Looking Forward In Agriculture

Herbicides

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Because weeds just keep getting tougher
What is the Future of Weed Control

“The farther backward you can look, the farther forward you are likely to see.”

– Winston Churchill
Where Are You Located?

A. Midwest
B. Western US
C. Delta/SW
D. SE
E. NE
F. CA
G. S. of US
H. Canada
What is Your Favorite Dessert?

A. Apple pie  
B. Chocolate cake  
C. Cheesecake  
D. Coffee  
E. Beer
Chronological Increase in Resistant Weeds Globally
A. Currently **not an issue** - probably **won’t be** in the future

B. **Is an issue** now but probably **won’t get worse**

C. **Is an issue** now and most probably **will become a very significant problem** – could become “unmanageable”

D. **Is an issue** but “industry” will come up with a solution (aka silver bullet) before it becomes unmanageable

- Currently not an issue: 70%
- Is an issue now but probably won’t get worse: 23%
- Is an issue now and will become a very significant problem: 2%
- Is an issue but “industry” will come up with a solution: 4%
Weed Populations Resistant to Multiple Sites of Action

Selection of your “H” tool by SOA is important!!
Enabling Site of Action Diversity
How Many of You Consult with Growers with Weed Resistance Levels of...

A. No resistance?
B. One site-of-action?
C. Two sites-of-action?
D. Three sites-of-action?
E. More than three sites-of-action?

<table>
<thead>
<tr>
<th>Type of Resistance</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>No resistance</td>
<td>23%</td>
</tr>
<tr>
<td>One site-of-action</td>
<td>29%</td>
</tr>
<tr>
<td>Two sites-of-action</td>
<td>31%</td>
</tr>
<tr>
<td>Three sites-of-action</td>
<td>14%</td>
</tr>
<tr>
<td>More than three sites-of-action</td>
<td>3%</td>
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Five common weed Families have a high potential for resistance
Why Are Resistant Weeds Becoming Such a Problem?

A. Changes in Tillage Practices
B. Not enough new herbicides
C. Over reliance on a few herbicides (Modes of action)
D. Weak overall weed management systems
E. All of the above
Herbicide New A.I. Patents 1982-2010
Bayer Crop Science
Bayer regained the rights to the company in the U.S. in 1994. (Bayer and Monsanto formed Mobay in 1954 to make polyurethanes. In 1977, Bayer bought out Monsanto because of anti-trust actions.)
How Many Basic Pesticide Manufactures Are Looking for Novel Crop Protection Chemicals?

A. All
B. 10
C. 9
D. 6

1. Bayer
2. BASF
3. Dow
4. DuPont
5. Syngenta
6. Valent/Sumitomo

53% 18% 18% 11%
Capacity and “interest” dropped
Growing gap is potential problem!

New Patents vs. Increase in Weed Resistance
If We Do Not Get Smarter.....
So what can we do about it?
Yield and Quality; Agronomic practices, Machinery, Resources; Agronomic practices Price and weather

WR is a relatively minor production factor allowing the farmer to “do what they have always done.

Yield and Quality; Agronomic practices, Machinery, Resources; Agronomic practices Price and weather

WR causes production problems, farmers considers WR as one of the most relevant.

Yield and Quality; Agronomic practices, Machinery, Resources; Agronomic practices Price and weather

Weed Management

WR is a real production limiting problem, farmers need holistic yr-over-yr production solutions

Yield and Quality; Agronomic practices, Machinery, Resources; Agronomic practices Price and weather

Production Mgmt

Weed Resistance and Farmers Mindset
Predisposition for new tools has a direct correlation to the intensity of WR
What Situation and Weed Control Strategy Are Your Producers Experiencing?

A. They **DO NOT** have resistance weed problems and are already proactive

B. They DO have resistant weeds and are working to manage them

C. Not a consideration until they lose control of their fields – due to weeds

D. Probably will never be an issue
Best Foundation for Sustainable Weed Control Program
Where Do Your Weed Management Programs Mostly Rely?

A. Pre-emergence applications
B. Post-emergence applications
C. 50/50

36% 21% 43%
Weed Control Innovations

Photo by Dr. Bob Scott, University of Arkansas 2009
Weed Control Innovations

Photo by Dr. Bob Scott, University of Arkansas 2010
Engenia + Residual Herbicides
Pre-emergence Efficacy

Engenia:
560 g ae/ha

Prowl H2O:
1064 g ai/ha

Outlook:
737 g ai/ha 48 DAT

Primarily: waterhemp and velvetleaf
Herbicide Stewardship Programs

- Effective and sustainable weed control
  - Site-of-Action diversity
  - Employ residuals effectively
  - Scout for weed escapes

- Proper application
  - Maximize target impact
  - Minimize/negate off target impact
Do Consultants/Growers Take Company “Stewardship Programs” Seriously?

A. Yes
B. Partially
C. No
Are you Confident You Will be Able to Manage Weeds for the Next 5-10 Years?

A. Yes

B. No

64% Yes

36% No
Weeds Will Be Manageable

- No new “silver bullets”
- Will cost more
  - Starting with a strong “pre” foundation
- Will take more effort
  eg.
  - Attention to MOAs
  - Scouting and getting rid of escapes

Consultants become (even) more important!