Stakeholder Perspectives on Resistance Management

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Methodology – Our Survey

- 2015 – 20 Respondents
  - Online Qualtrics Survey
  - Reps from ag retail and advising, farmer and commodity associations, pesticide/biotech companies
  - Objective: Understand how stakeholder groups think about pest resistance management

- 2022 – 94 Respondents
  - Online Qualtrics Survey
  - Sent to participants in this meeting
  - Replicate some questions from previous surveys
  - Add some new questions
  - Objective: Understand how this group thinks (differently?) about pest resistance management
Which stakeholder group(s) do you belong to? (Choose all that apply)

<table>
<thead>
<tr>
<th>#</th>
<th>Answer</th>
<th>%</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Farmer</td>
<td>25.53%</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Crop Advisor</td>
<td>12.77%</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Agricultural Retailer</td>
<td>9.57%</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Pesticide Manufacturer</td>
<td>3.19%</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Seed Company</td>
<td>13.83%</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>University Scientist</td>
<td>4.26%</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Extension Educator</td>
<td>4.26%</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Land Management Firm</td>
<td>2.13%</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>Commercial Pesticide Applicator</td>
<td>9.57%</td>
<td>9</td>
</tr>
</tbody>
</table>
Which stakeholder group(s) do you belong to? (Choose all that apply)

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<thead>
<tr>
<th>#</th>
<th>Answer</th>
<th>%</th>
<th>Count</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>Commodity Group</td>
<td>8.51%</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>Government</td>
<td>2.13%</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Non-Governmental Organization (NGO)</td>
<td>2.13%</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Local Community Representatives (i.e. bankers, county commissioner, etc)</td>
<td>2.13%</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Other (please specify)</td>
<td>0.00%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100%</td>
<td>94</td>
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</tbody>
</table>
Methodology – Iowa Farm and Rural Life Poll

• Data from the Iowa Farm and Rural Life Poll
• Annual panel survey of ~1,200 Iowa farmers
• Questions in both 2014 and 2013 surveys
• Farmers who reported corn and/or soybean
• Objective: What do farmers think?
I am concerned that Bt-resistant insects will become a problem in my area/Iowa

Iowa Farm and Rural Life Poll

2015 Meeting:
- 5% Disagree
- 5% Uncertain
- 90% Agree

2022 Meeting:
- 7% Disagree
- 9% Uncertain
- 84% Agree
I am concerned that herbicide-resistant weeds will become a problem in my area

Iowa Farm and Rural Life Poll

<table>
<thead>
<tr>
<th>Disagree/Strongly Disagree</th>
<th>Uncertain</th>
<th>Agree/Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td>12%</td>
<td>82%</td>
</tr>
</tbody>
</table>

2022 Meeting

<table>
<thead>
<tr>
<th>Disagree/Strongly Disagree</th>
<th>Uncertain</th>
<th>Agree/Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2%</td>
<td>7%</td>
<td>91%</td>
</tr>
</tbody>
</table>

2015 Meeting:
- 0% Disagree
- 5% Uncertain
- 95% Agree
I am concerned that fungicide-resistant pathogens will become a problem in my area.
Bt-resistant insect pests are not a major concern because new technologies will be developed to manage them.

**2015 Meeting:**
- 90% Disagree
- 5% Uncertain
- 5% Agree

**2022 Meeting:**
- 84% Disagree
- 14% Uncertain
- 2% Agree/Strongly Agree
Herbicide-resistant weeds are not a major concern because new technologies will be developed to manage them.

**Iowa Farm and Rural Life Poll**

- **Disagree/Strongly Disagree**: 64%
- **Uncertain**: 22%
- **Agree/Strongly Agree**: 14%

**2022 Meeting**

- **Disagree/Strongly Disagree**: 89%
- **Uncertain**: 9%
- **Agree/Strongly Agree**: 2%

**2015 Meeting:**
- 95% Disagree
- 5% Uncertain
- 0% Agree
Fungicide-resistant pathogens are not a major concern because new technologies will be developed to manage them.
I feel like pest (weed, disease, and insect) management is a never-ending technology treadmill

Iowa Farm and Rural Life Poll

2022 Meeting

2015 Meeting:
• 20% Disagree
• 15% Uncertain
• 65% Agree
When new pest management technologies are introduced, it is only a matter of time before pests evolve resistance.

Iowa Farm and Rural Life Poll

- Disagree/Strongly Disagree: 3%
- Uncertain: 15%
- Agree/Strongly Agree: 82%

2015 Meeting:
- 25% Disagree
- 10% Uncertain
- 65% Agree

2022 Meeting:
- 7% Disagree
- 20% Uncertain
- 75% Agree
The way that farmers use pest management technologies does not really impact the rate at which resistance evolves.

Iowa Farm and Rural Life Poll

- 67% Disagree/Strongly Disagree
- 18% Uncertain
- 15% Agree/Strongly Agree

2015 Meeting:
- 95% Disagree
- 5% Uncertain
- 0% Agree

2022 Meeting:
- 91% Disagree/Strongly Disagree
- 4% Uncertain
- 5% Agree/Strongly Agree
Realistically, the ONLY thing that can effectively manage pest resistance problems is the development of new pesticides/products.
Pest resistance can be effectively managed by single farmers, i.e. without cooperation among farmers in a community.
Pest resistance can be effectively managed by farmers alone, i.e. without cooperation from other non-farmer stakeholders.
How important are the following sources of information for developing pest resistance management approaches for your farming operation?

• Extremely Important
  • Fertilizer or Ag Chemical Dealer
  • Private Crop Consultant
  • ISU Extension
  • Family or Co-Owners

• Very Important
  • Seed Dealers
  • Other Growers

• Moderately Important
  • USDA/NRCS/SWCD
  • Other Growers
  • Commodity Organization
  • Farmer Organization

• Unimportant
  • USDA/NRCS/SWCD
  • Commodity Organization

2015 Meeting:
• Fertilizer or Ag Chemical Dealer
• Seed Dealer
• Private Crop Consultant
How much responsibility do each of the following bear in efforts to reduce the evolution of resistance?

- **Much Responsibility**
  - Farmers
  - Crop Advisors
  - Pesticide Manufacturers
  - Ag Retailers
  - Seed Companies
  - University Scientists

- **Some Responsibility**
  - Government (e.g. EPA, USDA)
  - Land Management Firms
  - Commercial Applicators

- **Little Responsibility**
  - Commodity Groups

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2015 Meeting:
- Farmers
- Crop Advisors
- Ag retailers
- Pesticide Manufacturers
Which of the following groups do you believe bears the most responsibility to manage resistance evolution?

- Farmers
- Crop Advisors
- Ag Retailers
- Pesticide Manufacturers
- Seed Companies
- Land Management Firms
- Commercial Applicators
- Government
- Extension Education
- Local Community Representatives (bankers, commissioners, etc.)
Summary

• Concern
  • Highest to Lowest: Weeds → Insects → Pathogens
  • Concern highest in 2015 and 2022 meetings

• Confidence in New Tech
  • Highest in Iowa Farm and Rural Life Poll
  • Then 2022, then 2015
  • How do we define tech? Impact of respondent roles?

• Collective Management
  • 1 farmer alone not effective
  • Just farmers somewhat effective

• Information Sources
  • Fertilizer or Ag Chemical Dealer
  • Private Crop Consultant
  • ISU Extension
  • Family or Co-Owners

• Who’s Problem?
  • Farmers
  • Crop Advisors
  • Pesticide Manufacturers
  • Ag Retailers
  • Seed Companies