

# 2007 CMDC

## *Bernards*

### **Use & Copyright**

The materials in this document were developed by and for use by University of Nebraska–Lincoln Extension in the Institute of Agriculture and Natural Resources. The materials are copyrighted by the Board of Regents of the University of Nebraska–Lincoln on behalf of the University of Nebraska–Lincoln Extension. All rights are reserved.

Copies may be printed for individual personal use; however, these materials can not be republished in print, on another Web site or used commercially without prior written permission. To seek permission to print a publication for educational use, please email us at [dpittman1@unl.edu](mailto:dpittman1@unl.edu).

### **Disclaimer**

Reference to commercial products or trade names in these publications is made with the understanding that no discrimination is intended and no endorsement by University of Nebraska-Lincoln Extension is implied.

## Glyphosate Resistance Management?



Common Sunflower



Yellow Foxtail & morningglories



ALS Resistant Waterhemp

Seed/Chemical Dealer recommends 2/3 rate of Degree herbicide. Is this good resistance management?

2007cmdc-bernards001

## Herbicide Resistance

- “the evolved capacity of a previously herbicide-susceptible weed population to withstand a herbicide and complete its life cycle when the herbicide is used at its normal rate in an agricultural situation” (Heap and Lebaron, 2001)

- Resistance vs. Tolerance

- How does resistance develop?



2007cmdc-bernards002

## Herbicide Mode of Action

- I. Lipid Synthesis Inhibition
- II. Amino Acid Synthesis Inhibition
- III. Seedling Growth Inhibition
- IV. Growth Regulators
- V. Photosynthesis Inhibition
- VI. Cell Membrane Disruption
- VII. Carotenoid Biosynthesis Inhibition



2007cmdc-bernards003

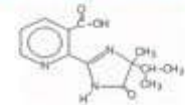
## Site of Action

- A. ALS Inhibition
- B. EPSP Synthetase
- C. Glutamine Synthetase

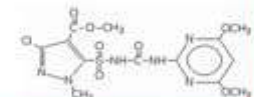


## Chemical Family

### 1. Imidazolinones

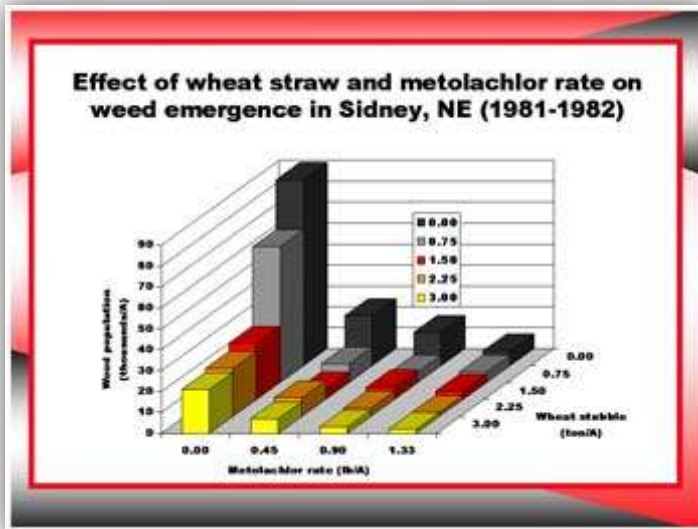


### 2. Sulfonylureas

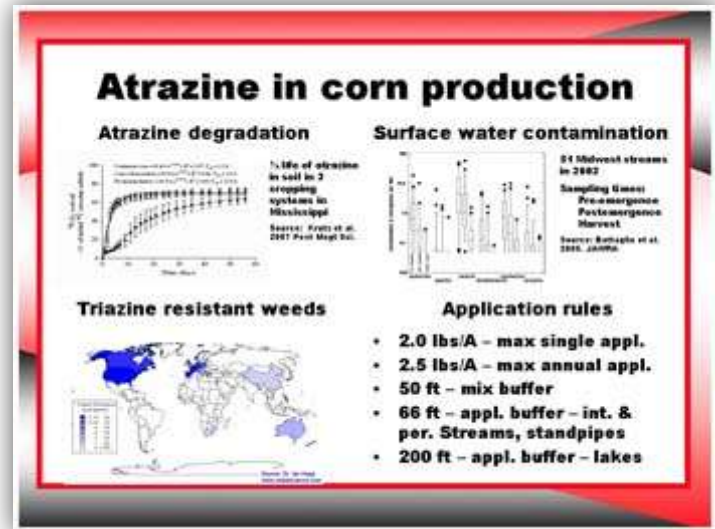


2007cmdc-bernards004





2007cmdc-bernardspest002



2007cmdc-bernardspest003