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Herbicides and Fall Cover Crop Establishment

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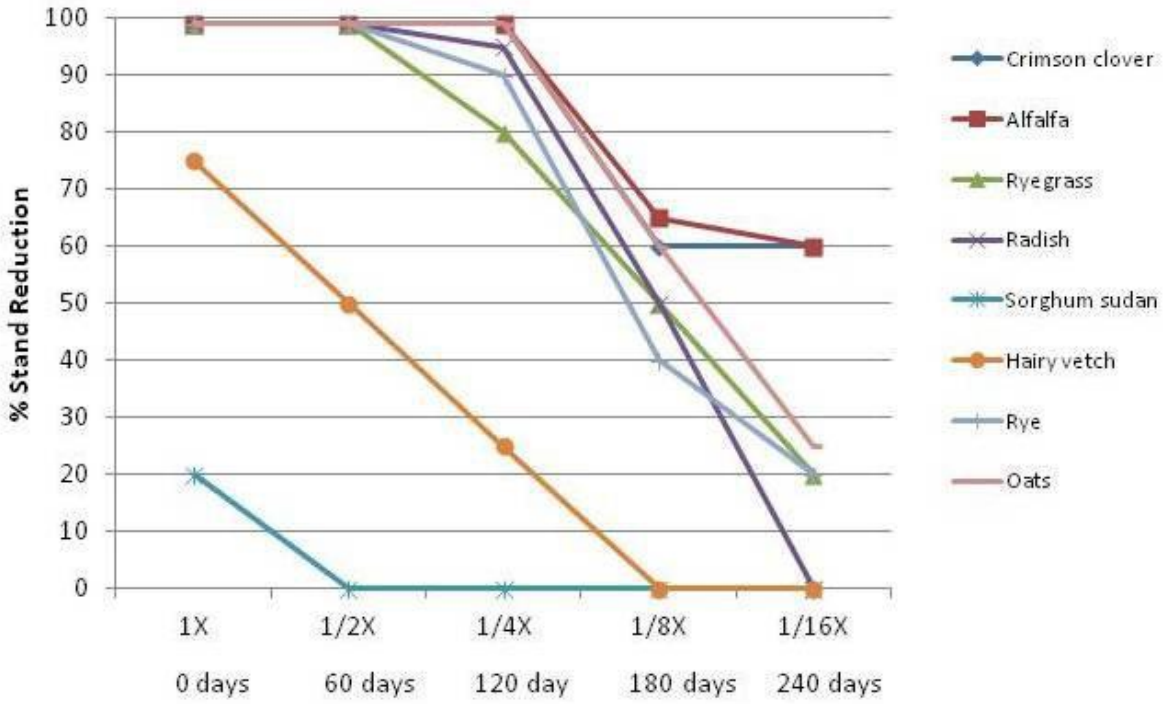
Do corn and soybean herbicides influence fall cover crop establishment?

The question about whether corn or soybean herbicide programs will pose a problem for seeding fall cover crops is again upon us, particularly in areas of severe drought where corn is harvested earlier than normal and the desire to plant a cover/forage crop is strong. If you look at the rotation crop restrictions for corn and soybean herbicides in the Agronomy Guide (Tables 2.2-17 and 2.4-15), you will see that many products limit rotation to alfalfa and/or clover as well as some of the small grains. This is a good place to start when thinking about rotation to fall cover crops. However, these tables are inadequate because these cash crop rotation restrictions may be due to the concern for herbicide residues accumulating in forage or feed rather than carryover injury. If the crop is not going to be harvested and consumed by livestock or humans, then the primary concern is carryover injury and achieving an

acceptable stand that provides the benefits of a fall or winter cover.



Percent reduction in crop stand at different herbicide rates for Atrazine. Rate titrations meant to illustrate theoretical herbicide half-life.

Although few cover crops are listed in these Agronomy Guide tables or on herbicide labels, look for close plant relatives to get an idea of how certain species may succeed. For example, there is no listing for the legume hairy vetch or the mustard daikon radish in the Agronomy Guide or on most labels, but by looking at the alfalfa or clover restrictions or at annual mustards such as canola you can "guesstimate" which herbicides may cause potential injury to related cover crop species. In general, products with a 4 month or less rotation restriction for the species of interest, close relative, or sensitive species (i.e. clovers) should pose little problem.

