

# Common Lambquarters Control with Pyridate in Chickpeas

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Study objective was to evaluate crop tolerance and weed efficiency of pyridate applied postemergence in chickpeas just prior to bloom. There are currently no registered postemergence broadleaf herbicides available for use in chickpeas. Broadleaf weed control is dependent on preemergence herbicides, which relies highly on adequate and timely rainfall.

The study was established at the Palouse Conservation Farm Station (PCFS) near Pullman, WA. Treatments of pyridate (Tough®) alone and in combination with clethodim (grass weed herbicide) were applied to chickpeas just prior to bloom in the spring of 2019, detailed in Table 1 and Table 2. Treatments were applied with a CO<sub>2</sub> powered backpack sprayer and a 5 ft boom with 4 Teejet 11002VS nozzles, calibrated to deliver 15 gallons per acre (GPA). Chickpea were seeded on May 3, 2019 through a Horsch drill by the PCFS farm crew into wheat residue. The site was blanket sprayed with Outlook® (21 fl oz A<sup>-1</sup>) and Spartan® (4.5 fl oz A<sup>-1</sup>) preemergence (PRE). Chickpeas emerged May 13, 2019. The study was conducted in a randomized complete block design with 4 replications of 10 ft by 30 ft long plots. A preharvest burndown of glyphosate (RT3; 32 fl oz A<sup>-1</sup>), NIS (0.25% v/v), and AMS (8 lb/100 gal) was applied two weeks prior to harvest.

Crop necrosis and epinasty was visually rated 2 DAT. Common lambsquarters (CHEAL) control and chickpea dry down was visually assessed 59 DAT. Plots were harvested using a 5 ft wide Kincaid plot combine on September 5, 2019. All data was 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).

*Table 1. Treatment application details*

Study Application	Application
Date	June 16, 2019
Crop Stage	Prior to Bloom
Air temperature (°F)	75
Soil temperature (°F)	66
Wind velocity (mph, direction)	2, E
Cloud Cover	15

## Results

At 2 DAT, there was some crop necrosis (4%) present for the second highest rate of pyridate (18 fl oz A<sup>-1</sup>) with almost no crop necrosis (1 to 0%) for all other treatments (Table 2). Crop epinasty at 2 DAT was present for the pyridate (12 fl oz A<sup>-1</sup>) + MCPA ester (4.32 fl oz A<sup>-1</sup>) + NIS (50%) compared none for all other treatments.

All treatments controlled common lambsquarters compared to the PRE only treatment of Outlook + Spartan 59 DAT. Pyridate applied with NIS at a rate of either 12, 18, or 24 fl oz A<sup>-1</sup>, had 93, 87, and 94% common lambsquarters control, respectively. Pyridate (12 fl oz A<sup>-1</sup>) with COC had 92% control (Table 2).

Crop drydown was similar for all treatments except Pyridate + MCPA ester. Pyridate with MCPA ester had only 20% crop dry down at 59 DAT due to the crop injury which caused the chickpea crop to be set back. All other treatments had an average of 76% dry down (Table 2).

There were no significant differences in yield for any treatment. However, pyridate + MPCA ester had the lowest yield of 1930 lb A<sup>-1</sup> compared to 2420 lb A<sup>-1</sup> for the nontreated control.

