Tough Efficacy on Common Lambsquarters

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In spring 2023, an herbicide trial was established south of Pullman, WA on Spillman Farm to determine the efficacy of Tough 5EC (pyridate) on common lambsquarters (*Chenopodium album*). Three different rates of Tough were applied with three different carrier volumes – 10, 15, and 20 gallons per acre.

The study was conducted on crop-free ground that was infested with common lambsquarters near Pullman, WA. Treatments were applied when the common lambsquarters was 6-8 inches tall and was actively growing in spring 2023. Treatments were applied with a CO_2 powered backpack sprayer and a 5 ft boom with 3 Teejet nozzles (80015VS, 8002VS, 8003VS) with an effective spray pattern of 8 ft and calibrated to deliver 10, 15, or 20 gallons per acre (GPA), respectively. The study was conducted in a randomized complete block design with 3 replications. Plots were 10 ft by 30 ft long. Treatments were assessed for weed control at 7, 10, and 18 days after treatment. Data were subject to ANOVA using the Agricultural Research Manager software (Ver. 2023).

Table 1. *Treatment application details*

Study Application	
Date	6/5/2023
Application volume (GPA)	10, 15, and 20
Timing	Postemergence
Weed Stage	6-8”
Air temperature (˚F)	63
Wind velocity (mph, direction)	5, E
Cloud Cover (%)	40

Figure 1. Weed control examples with Tough 5EC at 24 oz/A, 10 GPA (left) and Tough 5EC at 12 oz/A, 20 GPA (right), taken 6/15/2023.

Results

Common lambsquarters control with Tough 5EC was variable. Carrier volume appeared to have little effect on weed control, although there was slightly better control in the treatments applied at 10 GPA (Table 2). However, weed control increased with increasing rates of Tough, with 18 and 24 oz/A resulting in the highest weed control among the different carrier volumes. Tough applied at 24 oz/A and 10 GPA provided the most effective common lambsquarters control throughout the rating period, though control ranged between 60 and 80%. The control observed at the lower carrier volume is likely associated with droplet size, where 10 GPA and the 80015VS tip resulted in a fine spray droplet pattern. Higher carrier volumes have larger droplet size patterns. The treatments were applied to larger than recommended common lambsquarters, which was 6-8 inches tall. Applications should be timed to when the common lambsquarters have no more than 4 leaves and are actively growing. Results also confirmed previous research conducted in 2016 (smallgrains.wsu.edu/uploads/2013/11/Completed-ICB2716-Report.pdf), where lower carrier volume resulted in higher numerical weed control with pyridate. Previous work did not include increasing rates presented here. Continued research with Tough in chickpea is critical to identify the most effective rate, carrier volume and resulting droplet size, and timing of application that results in consistent control of common lambsquarters.

Table 2. Weed control ratings in response to increasing doses and application volumes of Tough 5EC near Pullman, WA in 2023. Means with the same letter are not statistically different (α=0.5).

			Control (%)	Control (%)	Control (%)
Treatment[1]	**GPA**	**Rate**	**6/12/2023**	**6/15/2023**	**6/23/2023**
Tough 5EC	10	12 oz/A	17 bc	6 b	6 bc
Tough 5EC	10	18 oz/A	50 b	40 b	43 ab
Tough 5EC	10	24 oz/A	83 a	73 a	67 a
Tough 5EC	15	12 oz/A	3 bc	3 b	3 c
Tough 5EC	15	18 oz/A	10 bc	7 b	7 bc
Tough 5EC	15	24 oz/A	40 bc	30 b	43 ab
Tough 5EC	20	12 oz/A	30 bc	23 b	24 bc
Tough 5EC	20	18 oz/A	20 bc	20 b	20 bc
Tough 5EC	20	24 oz/A	30 bc	23 b	23 bc

[1] All treatments included MVO at 1% ai/v.

Off-label or Experimental-Use Disclaimer

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