Field Observations from Roundup-Ready Soybeans

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Trends

- Rising soybean base acreage
- RR system increasingly popular
- Popularity due to perceived:
  - Better weed control
  - Reduced herbicide use
  - Reduced labor demand

(Chen et al. 2001)
Competing producer attitudes

- **Why worry?** My actions are not going to change the course of regional trends... *Deal with problems when and if they arise*

- **Why be risky?** I’ve seen resistance develop before and if we can *preserve this tool* we should do so.
Extension recommendations

- Why be risky?
- Clearly sound advice for the group
- What is best for the individual?
Nationwide

- Large-scale screening trial for RR resistance traits in weeds!
- Several possibilities
  - Altered phenology
  - Quantitative trait (variable damage)
  - Single-gene trait (yes or no)
Qualitative Surveys

- Recently two surveys of university extension personnel
  - C. Sprague – U of Ill (ncweeds listserver)
  - W. Curran – PSU (weednet listserver)
- More formal survey’s across WI
  - M. Fanning and E. Luschei – UW Madison
Purpose of talk

- Present some of the information from the various surveys
- Answer question:
  Do the results of our “large scale field trial” tell us if we need to act or how to act?
Confirmed cases of resistance

- **Horseweed/marestail** (*Conyza canadensis*)
- **Goosegrass** (*Eleusine indica*) Malaysia - 1997
- **Italian ryegrass** (*Lolium multiflorum*) Chile - 2001
- **Rigid ryegrass** (*Lolium rigidum*)
  - Australia (Victoria) - 1996, Australia (New South Wales) - 1997, USA (California) - 1998, South Africa - 2001

Source: C. Sprague, 2002

+ *other sources
How much of a concern is GLY resistance in your state?

Source: C. Sprague, 2002
How concerned are growers?

![Bar charts showing responses of growers and extension personnel.](chart.png)

Source: C. Sprague, 2002
Weed Escapes & Cause

- **Escapes** (hard to control: late emergence: or both)
  - Waterhemp (7% : 59% : 34%)
  - Ragweed (30% : 38% : 32%)
  - Velvetleaf (45% : 48%)
  - Lambsquarters (61% : 25%)

Source: C. Sprague, 2002
What percent market share does RR have?

- Soybeans: 50-90%
- Cotton: 50-75%
- Canola: 25-80%
- Corn: 5-30%
- Sugarbeet: Idaho – to be planted ‘03

Source: W. Curran, 2002
Have you seen any changes in weed flora...?

- See table in reports
- Summary:
  - Decrease in perennial grasses + C. thistle, Dogbane, Horsenettle, Cocklebur
  - Increase in annual grasses, Dandelion, Annual Morningglory + winter annuals + many other broadleaves

Source: W. Curran, 2002
List weeds (a) tolerant and (b) resistant to GLY

(a) Tolerant weeds
- 24 species mentioned
- Dandelion, Horseweed, Morningglories (3), Smartweeds and Wild Buckwheat common

(b) Resistant weeds
- Waterhemp (suspected MO)
- Horseweed
- Lolium
- Volunteer RR crops

Source: W. Curran, 2002
WI Distribution of some spp reported to have tolerance

- C. Lambsquarters: 96
- L. Smartweed: 90
- Dandelion: 87
- Wild Buckwheat: 84
- Horseweed: 65
- Swamp Smartweed: 28
- Field Bindweed: 18
- Penn. Smartweed: 15

19 species had > 50% frequency of occurrence

Source: Fanning and Luschei 2002

Frequency of Occurrence (0-100)
What recommendations are being given?

- **General resistance management:**
  - **Diversity:** Rotation, of crop and modes of action, GMO and non-GMO
  - **Redundancy:** MOA, types – mechanical + herbicide
  - **Equipment hygiene**
  - **Vigilant Scouting**

Sources:
W. Curran, 2002,
Does all this tell us how we should act?

- System is not bulletproof. Expect less incentive when tank mixes and multiple actions are required.
- Resistance management wisdom is clearly best for the group
- Is this an “externality” worth regulating?