COVER CROP TERMINATION CONSIDERATIONS

Besides mode of action, there are a few factors to consider when selecting the correct burndown herbicide – like resistance and potential carryover. Below are some factors with key burndown herbicides to keep in mind as the timing window for applications this spring is right around the corner.

- **Weather is probably the biggest consideration.** Almost all herbicides work best when plants are actively growing (especially herbicides that are translocated). Cool and cloudy conditions often delay herbicide activity, and dry weather can increase carryover potential.
- **Glyphosate (Group 9) is a common burndown option.** Glyphosate kills plants by barring the synthesis of amino acids (which can take up to a couple weeks to completely kill the plant). This chemistry needs to get to the growing point of the plant to be active. Thus, anything that prevents glyphosate from translocating within the plant will reduce its effectiveness:
    1. Cold and cloudy weather
    2. Premixes with glyphosate that kill plants quickly (like paraquat, for example)
- **Paraquat (Group 22) is another possibility.** Paraquat terminates plants by triggering free radicals in the plant to build up and break up plant membranes. This happens quickly, usually within a couple days. Paraquat does have some translocating properties, but plant death usually happens before that occurs. Because paraquat is a contact killer, good coverage is needed to get control. Broadleaf control is more assured than with grasses, where a second application may be needed due to regrowth. Paraquat has zero soil activity, so carryover concerns aren't a problem.
- **Glufosinate (Group 10) kills plants by disrupting ammonia recycling** - which causes photosynthesis and other processes in the growing plant to stop. Like glyphosate, control of plants using glufosinate is greatly affected by weather – plants need to be actively growing to achieve adequate results. Good coverage is needed as this is a contact herbicide as well.
- **Group 4 herbicides (auxenics) have a place in cover crop burndown applications.** 2,4-D, dicamba, and clopyralid all fall into this category of herbicides that work primarily on legumes and other broadleaves. Auxenic herbicides kill plants by disrupting metabolic processes within the plant, usually taking at least a week for plants plant to die. Resistance to auxenics in waterhemp and other weeds have occurred – and we know that several mustard species aren't easily controlled with these products. We typically don't see any carryover issues with auxenics, although 2,4-D can cause some problems, depending on organic matter and soil pH.
- **Group 5 herbicides (triazine family, metribuzin, others) work for burndown applications by stopping the photosynthesis process in the plant.** These herbicides translocate differently than glyphosate in the plant, which means post applications are not as effective. Dry weather can reduce their effectiveness too. Several weeds have selected resistance to triazine herbicides (like pigweeds, lambsquarters, velvetleaf, etc.). Because of their residual activity, consideration for the following cash crop (and cover crop) is important.

- **PPO Inhibitors (Group 14) like Sharpen and Reflex stop biosynthesis of chlorophyll and other pigments in the plant.** PPOs typically work better on broadleaves than grasses, and affected plants usually die within a week. Resistance to PPOs has been witnessed across the country (waterhemp and palmer amaranth), and carryover concerns are valid with PPOs, especially on fall cover crops.
- **ACCase Inhibitors (Group 1) herbicides are used on grasses in post applications,** and typically take about 2 weeks for plants to completely die. Examples of these herbicides are sethoxydim, clethodim and quizalofop. Like other herbicide families, ACCase inhibitors work best on actively growing plants. In dry conditions, expect these herbicides to have a reduced effect. Using Group 1's alongside 2,4-D and other auxenic herbicides have caused reduced efficacy. Some resistance has been seen in annual ryegrass to ACCase products so caution must be taken.
- **Many other options exist to control cover crops in the spring.** Use caution and plan ahead for your best chance at success.

COVER CROP TERMINATION OPTIONS

		Winter kill	Rolling / Crimping	Mowing	Tillage	Herbicide	Cover Crop Growth Stage	Herbicides for Termination
Brassicas	Radish / Turnips	*	No	No	Yes	Yes		Glyphosate / Paraquat
	Canola / Rapeseed							
	Mustard							
Legumes	Crimson Clover	*	No	No	*	Yes		Glyphosate; 2,4-D + Dicamba
	Winter Pea	*	No	Yes	*	Yes		Glyphosate + 2,4-D; Paraquat + 2,4-D
	Hairy Vetch	No	Yes (Full Bloom)	No	Yes, but 2 passes may be needed	Yes	Yes (Pre or Mid- Bloom)	Glyphosate + 2,4-D or Dicamba; Paraquat + 2,4-D
Grasses	Annual Ryegrass	*	No	No		Yes	< 6 - 8"	Refer to Management Guide
	Winter Barley	No	Yes, at milk or dough stage	Yes		Yes	Prior to Boot Stage (<18")	Glyphosate 4.5 lb ae per gal; 22 fl. oz per acre
	Winter Triticale							
	Winter Wheat							
	Cereal Rye							

*Varies based upon region and climate

Taken from University of Wisconsin & Penn State University

This chart is derived from the University of Wisconsin and Penn State University, with a few additional options our group has added based on experience in the field. If questions, contact us at 800.356.7333 or info@laxseed.com. We have additional resources to help you make the best decisions this spring.

References: Shaner, University of Colorado; Hartzler, Iowa State University; Johnson, Purdue University; Davis, University of Wisconsin; Curran, Penn State University.

About The Dirt

The Dirt is a periodic email series with timely cover crop tips from the agronomic experts at Soil First and La Crosse Seed. If you have a question you'd like us to answer, contact us: info@laxseed.com or 800.356.7333