

Preharvest Chickpea and Weed Desiccation

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In the fall of 2020, a chickpea herbicide trial was conducted to evaluate alternatives to glyphosate for preharvest desiccation. Glyphosate use continues to lose favor among chickpea processors. The objective was to compare RT3 (glyphosate) to alternative contact herbicides Gramoxone, Liberty, Reviton, and Sharpen.

The study was established at the Palouse Conservation Field Station near Pullman, WA. Treatments were applied when the chickpea were ~50% naturally desiccated and weeds were green but active growth was reduced. Treatments were applied with a CO₂ powered backpack sprayer and a 5 ft boom with 4 Teejet 11002VS nozzles with an effective spray pattern of 6 ft and calibrated to deliver 15 gallons per acre (GPA). The study was conducted in a randomized complete block design with 4 replications. Plots were 8 ft by 25 ft long. Treatments were assessed for desiccation, regrowth, and yield. Data were subject to ANOVA using the Agricultural Research Manager software (Ver. 8.5).

Table 1. Treatment application details

Study Application	
Date	September 1, 2020
Application volume (GPA)	15
Timing	Pre-harvest
Crop Stage	~50% Desiccated
Air temperature (°F)	81
Soil temperature (°F)	63
Wind velocity (mph, direction)	3.7, N
Cloud Cover	30

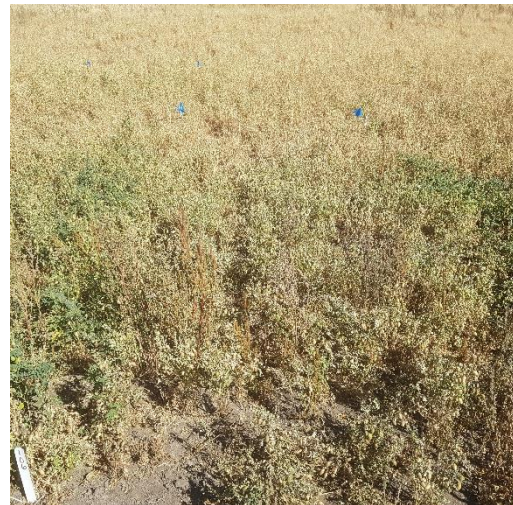


Figure 1. Chickpea had a noticeable off white appearance one week after treatment with Liberty plus Sharpen applied at 25 GPA.

Results

Desiccation of chickpea was variable, and similar among treatments. The numerically greatest desiccation occurred when chickpea were treated with RT3 at 15 GPA, or Liberty plus Sharpen at 25 GPA, or Liberty plus tiafenacil at 25 GPA. Overall regrowth was limited, not greater than 13%, and less than the nontreated. Yield on the site was variable and similar among treatments.

Recent research has indicated that PROTOX inhibitors like Sharpen and Reviton (a new herbicide from Helm containing the active ingredient tiafenacil, a very similar herbicide to Sharpen or saflufenacil) synergize with Liberty at very low doses. In this experiment, Reviton applied alone resulted in numerically less desiccation. When Reviton was applied in mixture with Liberty at 25 GPA, the mixture resulted in numerically similar desiccation to RT3, and was similar to Liberty plus Sharpen. It's not likely that the preharvest applications of herbicides affected yield.

Desiccation was numerically less when applied at 15 GPA, indicating that coverage is critical for desiccation with contact herbicides used in this study. Reviton appears to be similar to Sharpen when applied in mixture with Liberty. The mixtures of Liberty and Sharpen or Reviton appear to be alternative treatments to glyphosate for chickpea desiccation.

Table 1. Chickpea desiccation, regrowth, and yield in response to herbicide treatment applied preharvest, at the Palouse Conservation Field Station, Pullman, WA, in 2020.

Treatment	Carrier Volume			Desiccation	Regrowth	Yield
		Rate		Sept 23, 2020	Sept 23, 2020	Sept 23, 2020
		GPA		%	%	%
Nontreated				0 b	52 a	1700 a
Roundup-RT3	15	0.77	lb ai/a	95 a	7 b	1685 a
NIS		0.25	% v/v			
Reviton	15	0.0332	lb ai/a	82 a	5 b	1555 a
MSO		0.5	% v/v			
Gramoxone SL 2.0	15	0.5	lb ai/a	80 a	12 b	2135 a
MSO		0.5	% v/v			
Liberty		0.53	lb ai/a			
Sharpen	15	0.0044	lb ai/a	83 a	12 b	1970 a
MSO		1	% v/v			
Liberty		0.53	lb ai/a			
Reviton	25	0.0332	lb ai/a	90 a	7 b	2000 a
MSO		1	% v/v			
Reviton	25	0.0332	lb ai/a	73 a	13 b	1870 a
MSO		0.5	% v/v			
Gramoxone SL 2.0	25	0.5	lb ai/a	90 a	12 b	2000 a
MSO		0.5	% v/v			
Liberty		0.53	lb ai/a			
Sharpen	25	0.0044	lb ai/a	98 a	3 b	1520 a
MSO		1	% v/v			
Liberty		0.53	lb ai/a			
Reviton	25	0.0332	lb ai/a	98 a	0 b	1910 a
MSO		1	% v/v			

Disclaimer

Some of the pesticides discussed in this presentation were tested under an experimental use permit granted by WSDA. Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to \$7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance.