Response of Field Collected Indiana Giant Foxtail Populations to Glyphosate

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Introduction

- Glyphosate-resistant (GR) cropping systems have increased the utilization of a post-emergence glyphosate-only weed management practice. Since the first reported GR weed was found in a GR cropping system in 2001, there have been many reports of GR weed biotypes in several different plant species.
- Giant foxtail (*Setaria faberi*) can be a problematic weed in the Midwest, often causing reduction in corn yields by 28% and soybean yields by 25% (Knake and Slife 1962). Since giant foxtail is routinely found in late-season weed surveys, there is concern that it has evolved GR.

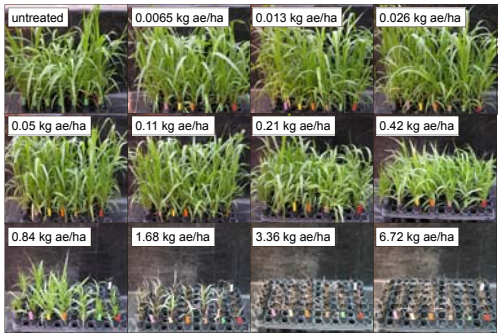
Objective

- Evaluate the response of Indiana giant foxtail populations to glyphosate

Materials and Methods

- A glyphosate dose response study was conducted on 7 Indiana populations of giant foxtail.
- Giant foxtail seeds were germinated in the greenhouse and seedlings were transplanted into individual containers.
- Plants from each population were treated with 1 of 12 herbicide rates (untreated, 0.0065, 0.013, 0.026, 0.05, 0.11, 0.21, 0.42, 0.84, 1.68, 3.36, 6.72 kg ae/ha).
- Plants were treated at ≈18 cm and were visually rated at 28 DAT.
- Data were subjected to non-linear log-logistic dose response analysis in R.

Glyphosate Treatments (21 DAT)



Literature Cited
Knake, E. L. and F. W. Slife. 1962. Competition of *Setaria faberii* with corn and soybeans. Weeds 10:26-29.

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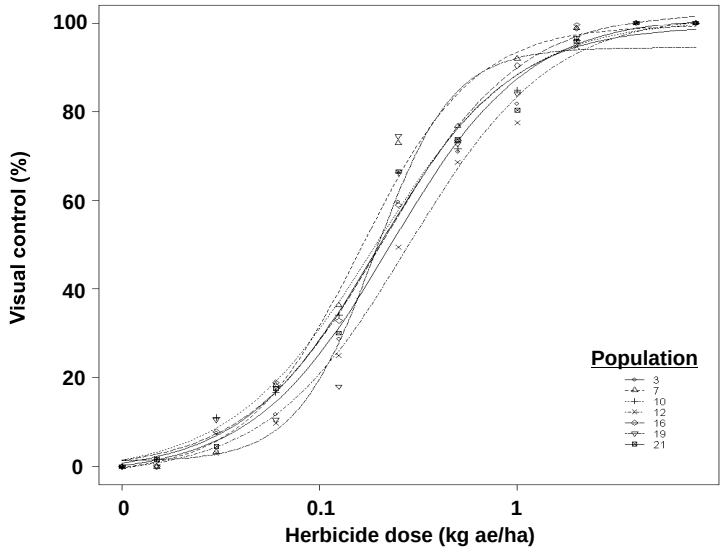
Giant Foxtail Dose Response to Glyphosate

Population	GR_{50}	R:S	GR_{90}	R:S
	— kg ae/ha —		— kg ae/ha —	
3	0.228	1.30	1.328	2.21
7	0.160	1	0.688	1
10	0.190	1.09	1.204	2.00
12	0.284	1.62	1.736	2.89
16	0.210	1.20	1.200	1.99
19	0.189	1	0.514	1
21	0.195	1.11	1.077	1.79

R:S values calculated using GR_{50} and GR_{90} averages of populations 7 and 19

Giant Foxtail Dose Response Curve



Discussion

- The standard glyphosate use rate for producers in Indiana is 0.84 kg ae/ha.
- Five of our seven populations had GR_{90} values above the 0.84 kg ae/ha rate.
- Our research indicates glyphosate-only treatments greater than 0.84 kg ae/ha may need to be used to obtain greater than 90% control of selected giant foxtail populations.