Weed Control and Crop Tolerance to Paraquat Applied At-Cracking to Chickpeas

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The objective of the study was to evaluate chickpea crop tolerance to paraquat in a field setting with the addition of a nonionic surfactant and weed efficacy by paraquat. This study was a repeat of previous studies conducted in 2016 and 2017.

The 2018 study was established at the Palouse Conservation Farm near Pullman, WA. Treatments were applied post emergence (POST) at several different timings starting at chickpea cracking, detailed in Table 1 and 2. Each study was conducted in a randomized complete block with 4 replications with 10' by 30' long plots. Studies were planted with chickpea variety 'Billy Bean' on May 2, 2018. Outlook at 21 fl oz A^{-1} and Lorox at 1.5 lb A^{-1} was applied preemergence (PRE) at planting. The entire study was blanket sprayed with RT3 (48 fl oz A^{-1}), NIS (0.25% v/v), and AMS Max (17 lb/100 gal) prior to harvest for burndown.

Crop injury was visually rated 9, 17, 28, and 37 days after crop emergence (DAE). Crop cover was assessed 28 and 37 DAE. Weed control of common lambsquarters was visually assessed 37 DAE. Crop heights were recorded 28 DAE by measuring 3 chickpea plants per plot. Plots were harvested using a plot combine on September 7, 2018. All data were subjected to an analysis of variance using the statistical package built into the Agricultural Research Manager software system (ARM 8.5.0, Gylling Data Management).

Visual crop injury was present after every treatment timing, however, the chickpea plants grow out of it and no crop injury was present 37 DAE (Table 2). At 28 DAE, there was no difference in crop cover. At 37 DAE, there was a reduction in crop cover for application timing B of 89 and 83% compared to 100% for the nontreated. Application B also had the most crop injury 9 DAE (41 & 49%) compared to the other timings, possibly a result of the high cloud cover (80%) at paraquat application (Table 2).

Treatment timing had no effect on plant heights or yield compared to the nontreated control. Although not significant, all treatments had numerically greater yields then the nontreated (Table 2).

Study Application	A	В	C	D
Date	May 15, 2018	May 21, 2018	May 22, 2018	May 24, 2018
Timing	At-Cracking	6 DAC	7 DAC	9 DAC
Application volume (GPA)	15	15	15	15
Air temperature (°F)	66	65	69	71
Soil temperature (°F)	16	16.5	15	18
Wind velocity (mph, direction)	4, SW	5, NW	5, SE	6, SW
Cloud Cover (%)	73	80	0	50

Table 1. Study treatment application details

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.

surfactant at different application timings in chickpea. Pullman, WA, 2018. DAE = days after crop emergence. Means followed by the same letter are not statistically significantly different (α =0.05). Table 2. Percent crop injury, crop cover, plant heights, weed control and yield following applications of paraquat with and without a nonionic

Crop Injury Crop Injury Crop Injury Crop Injury Plant Ht. Plant Ht. Prop Injury Crop Injury Plant Ht. Prop Injury Plant Ht. Prop Injury Plant Ht. Prop Injury Plant Ht. Prop Prop Prop Prop Prop Prop Prop Prop				May 24, 2018 (9 D.4E)	24, 2018 June 1, 2018 DAE) (17 DAE)		June 12, 2018 (28 DAE)		Jun	June 21, 2018 (37 DAE)	July 10, 2018 (56 DAE)	September 20, 2016
% % cm %	Rate Cro		ű	op Injury	Crop Injury	Cover	Crop Injury	Plant Ht.	Cover	Crop Injury	Weed Control	Yield
2d 100 0c 25 100a 0 96 3d 100 0c 27 100a 0 96 14b 100 0c 27 100a 0 99 16b 97 8abc 22 83b 0 96 6cd 100 0c 26 100a 96 9c 100 5bc 24 96ab 0 96 28a 100 14a 23 89b 0 100 28a 100 9ab 23 97ab 0 100 1d 99 0c 26 99a 0 91 1d 99 0c 26 99a 0 95 1d 98 0c 27 100a 95 429 NS 4.88 NS 9.97 NS NS	field rate Bai/A	- ∯, ai/A		%	%	%	%	cm	%	%	9%	Ib/A
2d 100 0c 25 100a 0 96 3d 100 0c 27 100a 0 100 14b 100 8 abc 22 89 b 0 99 16b 97 8 abc 22 83 b 0 96 6 cd 100 0c 26 100a 96 9c 100 5bc 24 96 ab 0 96 28a 100 14a 23 89 b 0 100 28a 100 9ab 23 97 ab 0 98 1d 99 0c 26 99 a 0 91 1d 99 0c 26 99 a 0 95 1d 98 0c 27 100a 95 429 NS 4.88 NS 9.97 NS NS					,		,	28		,	•	1860
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14b 100 8 abc 22 89 b 0 99 16b 97 8 abc 22 83 b 0 96 6 cd 100 0 c 26 100 a 96 9c 100 5 bc 24 96 ab 0 96 28 a 100 14 a 23 89 b 0 100 28 a 100 9 ab 23 97 ab 0 100 1d 99 0 c 26 99 a 0 91 1d 10 0 c 27 100 a 0 95 1d 98 0 c 26 95 ab 0 95 4.29 NS 4.88 NS 9.97 NS NS	8 floz/A 0.125 0.25 % v/v			\$	3 d	100	00	27	100 a	0	100	1990
16 b 97 8 abs. 22 83 b 0 96 6 cd 100 0 c 26 100 a 96 96 9 c 100 5 bc 24 96 ab 0 96 28 a 100 14 a 23 89 b 0 100 28 a 100 9 ab 23 97 ab 0 100 1 d 99 0 c 26 99 a 0 91 1 d 100 0 c 27 100 a 95 1 d 98 0 c 26 95 ab 0 98 4.29 NS 4.88 NS 9.97 NS NS	8 £0z/A 0.125 4		4	41 b	14 b	100	S also	22	89 P	0	66	2270
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	LSD 2		2	. 92	4.29	NS	4.88	NS	26.6	NS	NS	NS