



Residual herbicides from in-season applications may play a greater role than many producers and agronomists realize.

OVERVIEW

Adequate cover crop establishment is the first step toward a successful cover cropping practice. While herbicide carryover is well understood in cash crop production, its potential impact on late-summer and fall cover crop establishment is often overlooked. Poor establishment is commonly attributed to lack of moisture, inadequate seed-to-soil contact, or less-than-ideal planting conditions. However, **residual herbicides from in-season applications may play a greater role than many producers and agronomists realize.** This resource is intended to help evaluate herbicide programs and identify potential risks of herbicide carryover to cover crop establishment.

RISK FACTORS (NON-MANAGEMENT)

Herbicide Properties

- **Half-life:** Herbicides degrade at different rates. Understanding a product's half-life can help guide herbicide selection and application timing, particularly when cover crops are planned.
- **Water solubility:** More water-soluble herbicides may move through the soil more readily than less soluble products, potentially reducing persistence in the soil.

Weather

- Warm temperatures and adequate or above-normal precipitation generally promote herbicide degradation.
- Cool temperatures and/or drought conditions can slow degradation, increasing the risk of herbicide carryover.

Soil Properties

- **Soil pH:** Low or high pH can affect herbicide persistence and carryover risk, depending on the herbicide.
- **Organic matter (OM) and cation exchange capacity (CEC):** Higher OM and clay content generally increase CEC and can influence herbicide persistence and carryover risk.
- **Microbial activity:** Soil microorganisms play an important role in herbicide degradation. Low microbial activity can increase the risk of carryover affecting cover crops.

RISK FACTORS (MANAGEMENT)

Residual Herbicide Application Timing

- Post-emergence applications of herbicides with soil residual activity can increase carryover risk by leaving less time for degradation before cover crop establishment.
- Delayed planting or replanting can further increase risk by shifting post-emergence applications later in the season and shortening the degradation interval.

Tillage Practice

- Tillage can accelerate herbicide degradation in many situations by incorporating and distributing herbicide through the soil profile. However, some products may be reactivated following a tillage event. Producers should consult product labels and product representatives when needed.
- No-till systems tend to concentrate herbicide near the soil surface, which can increase photodegradation but limit microbial degradation. Understanding the primary degradation pathway of the herbicide active ingredients can help inform management decisions.

Cover Crop Species

- Cover crop species vary in their sensitivity to different herbicide compounds, so carryover risk can differ significantly among species.
- Residual herbicides generally have greater activity on small-seeded species, which can increase the risk of injury to small-seeded cover crops.

See page 2 for injury risk to various cover crop species.

For more information contact Torey Colburn at tcolburn@farmland.org

MANAGING HERBICIDE CARRYOVER FOR COVER CROPS

Soybean Herbicides	Generally Safe Fall Species	Species w/ Potential Injury Risk
quizalofop (Assure II)	Broadleaves	Grasses planted <120 days after application or high use rates
sulfentrazone (Authority products)	Cereals, Annual Rye	Small-seeded Legumes, Brassicas
chlorimuron (Classic)	Cereals, Annual Rye	Small-seeded Legumes, Brassicas
cloransulam (FirstRate)	Cereal Rye, Wheat, Triticale	Small-seeded Legumes, Brassicas
flumioxazin (Valor products)	Grasses	Small-seeded Legumes, Brassicas
metribuzin (Sencor)	Cereals, Annual Rye	Slight risk: Small-seeded Legumes, Brassicas
imazethapyr (Pursuit)	Cereal Rye, Wheat, Triticale, Clover	Oats, Brassicas
fomesafen (Flexstar/Prefix)	Cereals	Small-seeded Legumes, Brassicas
Corn Herbicides	Generally Safe Fall Species	Species w/ Potential Injury Risk
topramezone (Impact, Armezon)	Oats, Barley, Cereal Rye, Wheat - after 3 months	Boadleaves are most sensitive
mesotrione (Callisto, HalexGT)	Grasses	Small-seeded Legumes, Brassicas
clopyralid (Stinger, SureStart)	Grasses	Small-seeded Legumes
isoxaflutole (Balance Flexx)	Fall Cereals	Annual Rye, Legumes, Brassicas
atrazine (AAtrex, others)	Fall Cereals, Crimson Clover, Hairy Vetch	Some Brassicas, Some Small Seeded Legumes
tembotrione + thiencazone-Methyl (Capreno)	Most species generally safe	Occasional injury in Annual Rye
tembotrione (Laudis)	Most species generally safe	ocasional injury in Crimson Clover
Products Labeled for use in Both	Generally Safe Fall Species	Species w/ Potential Injury Risk
pyroxasulfone (Zidua)	All Species	No significant injury expected in most scenarios
acetochlor (Warrant)	Most Fall Species	No significant injury expected in most scenarios
dicamba (XtendiMax, Status, others)	All Species	Generally safe unless high use rates or <120 days from application
metolachlor (Dual)	Most Species	Annual Rye, Small Seeded Grasses
dimethenamid (Outlook)	Most Fall Species	No significant injury expected in most scenarios
saflufenacil (Sharpen)	All Species	No significant injury expected in most scenarios
pendimethalin (Prowl)	Cereal Grains	Small Seeded Legumes, Annual Rye