Evaluation of Herbicides for Common Purslane Control in Turfgass

Turf Science

Christopher A. Proctor, Roch E. Gaussoin, and Zachary J. Reicher

Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE

University of Nebraska Lincoln

Introduction

Common purslane (*Portulaca oleracea* L.) is a summer annual weed that is problematic in thin turf, bare soil, or during establishment. Numerous herbicides are labeled for control of purslane in turfgrass, yet minimal published research exists evaluating postemergence (POST) and preemergence (PRE) herbicide effectiveness in turfgrass. During the 2011 and 2012 growing seasons, preemergence and postemergence herbicide studies were conducted at the UNL John Seaton Anderson research facility near Mead, NE.

Objective: Determine the efficacy of PRE and POST herbicides labeled for turf to control purslane.

Analysis: Both studies were randomized complete block designs with 3 replications. Analysis of variance was performed using PROC GLIMMIX in SAS. Mean separation using Fisher's LSD at $P \leq 0.05$.

Postemergence study

Materials and Methods

- Experiments conducted 2011 (POST2011) and 2012 (POST2012)
- Plot areas tilled early spring to control winter annuals and encourage purslane growth
- Twenty-five postemergence herbicides (Table 1) applied on 15 June 2011 and 4 June 2012 at the high label rate to mature purslane (main stem >10 cm)
- Isoxaben applied over herbicide treatments and treated control plots 1 day after POST treatment to prevent new purslane emergence
- Percent visual cover rated at 1, 2, 3, and 4 weeks after treatment (WAT)

Results

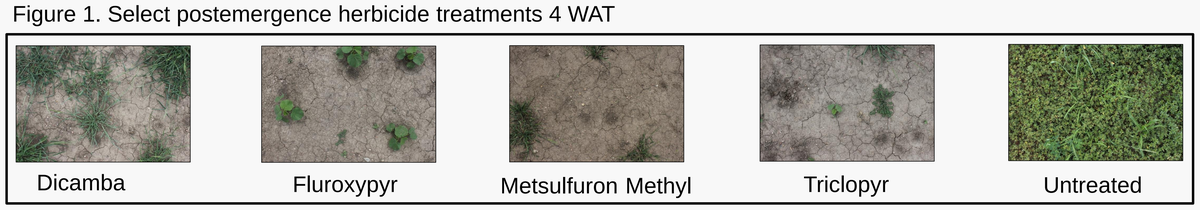
- Dicamba, fluroxypry, metsulfuron methyl, and triclopyr consistently resulted in lowest purslane cover across years (Table 1)(Fig.1)
- Eleven out of 25 herbicides resulted in ≤ 18% purslane cover 4 WAT in 2011(Table 1)
- Four out of 25 herbicides resulted in ≤ 17% purslane cover 4 WAT in 2012 (Table1)
- Purslane maturity at herbicide application may have contributed to control differences between years
- Despite an earlier application date in 2012 than 2011, above average early season temperatures in 2012 resulted in more purslane cover at time of application

Table 1. Percent purslane cover by experiment following postemergence herbicide treatments

	POST2011				POST2012			
Herbicide	1 WAT[z]	2 WAT	3 WAT	4 WAT	1 WAT	2 WAT	3 WAT	4 WAT
	----------% cover----------							
Fluroxypyr	1	0	0	0	50	20	1	0
Metsulfuron methyl + NIS[x]	8	0	0	0	92	40	4	0
Triclopyr	4	0	0	0	53	22	4	0
Dicamba	17	1	1	1	78	63	50	17
Glyphosate	1	0	1	1	63	53	18	20
MCPA	21	1	1	1	67	73	67	60
Glufosinate	1	0	0	2	62	60	76	88
Flazasulfuron +NIS	6	1	3	7	85	87	96	93
Aminocyclopyrachlor	45	28	17	10	91	96	75	83
Clopyralid	45	33	23	12	92	98	95	83
Ethofumesate	17	2	4	15	87	82	83	89
Carfentrazone	2	4	13	25	80	93	98	93
2,4-D	33	17	22	33	78	83	82	83
Formasulfuron +MSO[y]	27	17	33	58	83	85	95	92
Diquat dibromide + NIS	8	15	47	58	73	97	99	93
Sulfentrazone	11	18	47	62	87	99	98	97
Sulfosulfuron +NIS	25	22	60	68	80	95	95	84
Simazine	37	37	80	87	78	87	83	60
Dithiopyr	28	32	62	77	91	97	99	98
Pyraflufen ethyl	12	27	67	80	91	97	99	97
Penoxsulam	32	47	73	92	72	88	94	77
Quinclorac + MSO	45	67	88	93	90	95	99	94
MSMA +NIS	68	88	95	97	80	92	97	93
Mesotrione +NIS	70	80	95	98	92	97	98	99
Fenoxaprop-P-ethyl	50	73	88	91	90	97	99	100
Control	67	87	97	95	92	97	97	97
LSD[w]	21	17	21	18	15	13	20	17

