Using multiple herbicide mode of actions in Roundup Ready spring canola for avoiding glyphosate resistance in Italian ryegrass

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Reporting Period: 2022

Methods: The 2022 trial followed our current proposal with the exception that we applied Liberty both early (3-4 leaves) and late (6 leaves–bolting) because of additional Italian ryegrass flushes brought on by the wet spring. Canola was seeded on 4-29-22 and harvested on 9-2-22.

Results/Accomplishments: The greatest Italian ryegrass control resulted from applications of PowerMax with control at or near 100% at harvest (Table 1). Applications of PowerMax were so effective in controlling Italian ryegrass that it was difficult to see added control from Treflan in the multiple-mode treatments. Treflan by itself averaged 83% control and was not different from Treflan followed by Liberty in the crop, or early plus late postemergence applications of Liberty. Kerb, at the rate used in this study, was moderately active on Italian ryegrass early but not effective by harvest. The early PowerMax application of 44 oz/A resulted in the highest canola yield of 2590 lb/A. All late postemergence PowerMax applications reduced yield and delayed flowering, even with 100% Italian ryegrass control by harvest. Italian ryegrass competition in the nontreated check treatment reduced crop yield to 1500 lb/A, over 1000 lb/A less than the highest yielding treatment. Treflan plus Liberty is a possible non-glyphosate multiple-mode option for Italian ryegrass control. It appears that glyphosate poses a potential yield drag to the canola cultivar used in this trial. It is not known if other Roundup Ready canola cultivars experience this yield drag. For 2023, we will replace Kerb with Sonalan.

Table 1. 2022 Italian ryegrass control in spring canola.

	Canola	Italian ryegrass
Herbicides[1]	Yield lb/A[2]	% control[2] at harvest
PowerMax 44 oz/A EPOST	2590 a	100 a
Treflan 24 oz/A PPI + PowerMax 44 oz/A EPOST	2160 ab	97 a
Treflan 24 oz/A PPI	2020 abc	83 b
PowerMax 22 oz/A LPOST	1540 cd	100 a
Treflan 24 oz/A PPI + PowerMax 22 oz/A LPOST	1400 d	100 a
PowerMax 22 oz/A EPOST + LPOST	1730 bcd	100 a
Treflan oz/A PPI + PowerMax 22 oz/A EPOST + LPOST	1910 bcd	100 a
Liberty 22 oz/A EPOST + LPOST	1930 bcd	73 bc
Kerb 20 oz/A PRE + Liberty 22 oz/A EPOST	1870 bcd	49 cd
Treflan 24 oz/A PPI + Liberty 22 oz/A EPOST	1810 bcd	79 b
Kerb 22 oz/A Pre	1960 bc	24 d
Nontreated check	1500 cd	--

[1]EPOST=early postemergence; LPOST=late post; PPI =preplant incorporated; PRE=preemergence
[2]Numbers followed by the same letter are not statistically different ($p \leq 0.05$).

Publications: No publications were written. We are awaiting results from 2023.

Name	Supporting Agency	Total $ Amount	Effective and Expiration Dates	% of Time Committed	Title of Project
Lyon and Wetzel	Current: Washington State University	$7,536 for 2022/$22,368 for three years	6/1/2021-5/31/2023	3%	Assessing the Risk of Kerb Herbicide Carryover to Winter Wheat Following Use in Spring Canola
Lyon and Thorne	Washington State University	$10,306 for 2022/ $20,993 for two years	6/1/2022-5/31/2023	5%	Using multiple herbicide mode of actions in Roundup Ready spring canola for avoiding glyphosate resistance in Italian ryegrass
	Pending:				