

## Influence of Corn and Soybean Herbicide Treatments on Cover Crop Stands

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One thing to consider this fall with regards to planting cover crops is how these crop species will respond to herbicide carryover. Relatively little research has been published on this topic, and the factors that affect carryover, such as moisture and soil temperature, will likely vary from year-to-year. With that in mind, we have summarized our one year of data on the effects of herbicide carryover on cover crops. This is preliminary data collected in 2013 from Columbia, MO, and the experiments are currently being repeated.

Tables 1 and 2 show stand reduction of cover crops planted in the fall following either corn or soybean, which had one of 14 different herbicide treatments. Green boxes indicate stand loss of <15% relative to the same cover crop grown on non-treated soils. Yellow boxes specify stand loss of 15 to 30% and red boxes denote stand loss of >30%. In the two experiments conducted last year, annual or Italian ryegrass (*Lolium multiflorum*) that was planted following either corn or soybean that was treated post-emergence (POST) with pyroxasulfone (Zidua) had >50% stand reduction relative to annual ryegrass grown on non-treated soils (Tables 1 and 2). Tillage radish stand reduction was greater than 30% when following corn that had a POST application of flumetsulam (Python) or following soybean that had a POST application of either imazethapyr (Pursuit), S-metolachlor + fomesafen (Prefix) or fomesafen (Flexstar) (Figure 1). Similar effects of fomesafen on tillage radish have also been observed by Dr. Mark Bernard's group at Western Illinois University in which they applied different concentrations of fomesafen (from 12.5% of the labeled rate up to the labeled rate to mimic possible carryover rates) 5 days prior to planting the tillage radish. The group observed greater than 40% damage to the tillage radish at the 1X rate of fomesafen. Bernard's group also studied wheat and cereal rye across many of the same herbicides that we tested, including: mesotrione (Callisto), pyroxasulfone (Zidua), flumioxazin (Valor), cloransulam methyl (Firstrate), fomesafen (Flexstar), sulfentrazone (Spartan), isoxaflutole (Balance Flexx), and atrazine (Aatrex). They found less than 20% visual damage at the 1X rate across all herbicides for both crops.

While this data provides some insight into cover crop selection based on previous herbicide usage, it is only preliminary.

# Influence of Soybean Herbicide Treatments on Fall Cover Crop Stand

Herbicide Treatment	Rate	Cover Crop Species							
		Tillage Wheat	Radish	Cereal Rye	Crimson Clover	Oats	Austrian Pea	Annual Ryegrass	Hairy Vetch
--product/A--		-----% Stand Reduction relative to non-treated, 28 Days after Emergence-----							
Spartan	8 fl ozs	Green	Green	Green	Green	Green	Green	Green	Green
Valor	2.5 ozs	Green	Green	Yellow	Yellow	Green	Yellow	Green	Green
Sencor	0.5 lb	Red	Green	Yellow	Green	Green	Green	Yellow	Green
Authority First	6.4 ozs	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Classic	1.5 ozs	Yellow	Yellow	Green	Green	Green	Yellow	Green	Green
Flexstar	20 fl ozs	Green	Red	Green	Yellow	Green	Green	Green	Green
Cobra	12.5 fl ozs	Green	Green	Green	Green	Yellow	Green	Green	Green
Pursuit	4 fl ozs	Yellow	Red	Green	Green	Green	Yellow	Yellow	Green
Firstrate	0.6 oz	Green	Green	Green	Green	Green	Yellow	Green	Green
Synchrony XP	0.375 oz	Green	Green	Green	Green	Yellow	Yellow	Green	Green
Dual II Magnum	1.33 pts	Yellow	Green	Yellow	Yellow	Green	Yellow	Green	Yellow
Warrant	1.5 qts	Yellow	Green	Green	Yellow	Green	Green	Yellow	Yellow
Zidua	3 ozs	Green	Green	Yellow	Green	Yellow	Green	Red	Green
Prefix	2 pts	Green	Red	Yellow	Yellow	Green	Yellow	Green	Yellow

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Table I

# Influence of Corn Herbicide Treatments on Fall Cover Crop Stand

Herbicide Treatment	Rate	Cover Crop Species							
		Tillage Wheat	Radish	Cereal Rye	Crimson Clover	Oats	Austrian Pea	Annual Ryegrass	Hairy Vetch
--product/A--		-----% Stand Reduction, relative to non-treated, 28 Days after Emergence-----							
Atrazine	2 qts	Yellow	Green	Green	Green	Green	Yellow	Green	Green
Callisto	3 fl ozs	Green	Green	Yellow	Yellow	Green	Yellow	Green	Yellow
Laudis	3 fl ozs	Green	Green	Yellow	Green	Yellow	Green	Green	Green
Impact	3/4 fl oz	Green	Green	Green	Green	Green	Yellow	Green	Green
Balance Flexx	5 fl ozs	Yellow	Green	Yellow	Green	Green	Green	Yellow	Green
Stinger	1/2 pt	Green	Yellow	Green	Red	Green	Yellow	Green	Yellow
Python	1 oz	Yellow	Red	Green	Green	Yellow	Green	Green	Green
Resolve	1 oz	Green	Green	Green	Yellow	Green	Yellow	Green	Green
Accent Q	0.9 oz	Yellow	Green	Yellow	Yellow	Green	Yellow	Green	Yellow
Surestart + Atrazine	1.75 pt + 1 qt	Green	Green	Green	Green	Green	Green	Green	Green
Halex GT + Atrazine	4 pt + 1 qt	Yellow	Yellow	Green	Green	Green	Yellow	Red	Yellow
Capreno	3 fl ozs	Green	Green	Green	Green	Yellow	Green	Green	Yellow
Zidua	3 ozs	Yellow	Green	Yellow	Yellow	Red	Green	Red	Green

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Table II

### Carryover of POST treatments to Tillage Radish



Figure 1

For more information regarding cover crops and weed science, including herbicide carryover, see our [Weed Science data slideshow \(http://weedsience.missouri.edu/extension/pdf/Bradley%20-%20cover%20crops%202014.pdf\)](http://weedsience.missouri.edu/extension/pdf/Bradley%20-%20cover%20crops%202014.pdf).

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