A Survey of Weed Incidence and Severity in Response to Management Practices in Missouri Soybean Production Fields

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Outline

- Hypothesis
- Materials and Methods
- Results and Discussion

Corn

Soybeans

Conclusions
Hypothesis

- Increased adoption of glyphosate and RR cropping systems has created a decline in the timeliness of herbicide applications in many soybean fields.

- Missouri soybean producers are losing yield and revenue as a result of current weed management programs.

- A shift has occurred in the spectrum of weeds encountered in Missouri soybean production systems.
Materials and Methods

2011 Survey Locations

- **Soybean – Corn Rotation** (17 sites)
- **Corn - Soybean Rotation** (16 sites)
- **Soybean-Soybean Rotation** (17 sites)

50 Total Sites
Materials and Methods

- Each location was 40 - 60 acres in size
- Locations were surveyed at two-week intervals from April - July
- Survey was conducted by counting and measuring the height of all weed species within 10, 1-m² quadrats in each field
- Weed information collected at the time of POST herbicide applications was incorporated into WeedSOFT for estimates of soybean yield loss
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Results and Discussion

Dicot Weed Species found in Surveyed Corn Fields

- Carpetweed
- Common Lambsquarters
- Common Sunflower
- Cocklebur
- Dandelion
- Eastern Black Nightshade
- Eclipta
- Field Pennycress
- Giant Ragweed
- Horsenettle
- Horseweed
- Ivyleaf Morningglory
- Mouseear Chickweed
- Pitted Morningglory
- Prickly Sida
- Shepherd’s-purse
- Smallflower Bittercress
- Soybean
- Spotted Spurge
- Tall Morningglory
- Velvetleaf
- Waterhemp
- Yellow Woodsorrel
Results and Discussion
Monocot Weed Species found in Surveyed Corn Fields

- Annual Bluegrass
- Cheat
- Fall Panicum
- Foxtail spp.
- Goosegrass
- Large Crabgrass
- Little Barley
- Poa
- Southern Crabgrass
- Yellow Nutsedge
Results and Discussion
Most Common Weed Species Encountered in Missouri Corn Fields

- Waterhemp: 47%
- Morningglory spp.: 47%
- Fall Panicum: 12%
- Foxtail spp.: 12%
- Cocklebur: 18%
- Goosegrass: 18%
- Yellow Nutsedge: 18%

% of Surveyed Fields with Weed Species
Results and Discussion

Average Weed Density at the Time of the Herbicide Treatment in Corn

- **Dicots**
  - Preplant: 12
  - PRE: 9
  - POST: 6

- **Monocots**
  - Preplant: 0
  - PRE: 3
  - POST: 1

Means followed by the same letter are not different, LSD=0.05.
Results and Discussion

Average Weed Height at the Time of the Herbicide Treatment in Corn

Means followed by the same letter are not different, LSD=0.05.
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Results and Discussion

Dicot Weed Species found in the Surveyed Soybean Fields

- Arrowleaf Sida
- Carpetweed
- Carolina Geranium
- Catchweed Bedstraw
- Chickweed
- Common Burdock
- Common Chickweed
- Common Lambsquarters
- Common Milkweed
- Common Pokeweed
- Common Purslane
- Common Ragweed
- Common Sunflower
- Cocklebur
- Curly Dock
- Cutleaf Geranium
- Daisy Fleabane
- Dandelion
- Eastern Black Nightshade
- Eclipta
- Field Pennycress
- Field Pepperweed
- Giant Ragweed
- Hairy Bittercress
- Henbit
- Horsenettle
- Horseweed
- Ivyleaf Morningglory
- Jerusalem Artichoke
- Kochia
- Mouseear Chickweed
- Nodding Spurge
- Pitted Morningglory
- Prickly Lettuce
- Prickly Sida
- Purple Deadnettle
- Shepherd’s-purse
- Smallflower Bittercress
- Soybean
- Spotted Spurge
- Swamp Milkweed
- Tall Morningglory
- Velvetleaf
- Virginia Copperleaf
- Virginia Pepperweed
- Waterhemp
- White Clover
- Wild Carrot
- Wild Mustard
- Wild Radish
- Yellow Woodsorrel
Results and Discussion
Monocot Weed Species found in the Surveyed Soybean Fields

- Annual Bluegrass
- Annual Ryegrass
- Carolina Foxtail
- Cheat
- Corn (Volunteer)
- Fall Panicum
- Foxtail spp.
- Goosegrass
- Large Crabgrass
- Little Barley
- Southern Crabgrass
- Star-of-Bethlehem
- Yellow Nutsedge
Results and Discussion

Most Common Weed Species Encountered in Missouri Soybean Fields

- Waterhemp: 87%
- Morningglory spp.: 35%
- Prickly Sida: 25%
- Velvetleaf: 16%
- Fall Panicum: 16%
- Foxtail spp.: 13%
- Cocklebur: 13%
- Horseweed: 10%
- Large Crabgrass: 10%
Results and Discussion

Average Weed Density at the Time of the Herbicide Treatment in Soybean

- **Dicots**
- **Monocots**
- **Waterhemp**

Means followed by the same letter are not different, LSD=0.05.
Results and Discussion

Average Weed Height at the Time of the Herbicide Treatment in Soybeans

Means followed by the same letter are not different, LSD=0.05.
Results and Discussion

Average Weed Density by Previous Crop in Soybean

![Graph showing weed density by crop type (Dicot, Monocot, Waterhemp) and previous crop (Corn, Soybean). The graph indicates that the density is not significantly different (P>0.17 for Dicot, P>0.14 for Monocot, and P>0.09 for Waterhemp).]
Results and Discussion

Estimated Soybean Yield Loss by 1st POST Herbicide Application

Survey Locations

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<tr>
<th>Survey Location</th>
<th>Yield Loss (Bu/A)</th>
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<td>Saline 2</td>
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Yield Loss (Bu/A)
Results and Discussion

Estimated Soybean Yield Loss by 1st POST Herbicide Application

Survey Locations

Yield Loss (Bu/A)
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**Conclusions**

- Waterhemp was the most common weed species found in soybean fields in Missouri.
- V4 is the average soybean growth stage at post treatment.
- Average yield loss in soybeans: 2.7 Bu/A.
- Producers are treating weeds that are too large:
  - Dicots: 5 ¼ inches
  - Monocots: 10 inches
  - Waterhemp: 8 ¼ inches
Conclusions

Corn vs. Soybean Weed Populations at Post Treatment

Weed Species

Dicot

Monocot

Density (#/100 ft²)
Conclusions

Corn vs. Soybean Weed Heights at Post Treatment

![Bar chart showing weed heights for Corn and Soybean in Dicot and Monocot categories.]

- **Dicot**
  - Corn: 4-5 inches
  - Soybean: 6-7 inches

- **Monocot**
  - Corn: 2-3 inches
  - Soybean: 8-9 inches

**61-81%**
Questions?