[z] WAT, weeks after treatment
[y] MSO, methylated seed oil
[x] NIS, non-ionic surfactant
[w] LSD, least significant difference. Mean separation by Fisher's LSD at $P \leq 0.05$

Figure 1. Select postemergence herbicide treatments 4 WAT



Preemergence study

Materials and Methods

- Experiments conducted 2011 (PRE2011) and twice in 2012 (PRE2012a) and (PRE2012b)
- Plot areas tilled July prior to treatment application to encourage purslane growth and seed production
- Plot area seeded the preceding September with perennial ryegrass (*Lolium perenne*)
- Nine preemergence herbicides(Table 2) applied at one-half maximum and maximum labeled rates on 20 April 2011, 24 March and 24 April 2012
- Prior to purslane emergence and 7 days after PRE application, perennial ryegrass was sprayed with glyphosate to reduce competition and encourage purslane
- Plots were rated for visual percent purslane cover at 6, 8, 10, and 12 WAT

Results

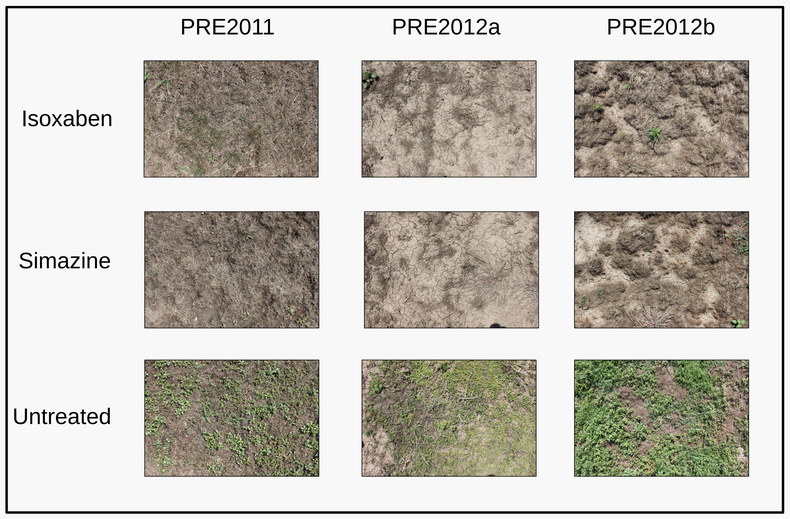
- There was no rate by herbicide interaction, therefore only herbicide effects shown
- No difference in purslane cover 6 WAT (data not shown)
- For all three experiments isoxaben and simizine always grouped with treatments providing lowest purslane cover (Table 2) (Fig. 2)
- In PRE2012a, ethofumesate, pendimethalin, prodiamine, and siduron were also among treatments with lowest purslane cover 10 WAT (Table 2)
- In PRE2012b, prodamine also grouped with treatments resulting in lowest cover at 8, 10, and 12 WAT (Table 2)

Table 2. Percent purslane cover by experiment following preemergence herbicide treatments

	PRE2011			PRE2012a			PRE2012b		
Herbicide	8 WAT[z]	10 WAT	12 WAT	8 WAT	10 WAT	12 WAT	8 WAT	10 WAT	12 WAT
	----------%cover----------								
Isoxaben	1[y]	3	13	2	7	31	1	9	6
Simazine	1	1	28	3	11	48	1	4	3
Prodiamine	26	23	34	2	6	37	4	17	19
Ethofumesate	43	7	17	3	15	37	19	60	51
Siduron	19	37	64	0	3	39	19	53	51
Dimethenamid	46	14	28	5	32	55	17	50	44
Pendimethalin	42	22	39	2	12	47	12	47	46
Dithiopyr	28	37	53	5	26	47	18	49	47
Mesotrione	43	11	18	6	30	54	23	69	66
LSD[x]	13	11	12	NS	21	NS	10	30	26
Untreated[w]	53	22	29	5	14	30	28	48	27

[z] WAT, weeks after treatment
[y] Means of 2 herbicide rates and 3 replications
[x] LSD, least significant difference. Mean separation by Fisher's LSD at $P \leq 0.05$
[w] Untreated means were not included in analysis and presented for reference only

Figure 2. Select preemergence herbicide treatments 8 WAT



Summary

- **Purslane competes with turfgrass during establishment, in hard to manage areas, or thin turf stands**
- **Most effective postemergence herbicides for controlling purslane were consistently dicamba, fluroxypyr, metsulfuron methyl, and triclopyr**
- **Purslane maturity at application may affect postemergence herbicide control**
- **For preemergence control , isoxaben and simazine were consistently most effective**
- **Combining preemergence followed by postemergence herbicide applications could provide extended purslane control**

Author e-mail: caproctor@huskers.unl.edu

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