WATERHEMP CONTROL IN SMALL GRAIN STUBBLE

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Introduction

Waterhemp is troublesome weed that can begin emerging in May and continue to emerge through early August (Hartzler et al. 1999). Many producers have expressed concern about controlling waterhemp after small grains have been harvested.

Objective

The objective of this experiment was to evaluate waterhemp control in small grain stubble.

Materials and Methods

The experiment was conducted in wheat stubble on natural waterhemp populations near Hickson, ND in 2020. Experimental area consisted of a uniform infestation of waterhemp ranging from newly emerged to 12 inches tall.

Herbicide treatments were applied on August 8 and September 2, 2020 with a bicycle wheel sprayer in 17 gpa spray solution through 8002 XR flat fan nozzles pressurized with CO_2 at 43 psi. Treatment list can be found in Table 1.

Table 1. Herbicide treatments and rates in trial near Hickson, ND in 2020.

Herbicide Treatment	Rate (fl oz/A)
RoundUp PowerMax[1]	32
RoundUp PowerMax + Weedar 64[1]	32 + 64
RoundUp PowerMax + Sharpen[2]	32 + 1
RoundUp PowerMax + Sharpen[2]	32 + 2
RoundUp PowerMax + Sharpen + Valor SX[2]	32 + 1 + 1
RoundUp PowerMax + Sharpen + Valor SX[2]	32 + 1 + 2
RoundUp PowerMax / RoundUp PowerMax[1]	32 / 32
RoundUp PowerMax + Weedar 64 /	32 + 64 /
RoundUp PowerMax + Weedar 64[1]	32 + 64

[1]Treatment applied with Prefer 90 NIS at 0.25 % v/v + NPak AMS at 2.5% v/v.
[2]Sharpen and Valor SX applied with methylated seed oil at 1.5 pt/A + NPak AMS at 2.5% v/v.

Waterhemp control were evaluated visually, beginning approximately six days after the first herbicide application was made and continued on a generally weekly interval for three weeks. All evaluations were a visual estimate of control in the treated area compared to the adjacent untreated strip. Experimental design was randomized complete block with 4 replications. Data were analyzed with the ANOVA procedure of ARM, version 2019.4 software package.

Results

Waterhemp control ranged from 26 to 30% from a single glyphosate (RoundUp PowerMax) application at 32 fl oz/A and from 33 to 50% control from a two-spray glyphosate program (Table 2). One or two glyphosate applications did not provide acceptable control of a glyphosate-resistant waterhemp population. 2, 4-D (Weedar 64) at 64 fluid ounces per acre plus glyphosate improved waterhemp control compared to glyphosate alone. Control ranged from 64 to 88% control from a single application and from 63 to 78% from repeat applications. There was no statistical difference between a single or repeat applications of 2, 4-D plus glyphosate.

Sharpen at 1 or 2 fl oz plus glyphosate provided greater than 89% waterhemp control. There was no observable benefit from increasing the Sharpen rate from one to two fluid ounces/A. Sharpen plus glyphosate were applied with N-Pak and MSO (methylated seed oil) to maximize Sharpen performance. Valor SX plus Sharpen plus RoundUp PowerMax provided the best numerical control of waterhemp and there was no difference in control between Valor SX at 1 versus 2 oz/A. Likewise, there was no significant difference in waterhemp control between Sharpen plus RoundUp PowerMax and Sharpen plus Valor SX plus RoundUp PowerMax.

Table 2. Percent visual waterhemp control by treatment and evaluation date near Hickson, ND in 2020.

		Waterhemp Control		
Treatment	Rate	6 DAT[3]	15 DAT	22 DAT
	--fl oz/A--	----------%----------		
RoundUp PowerMax[1]	32	26 c	30 c	28 d
RoundUp PowerMax + Weedar 64[1]	32 + 64	64 b	73 b	88 ab
RoundUp PowerMax + Sharpen[2]	32 + 1	90 a	91 a	98 a
RoundUp PowerMax + Sharpen[2]	32 + 2	89 a	90 a	98 a
RoundUp PowerMax + Sharpen + Valor SX[2]	32 + 1 + 1	99 a	99 a	98 a
RoundUp PowerMax + Sharpen + Valor SX[2]	32 + 1 + 2	97 a	100 a	100 a
RoundUp PowerMax / RoundUp PowerMax[1]	32 / 32	33 c	40 c	50 c
RoundUp PowerMax + Weedar 64 / RoundUp PowerMax + Weedar 64[1]	32 + 64 / 32 + 64	63 b	65 b	78 b
LSD (0.05)		**13**	**13**	**11**

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[2]Sharpen and Valor SX applied with methylated seed oil at 1.5 pt/A + NPak AMS at 2.5% v/v.
[3]DAT=Days after treatment.

Conclusion

The previous recommendation to control waterhemp in small grain stubble was 2,4-D at 32 fl oz/A (esther or amine depending on nearby crops) plus RoundUp PowerMax. This recommendation was statistically similar to Sharpen at 1 fl oz/A plus RoundUp PowerMax 22 DAT (days after treatment) but numerically provided waterhemp control 10% less than Sharpen plus RoundUp PowerMax. These results suggest the new recommendation should be Sharpen at 1 fl oz/A plus RoundUp PowerMax at 32 fl oz/A for waterhemp control.

References

Hartzler RG, Buhler DD, Stoltenberg DE (1999) Emergence characteristics of four annual weed species. Weed Science Society of America. 47(5):578-584