non CRW corn w/ insecticide where needed</td>
<td>***</td>
<td>Environmental/health concerns, reduced performance - heavy pressure</td>
</tr>
<tr>
<td>Switch single traits</td>
<td>***</td>
<td>All events could have issues. Primarily VT3 / VT3 Pro now</td>
</tr>
<tr>
<td>Use pyramid traits</td>
<td>*** or **?</td>
<td>Resistance to one trait; less effective refuge, selection pressure continues</td>
</tr>
<tr>
<td>Layer insecticide over pyramid</td>
<td>**</td>
<td>Insurance use of insecticide, benefit ?, Emergence shift, delayed feeding</td>
</tr>
<tr>
<td>Layer insecticide over single trait</td>
<td>**</td>
<td>Masks resistance issues. Benefit only if Bt-RW performance problem.</td>
</tr>
<tr>
<td>Spray CRW beetles</td>
<td>*</td>
<td>Reduces pressure, must spray whole field, multiple sprays needed</td>
</tr>
</tbody>
</table>

2014: What would you do? (Follow-up question after discussing CRW R management options - SE)

- 70% Rotate field to non-host
- 4% Plant non-traited corn with insecticide
- 4% Switch single traited corn brands
- 9% Use pyramid traited corn
- 4% Use soil insecticide on pyramid traited corn
- 4% Use soil insecticide on single traited corn
- 2% Spray adult beetles

16% chose an option that included a pesticide application

*Question posed after describing scenario of field in corn for 10 years with same Bt trait (YieldGard for past 5 years), and root feeding is observed AND talking about CRW resistance issues and best management options

Can you apply insecticide with your corn planter?
(214 Responses SE & C)

- 54% Liquids
- 20% Smart Box
- 17% Granules
- 3% No
- 3% Don't plant corn

Response % based on those that plant corn

Can you apply insecticide with your corn planter?
(208 Responses SW, SE & C)

- 55% Granules
- 21% Liquids
- 18% No
- 6% Smart Box
- 6% Don't plant corn
Has a CRW performance issue been confirmed on your farm?
(125 SE responses)

- Yes: 30%
- No: 70%

Did you scout for Corn Rootworm Beetles in 2013?
(209 SE responses)

- Yes: 46%
- No: 54%

Have you utilized aphid-resistant soybean varieties?
(623 C & SW responses)

- Yes: 49%
- No, but I am aware they are on the market: 26%
- No, I did not know they were available: 15%
- I'm not sure: 10%

Section 4
Disease Management
Do you plant non-resistant Soybean Cyst Nematode (SCN) varieties on your farm as part of your SCN management plan? (41 Responses in SE)

- Don’t plant soybeans: 12%
- Don’t know: 5%
- NO: 37%
- Yes, on some of my acres: 27%
- Yes, on all of my acres: 20%

Have you confirmed SCN infestations on your farm through… (39 SE responses)

- Evaluating roots: 56%
- Soil testing: 13%
- Visual root evaluation AND soil testing: 18%
- I have not confirmed: 13%

Which diseases did you see in your fields this year? (Could select >1 response, ~483 SW, C, SE responses)

- Goss’s Wilt in Corn: 35%
- Common Rust on Corn: 33%
- Other/unsure in corn: 17%
- Sudden Death Syndrome in Soybean: 17%
- Green Stem Syndrome in Soybean: 16%
- White Mold in Soybean: 13%
- Other/unsure in soybean: 7%
Section 5
Pesticide Safety

How many years have you been applying pesticides? (202 in SE)

Are regular glasses ever acceptable eye protection when handling pesticides? (339 C, SC & SE responses)

Who should care most about your eyes? (562 SE, C & SC responses)
How often do you wear eye protection when using pesticides?

(1118 responses SW, SE, C & SC)

- All the time: 34%
- Always when the label requires: 11%
- Sometimes when the label requires: 14%
- Only in high risk situations: 18%
- Seldom/never, even when label requires: 19%
- Don’t use pesticides that require eye protection: 5%
- Don’t use pesticides that require eye protection and don’t use pesticides: 0%

Do you wear the correct safety gloves when making pesticide applications?

(98 SE responses)

- I use the correct gloves for ALL applications: 55%
- I use the correct gloves for SOME applications: 32%
- I don’t wear correct gloves: 13%

For Pest Management I…

(489 responses SW, SE, C & SC)

- Use all the inputs I reasonably can, most are cheap & I want the insurance: 55%
- Scout for some pests but won’t tolerate many: 23%
- Scout for pests and follow U of MN thresholds: 16%
- Scout for pests, follow U of MN thresholds & have a long-term plan that includes non-pesticide tactics: 6%
Have you used a fungicide on your alfalfa? (173 SE responses)

- Yes: 55%
- No: 29%
- I don't grow alfalfa: 16%

Did you get a yield response to using fungicide on your alfalfa? (38 SE responses)

- Yes, I think so: 58%
- No, not sure: 37%
- I don't grow alfalfa: 5%

Have you used a fungicide on your oats? (128 SE responses)

- Yes: 55%
- No: 42%
- I don't grow oats: 3%

If you used a fungicide, on your oats, did you get a Yield response? (3 SE responses)

- Yes, yield increases: 67%
- Yes, yield and test weight increases: 33%
- No: 0%
Regarding “Resistance”....
(SW, SE, C & SC 505 responses)

- Enough already! Talk about a real problem! (53%)
- I will worry about it when I see problems in my own field (31%)
- I am concerned and will use the upcoming new technologies to address the problem (14%)
- I am actively addressing concerns and am looking at ways to do more (10%)
- I am doing everything I can to address resistance issues already (2%)

Do you have a multi-year plan to manage pest resistance on your farm?
(240 SE responses)

- Yes, a five year plan (49%)
- Yes, three-four year plan (32%)
- Yes, two year plan (13%)
- No, I make it up as I go (6%)

Did you plant Cover Crops on your Prevent Plant Acres in 2014? (236 SE responses)

- No (35%)
- Oats (30%)
- Oats, rye-mix (25%)
- Tillage radish (20%)
- Oats/tillage radish mix (15%)
- Alfalfa (10%)
- Other mixture (5%)
- Did not have prevented plant acres (0%)

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