Managing Herbicide Resistance: Listening to the Perspectives of the Practitioners

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Managing Herbicide Resistance: Listening to the Perspectives of the Practitioners.

Jill Schroeder, USDA Office of Pest Management Policy;
David Shaw, Mike Barrett, David Ervin, Amy Asmus, Ray Jussaume, Harold Coble
The Listening Session Regional Coordinators and HR Education Committee Members
A little history of our efforts -
Herbicide Resistance Summit I 2012
sponsored by the National Research Council (NAS)

- Goal
  - Catalyze action
  - Foster collaboration
- Summarized two publications on resistance
- Explored scientific basis of herbicide resistance
- Considered perspectives on ways to overcome herbicide resistance
  - Best Management Practices
  - Opportunities
  - Barriers

http://nas-sites.org/hr-weeds-summit/
Insanity....

*Doing the same thing over and over again and expecting a different result.*

Albert Einstein
Herbicide Resistance Evolution

- A biology problem
- A technology problem
- A HUMAN problem

“Sole reliance on education, technical assistance, and other incentives aimed at changing individual grower behavior likely will fail to stem the advance of HR.”

What we do Next?

- We either have to do something “different” or accept that we are insane.
- The human dimension *MUST* come into play, and be integrated with biology, to guide strategies from here forward.
- Considerations from a social science standpoint.
National Summit II: Strategies to Manage Herbicide-Resistant Weeds
September 2014

- Understanding the socio-economic dimensions of the problem
- Moving to more systems-based solutions
- Re-evaluate what we have been doing that has NOT worked
- Every group has a role to play!

http://wssa.net/wssa/weed/resistance-summit-ii/
Horror beyond Understanding!

Attack of the Wicked Problem!

Undefinable! Unknowable! Unstoppable!
What is a “Wicked” Problem?

- No definitive formulation
- No final solution
- No true/false or good/bad answers
- No definitive solution set
- Every wicked problem unique
- Multiple potential and viable causes
- Intolerance for ineffective solutions
What next to address the Wicked Problem?

Seven regional **listening sessions** were held to bring in perspectives on herbicide resistance from different geographies and cropping systems.

- Improve understanding of who are the stakeholders.
- Improve understanding of regional diversity regarding issues and solutions.
- Identification of stakeholder wants and needs.
- Identification of needed next steps by organizers.

Listening Sessions Funded by: USDA-APHIS, USB, WSSA
Why Listening Sessions?

- We *told* everyone what they needed to do - and the problem continues to increase!!!!
  - We still do not fully understand the nature of the problem - why aren’t things changing?
- Until you truly understand the problem, you can’t find solutions.
Regions selected for the Listening Sessions
<table>
<thead>
<tr>
<th>Region/States</th>
<th>Date/Location</th>
<th>Coordinators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MidSouth</strong></td>
<td>December 5, 2016</td>
<td>Darrin Dodds (MSU)</td>
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<tr>
<td>MO, TN, AR, MS, LA</td>
<td>Starkville, MS</td>
<td>Larry Steckel (UTN)</td>
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<td><strong>Northeast</strong></td>
<td>January 18, 2017</td>
<td>Bill Curran (PSU)</td>
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<tr>
<td>PA, MD, DE, NY, VA, WV</td>
<td>Lancaster, PA</td>
<td>Mark VanGessel (UMD)</td>
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<td></td>
<td></td>
<td>Annie Klodd (PSU)</td>
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<td><strong>Northwest</strong></td>
<td>January 24, 2017</td>
<td>Ian Burke (WSU)</td>
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<tr>
<td>WA, OR, ID, MT, UT, NV</td>
<td>Pasco, WA</td>
<td>Don Morishita (UID)</td>
</tr>
<tr>
<td><strong>Southwest</strong></td>
<td>February 15, 2017</td>
<td>Brad Hanson (UC - Davis)</td>
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<tr>
<td>CA, AR, NM</td>
<td>Tulare, CA</td>
<td>Brian Schutte (NMSU)</td>
</tr>
<tr>
<td><strong>Great Plains</strong></td>
<td>February 17, 2017</td>
<td>Phil Stahlman (KSU)</td>
</tr>
<tr>
<td>KS, NE, CO, WY, MT</td>
<td>Holyoke, CO</td>
<td>Todd Gaines (CSU)</td>
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<td></td>
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<td>Andrew Kniss (UWY)</td>
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<td></td>
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<td>Cody Creech (UNB)</td>
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<td></td>
<td></td>
<td>Prashant Jha (MSU)</td>
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<tr>
<td></td>
<td></td>
<td>Sandra McDonald (Mountain West PEST)</td>
</tr>
<tr>
<td><strong>Midwest</strong></td>
<td>March 4, 2017</td>
<td>Christy Sprague (MSU)</td>
</tr>
<tr>
<td>IA, IL, IN, KS, KY, MI, MN, MO, NC,ND, NE, OH, SD, TN and WI</td>
<td>San Antonio, TX</td>
<td>Jeff Gunsolus (UMN)</td>
</tr>
<tr>
<td><strong>Southeast</strong></td>
<td>March 30, 2017</td>
<td>Ramon Leon (UFL)</td>
</tr>
<tr>
<td>GA, FL, NC, SC, AL</td>
<td>Waynesboro, GA</td>
<td>Stanley Culpepper (UGA)</td>
</tr>
</tbody>
</table>
Participants