The primary corn products of concern for fall cover crops are **atrazine** or **simazine**, particularly for **legumes, brassicas, or annual ryegrass**. Atrazine and simazine will persist longer on higher pH soils (pH 7 or greater) or soils recently limed, so watch surface pH in particular. Table 1 provides some persistence information for some commonly used corn and soybean herbicides. Herbicides with shorter half-lives (the time it takes for 50% of the active ingredient to dissipate) are always less of a concern. In addition, species sensitivity can play a role if only a small amount of residue is necessary to cause injury.

This past summer, we did a demonstration at our Landisville research farm using a log sprayer and herbicide rate to simulate herbicide half-life. Those of you that attended our Farming for Success Field Day in June saw this demonstration. Cover crops were seeded and herbicides applied in mid-May. We rated % reduction in cover crop stand about one month after planting and spraying. The accompanying graph is for atrazine, which was applied at 1.5 lb (3 pt) per acre. The estimated half-life for atrazine is 60 days. In this demonstration, the sorghum-sudangrass was mostly unaffected (as expected). All the other cover crop stands were still reduced at the 1/4X rate (0.375 lb per acre) which would be equivalent to two half-lives or 120 days with some species still being affected at 1/16X (0.094 lb acre) which would in theory be equivalent to 240 days or 8 months after application. The alfalfa and crimson clover were particularly sensitive to atrazine with a 60% reduction in stand even at the lowest rate. We must emphasize that this was only a demonstration, not research. However, it did do a nice job showing how different crop species differ in susceptibility to different herbicides. Look at what herbicide programs you are using and the potential for carryover injury to fall cover crops before seeding something this fall.

Table 1. Typical herbicide rates, sensitive species, half- life, and potential for carryover injury to sensitive crops (carryover potential based on half lives and soil availability). Herbicide half-life estimates derived from the WSSA Herbicide Handbook, 2007 or other scientific literature.

Herbicide	Typical rate/acre	Sensitive species	Half life (days)	Carryover potential
Accent	2/3 oz	Broadleaf's +grass	21	Low
Assure/Targa	8 oz	grass	60	Low
Atrazine	1 lb	Broadleaf's +grass	60	Moderate
Authority	4 oz	Broadleaf's	32-302	Moderate
Balance Pro	2 fl oz	Broadleaf's +grass	50-120	Moderate
Callisto	6 fl oz	Broadleaf's	5-32	Moderate
Classic	2 oz	Broadleaf's	40	Moderate
Dual II Mag	1.67 pt	Broadleaf's +grass	15-50	Low
FirstRate	0.33 oz	Broadleaf's	8-33	Low
Harmony	1/8 oz	Broadleaf's	12	Low
Harness	2 pt	Broadleaf's +grass	10-20	Low
Impact	0.75 fl oz	Broadleaf's +grass	14	Low

Laudis	3 fl oz	Broadleaf's +grass	14	Low
Outlook	16 fl oz	Broadleaf's +grass	20	Low
Peak	1 oz	Broadleaf's	9-152	Moderate
Permit	2/3 oz	Broadleaf's	9-27	Low
Prowl H2O	3 pt	Broadleaf's +grass	44	Low
Pursuit	4 fl oz	Broadleaf's +grass	60-90	Moderate
Raptor	5 fl oz	Broadleaf's +grass	20-30	Low
Reflex	1.5 pt	Broadleaf's	100	Moderate
Resolve	2 oz	Broadleaf's +grass	2-4	Low
Select	10 oz	grass	3	None
Sencor	0.33 lb	Broadleaf's +grass	14-60	Low
Sharpen	3 fl oz	Broadleaf's	7-35	Low
Simazine	1 lb	Broadleaf's +grass	60	Moderate
Stinger	5 oz	Broadleaf's	40	Moderate
Valor	2.5 oz	Broadleaf's	12-20	Low

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