

Authors: Kevin Bradley, MU Extension Weed Specialist; Rich Hoomann, Charles Ellis, Kent Shannon, Bob Broz, MU Extension Specialists

Objective

To determine which corn and soybean herbicides are most likely to carryover and cause injury to cover crop species.

Methodology

Field experiments were conducted in 2013-2015 in Columbia, MO. Corn and soybean were planted in May/June. All herbicide programs tested were POST applications and applied late June - early July.

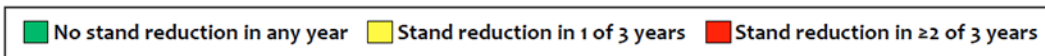
Planting Dates

For cover crops seeding dates were: September 11, 2013, September 12, 2014, and September 10, 2015.

Cover crop seed rates in lb./A

Wheat = 120; Cereal Rye = 110; Italian ryegrass = 25; Oats = 70; Crimson Clover = 30; Austrian Winter Pea = 50; Hairy Vetch = 20; Tillage Radish = 8.

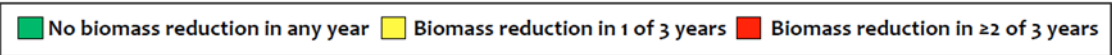
Influence of Corn Herbicide Treatments on Fall Cover Crop Stand (2013-2015)



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

©Kevin Bradley, Univ. Missouri

Influence of Corn Herbicide Treatments on Fall Cover Crop Biomass (2013-2015)



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

©Kevin Bradley, Univ. Missouri

Conclusions

Herbicide carryover injury on cover crop species is going to vary from year to year, largely due to rainfall and time of application.

The general order of sensitivity of cover crops to herbicide carryover, from greatest to least sensitive:
tillage radish > Austrian winter pea > crimson clover = annual ryegrass > winter wheat = winter oats > hairy vetch = cereal rye.

Corn herbicide treatments that were most injurious to cover crops:

- topramezone (Impact)
- mesotrione (Callisto, Halex GT, etc.)
- clopyralid (Stinger, SureStart)
- isoxaflutole (Balance Flexx)
- pyroxasulfone (Zidua, etc.)
- nicosulfuron (Accent Q, etc.)