- Method of developing invitation list varied by region
  - Based on regional characteristics, location, other events, demographics
- Number of attendees varied from 40 to nearly 180 individuals.
- Participants represented the region’s agricultural sector primarily
  - Growers
  - Consultants
  - Retailers
  - Extension
- Other groups included private industry, state/county agencies, DOT, commodity and farm organizations, BLM....
Listening Sessions Agenda

- Facilitated meeting (Strategic Conservation Solutions, LLC)
- Agenda
  - Setting the stage with stakeholder perspectives
  - Table discussion of personal perspectives regarding HR
    - Defining level of concern about HR
    - Level of concern about spread of HR weeds
    - Describing the challenge of HR
  - Table discussion about managing HR
    - Challenges and barriers
    - Experiences and successes
    - Wants and needs
  - New perspectives and recommendations
Information obtained from each listening session

- Table notes from discussions
  - Individual participant notes
  - Table host summary notes
- Participant evaluations
- WSSA committee notes of report outs
- Flip chart notes from report outs
- Recordings of report outs
  - Only for verification
What did we learn?
Messages we heard in the Listening Sessions

- **Theme 1:** We need new herbicides and new herbicide MOAs
  
  [Why adopt resistance-management practices if you believe new herbicides will soon be available?]

  - Regulatory red tape
  - Cost/time to register
Messages we heard:

- **Theme 2: There is no need for more regulation!**

  *Can the threat of regulation motivate changes in behavior?*

  - Regulation was perceived as a barrier to new technologies.
  - NE was the only region that indicated that regulation could be part of the solution.
  - Concern for Palmer amaranth invasion
Messages we heard:

- **Theme 3**: There is a need for more education - especially for “others”

  *Non-chemical management approaches are under-supplied by the private sector*

  - Clarification needed: “old/new” chemistry registered on a new crop vs a new MOA.
  - Education about herbicides vs non-chemical methods
    - How to incorporate both into production system
  - Need for more communication and collaboration between ALL stakeholders
    - Consistent messaging
BM1
Barrett, Michael, 11/19/2017

BM [2]1  Jill - should we add a comment about education for "others"
Barrett, Michael, 11/19/2017
Messages we heard:

▶ Theme 4: Diversity is hard

*New herbicides fit more easily in current agricultural structure - but growers have been known to make needed changes*

▶ Growers expressed concern about the lack of profitable alternative crops and/or challenges in using cover crops
  ▶ Economics
  ▶ Equipment needs
  ▶ Conservation program requirements

▶ Immediacy of issue influences response to educational efforts.
Messages we heard:

Theme 5: The current agricultural economy makes it difficult to do things differently

[Farmers are tempted to delay adoption of HR costs]

- Lack of affordable financing
  - Low commodity prices
- Lack of understanding of long term economic impacts of HR and HRM.
- Land ownership
- Resource availability
- Need for incentives
- Economics of diversification of practices
- Economics may guide research directions
Jill - I think it is important to relay that even though this was said, the truth is farmers were not changing practices even when crop prices were very good.

