

# Make Sure You Burndown Cover Crops Effectively

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For those growers who may have planted cover crops last fall, it will be very important to apply an effective burndown to these species in the coming weeks. Cover crops that aren't effectively controlled prior to planting this spring can become a weed that takes moisture and nutrients away from the developing corn or soybean plants. Tables 1-3 show some of our recent research results related to the effects of some common herbicide burndown programs on the control of different cover crop species.

Tables 1 and 2 show the response of wheat, cereal rye, annual ryegrass, crimson clover, hairy vetch, and winter pea to a variety of herbicide burndown treatments. Table 1 shows the control provided by these treatments when applied earlier in the spring on April 5th, while Table 2 shows the control provided by these same treatments applied later in the spring, on May 1st. As you can see from the results presented in both tables, it is very important to make a timely and effective burndown herbicide application, regardless of which cover crop species you have present. Also, it seems clear from our results that the effectiveness of these different herbicide treatments will vary by cover crop species, but overall some of the species that have proven the most difficult to control in our research are annual ryegrass, wheat, and crimson clover. On the other hand, some of the cover crop species that these burndown treatments have controlled fairly well include cereal rye, hairy vetch, and winter pea. It is also important to note that tillage radish and oats winter-killed in our experiments, although they were a part of the study initially. In our experiences so far in central Missouri, neither of these species will over-winter.

Due to the troublesome and persistent nature of annual ryegrass, we also conducted a separate experiment to evaluate more treatments and timings for the control of this species. The results from this experiment are shown in Table 3. Once again, one of the most important take-home messages from this experiment is that the timing of the burndown herbicide application is critical to the level of annual ryegrass control achieved. For example, in this experiment the average level of annual ryegrass biomass reduction with the glyphosate-containing treatments evaluated was 91% when applications were made to 5 ¾-inch annual ryegrass, but declined to 77 and 58% when these same herbicide treatments were applied to 14- and 36-inch annual ryegrass, respectively.

There are two other things to keep in mind when it comes to the results of this study. First, our base rate of Roundup PowerMax that we used in all of these treatments was 36 ounces per acre. Based on the results from last year's study it seems clear that this rate may need to be even higher for ryegrass. Second, we weren't able to include tank-mixes mixes of glyphosate plus certain grass herbicides like clethodim (SelectMax, Arrow, etc.) in the trial last year but there is some data coming out of the southern United States that shows these mixes are effective. For example, several weed science colleagues in the southern states where ryegrass problems are more severe have seen good results with glyphosate plus Select Max at 10 to 16 ounces per acre.

Because ryegrass can be especially difficult to control in the spring, consider the following tips to achieve a more effective burndown of this species: 1) make sure to adjust spray settings (higher GPA, nozzle selection, etc.) to optimize spray coverage, 2) spray during daylight hours when annual ryegrass is actively growing, preferably at temperatures around 60 F, 3) spray at least 4 hours prior to sunset to allow for maximum herbicide translocation, and 4) try to avoid spraying when day or night time temperatures are forecasted in the 30's for an extended period of time.

**Table 1. Influence of early spring (April 5th) herbicide treatments on the control of various cover crop species (Columbia, Missouri 2013)**

Herbicide Treatment	Rate	Wheat	Cereal Rye	Annual Ryegrass	Crimson Clover	Hairy Vetch	Cereal Rye/Vetch	Winter Pea	*Avg. Control
	product/A	% Control 21 Days After Treatment							
Roundup PowerMax	28 fl ozs	83	98	93	22	20	100	72	70
Roundup PowerMax + 2,4-D	28 fl ozs + 1 pt	65	95	93	33	100	98	78	80
Roundup PowerMax + Clarity	28 fl ozs + 16 fl oz	62	95	88	28	98	98	97	81

Roundup PowerMax + Sharpen	28 fl ozs + 1 fl oz	78	97	92	87	15	95	80	78
Roundup PowerMax + Aatrex	28 fl ozs + 1 qt	32	68	78	38	18	78	70	55
Roundup PowerMax + Canopy	28 fl ozs + 4 ozs	37	63	73	35	15	65	45	48
Gramoxone Inteon	4 pts	30	57	28	22	20	58	33	35
Gramoxone Inteon + 2,4-D	4 pts + 1 pt	32	57	32	30	95	65	83	56
Gramoxone + Aatrex	4 pts + 1 qt	40	70	78	80	18	75	38	57
LSD0.05:	----- 15 -----								

**Table 2. Influence of late spring (May 1st) herbicide treatments on the control of various cover crop species (Columbia, Missouri 2013)**

Herbicide Treatment	Rate	Wheat	Cereal Rye	Annual Ryegrass	Crimson Clover	Hairy Vetch	Cereal Rye/Vetch	Winter Pea	*Avg. Control
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	product/A	% Control 21 Days After Treatment							
Roundup PowerMax	28 fl ozs	37	93	65	57	97	90	85	75
Roundup PowerMax + 2,4-D	28 fl ozs + 1 pt	30	92	77	58	100	93	85	76
Roundup PowerMax + Clarity	28 fl ozs + 16 fl oz	32	82	67	43	97	82	90	70
Roundup PowerMax + Sharpen	28 fl ozs + 1 fl oz	27	90	75	90	100	78	100	80
Roundup PowerMax + Aatrex	28 fl ozs + 1 qt	30	33	32	32	98	30	87	49
Roundup PowerMax + Canopy	28 fl ozs + 4 ozs	18	30	22	28	92	23	83	42
Gramoxone Inteon	4 pts	92	97	95	100	100	100	98	97
Gramoxone Inteon + 2,4-D	4 pts + 1 pt	92	100	95	95	100	98	100	97

Gramoxone + Aatrex	4 pts + 1 qt	95	100	95	82	99	100	100	96
LSD0.05:		----- 11 -----							

**Table 3. Influence of herbicide treatments and application timings on the control of an annual ryegrass cover crop (Columbia, Missouri 2013).**

		Application Timing and Ryegrass Stage		
Herbicide Treatment	Rate	Early (April 2) 5.75"; Tillering	Mid (April 22) 14"; Pre- boot	Late (May 16) 36"; Boot
	product/A	% Biomass Reduction 28 Days After Treatment		
Roundup PowerMax	36 fl ozs	93	80	63
Roundup PowerMax + 2,4-D	36 fl ozs + 1 pt	92	75	57
Roundup PowerMax + Clarity	36 fl ozs + 1 pt	87	65	64
Roundup PowerMax + Sharpen	36 fl ozs + 1 fl oz	90	76	54

Roundup PowerMax + Aatrex	36 fl ozs + 1 qt	91	81	55
Roundup PowerMax + Canopy	36 fl ozs + 4 ozs	88	79	47
Roundup PowerMax + Basis Blend	36 fl ozs + 1.25 ozs	83	78	56
Roundup PowerMax	72 fl ozs	90	78	65
Gramoxone Inteon	4 pts	78	77	44
Gramoxone Inteon + 2,4-D	4 pts + 1 pt	90	77	52
Gramoxone Inteon + Aatrex	4 pts + 1 qt	87	82	54
Gramoxone Inteon + Lorox	4 pts + 24 ozs	89	83	50
Gramoxone Inteon + Sencor + 2,4-D	4 pts + 4 ozs + 1 pt	90	87	60
Liberty	29 fl ozs	35	50	34

Liberty + Atrazine	29 fl ozs + 1 qt	71	50	45
LSD0.05 (treatments x timings):		----- 15 -----		

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