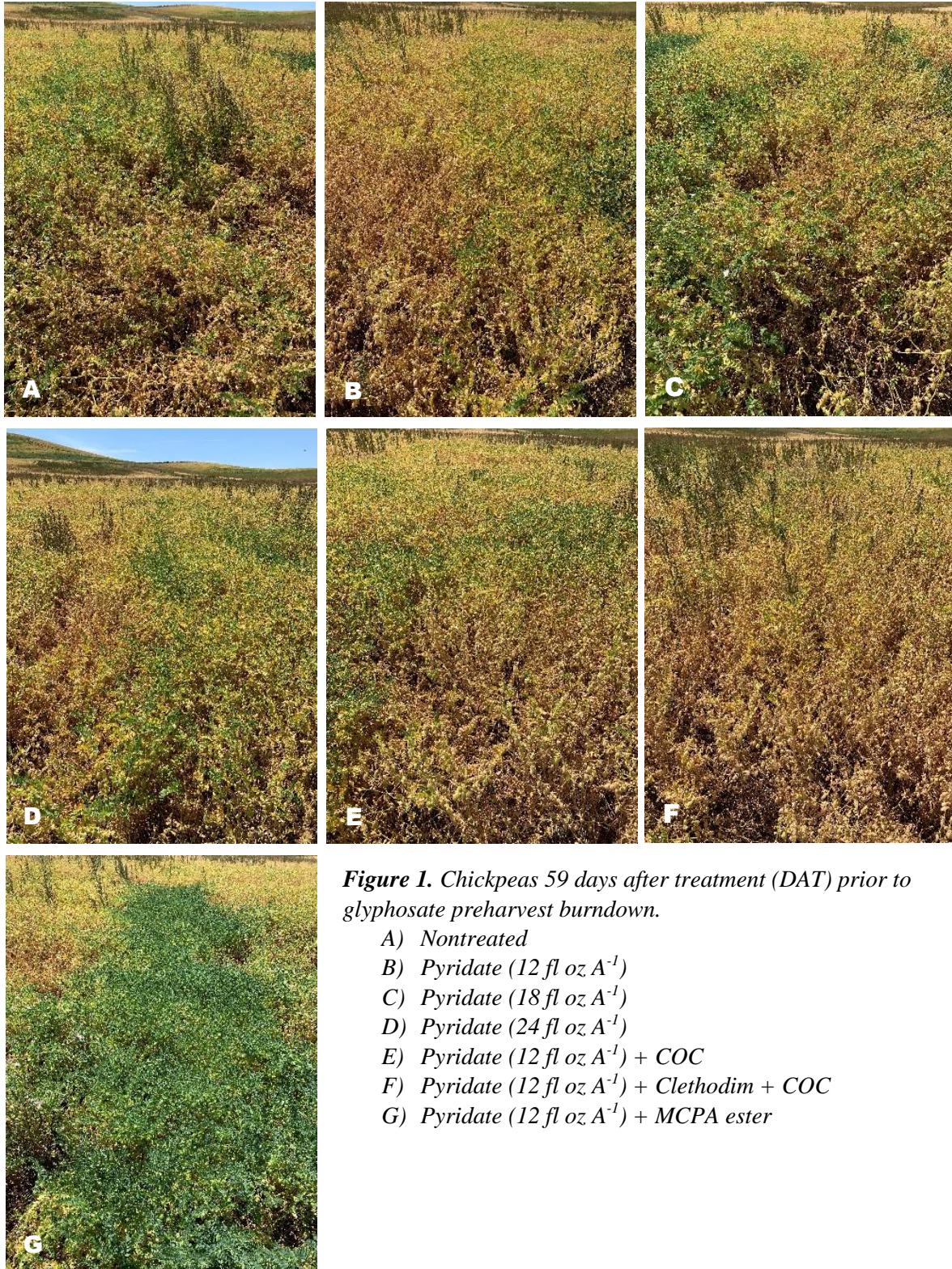
MCPA ester is not labeled for postemergence use in chickpeas and is not an effective treatment due to crop injury, although it did control the common lambsquarters.

Pyridate is an effective herbicide for postemergence broadleaf weed control in chickpeas, offering both efficiency and crop tolerance alone (with either NIS or COC) or in combination with a grass herbicide such as clethodim. Pyridate will likely reduce or eliminate the need for a preharvest treatment to manage weeds.

**Table 2.** Percent crop necrosis, crop epinasty, common lambsquarters (CHEAL) control, and crop drydown, and yield following postemergence treatments of pyridate in chickpeas. Pullman, WA, 2019. Means followed by the same letter are not significantly different ( $\alpha=0.05$ ).

Treatment <sup>1</sup>	Application Timing	Field Rate	lb ai/A	June 18, 2019 (2 DAT)		August 14, 2019 (59 DAT)		September 5, 2019
				Crop Necrosis	Crop Epinasty	CHEAL Control	Crop Drydown	Yield
				%	%	%	%	lb A <sup>-1</sup>
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Pyridate	POST	12 fl oz/A	0.470	0 b	0 b	93	70 a	2550
NIS	POST	0.25% v/v						
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Pyridate	POST	18 fl oz/A	0.700	4 a	0 b	87	73 a	2120
NIS	POS	0.25% v/v						
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Pyridate	POST	24 fl oz/A	0.940	0 b	0 b	94	74 a	2040
NIS	POST	0.25% v/v						
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Pyridate	POST	12 fl oz/A	0.470	1 b	0 b	72	78 a	2640
Clethodim 2EC	POST	16 fl oz/A	0.250					
COC	POST	1% v/v						
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Pyridate	POST	12 fl oz/A	0.470	0 b	0 b	92	85 a	2410
COC	POST	1% v/v						
Outlook	PRE	21 fl oz/A	0.980					
Spartan	PRE	4.5 fl oz/A	0.140					
Pyridate	POST	12 fl oz/A	0.470	0 b	50 a	99	20 b	1930
MCPA ester	POST	4.32 fl oz/A	0.125					
NIS	POST	0.25% v/v						
<i>LSD</i>				<i>1.48</i>	<i>4.58</i>	<i>NS</i>	<i>18.33</i>	<i>NS</i>





**Figure 1.** Chickpeas 59 days after treatment (DAT) prior to glyphosate preharvest burndown.

- A) Nontreated
- B) Pyridate (12 fl oz A<sup>-1</sup>)
- C) Pyridate (18 fl oz A<sup>-1</sup>)
- D) Pyridate (24 fl oz A<sup>-1</sup>)
- E) Pyridate (12 fl oz A<sup>-1</sup>) + COC
- F) Pyridate (12 fl oz A<sup>-1</sup>) + Clethodim + COC
- G) Pyridate (12 fl oz A<sup>-1</sup>) + MCPA ester

## **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.**