Barrett, Michael, 11/19/2017
Messages we heard:

- **Theme 6**: We are aware of HR but are managing it and we are not in a panic.  
  *If they believe that a new herbicide is coming, they will be less likely to be concerned.*

- The attitude appears to be different between farmers and weed scientists.
  - 95% agreed that HR is a problem
  - 95% agreed that spreading HR weeds from field to field is a problem.
  - 80% concerned about county to county or region to region spread.

- Concern was raised about the possibility of multiple resistance or resistance to alternative herbicides.
The comment/question I would raise here is whether we have reached a panic tipping point - that the attitude and concern may be very different between growers and weed scientists.

Barrett, Michael, 11/19/2017
What have we achieved?
We gained ground level intelligence on HR conditions.

We have a framework of stakeholders from producers, industry reps. to regulatory agents and from weed scientists to social scientists who are now working together on HR.

Recognition of HR as a problem is widespread in the agricultural community in the U.S.

Weed Scientists have begun to talk about the human dimension of HR.
The listening sessions are an example of a different approach to provide outreach.

Many participants expressed a desire for more sessions with a similar format.
What needs to be done next?

Attack of the Wicked Problem!
So what is next? - Questions for your consideration......

- Do we truly understand how hard it is for farmers to do what we are suggesting they do????
  - Weed control is but one business and management decision that farmers must make each year.
- What do we need to do to understand and address weed management within the larger context of the farming operation?
So what is next? - Questions for your consideration....... 

▶ To me --- the federal bureaucrat
▶ What do I need to know to start conversations within federal agencies?
▶ Are there federal or other government programs/policies that make it difficult to adopt BMPs?
So what is next? - Questions for your consideration.......  

- To NCWSS - the professional society
  - Do you facilitate communication between all groups within the north central region?
    - Is the message consistent and clear?
  - Do you work together across the region and with other regions?
  - What do national groups need to know about HRM in the north central?
So what is next? - Questions for your consideration....

To the research/extension community

- How will you address the fact that the HR listening session participants think there will be new MOA?
- Take Action materials have great information on MOA and other HR strategies:
  - How are they being used?
  - Do growers/advisers have the science based information they need to successfully and profitably diversify their operations?
So what is next? - Questions for your consideration......

▶ To the research/extension community
  ▶ We heard in the mid-west session that corn/soybean producers do not have profitable rotations.
    ▶ What research is going on that addresses rotations and how they fit into a complete production system?
    ▶ Do you have the economic information they need to make the changes you suggest?
  ▶ How do we address the issue of seed movement more effectively/efficiently?
So what is next? - Questions for your consideration........

- To the advisers
  - How are you using the Take Action materials?
    - Is your messaging consistent?
    - Are you remaining current?
    - Are you impartial?
  - What do you need from research/extension to provide science based information on diversification of practices to your farmers?
So what is next? - Questions for your consideration…….

- To the Industry
  - How are you using the Take Action materials?
    - Is your messaging consistent with others?
    - Are you impartial?
  - Why do farmers think a new MOA is coming?
  - How is your technology integrated with other weed management tools to reduce selection pressure on weed populations?
An invitation to join the discussion -

- NCWSS is an excellent forum to coordinate this needed discussion.
- NCWSS can facilitate discussions with
  - Members
  - Other regional societies
  - WSSA
  - Government agencies - both state and federal
An invitation to join the discussion -

- WSSA annual meeting January 28-February 1
  - Arlington, VA (Crystal Gateway Marriott)
- February 1 - symposium “Learning by Listening: Herbicide Resistance Listening Sessions”
  - Panel discussions by representative stakeholders and by regional coordinators
- PLEASE JOIN THE DISCUSSION
COMMENTS? QUESTIONS?

Thank you